

Crookwell 2 Wind Farm Section 75W Modification Application Response to Submissions

On behalf of
Crookwell Development Pty Ltd
June 2017



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This document is for discussion purposes only unless signed and dated by the persons identified. This document has been reviewed by the Project Director.

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1 Introduction

This Environmental Assessment and Submissions Report (Report) has been prepared in response to the submissions received following the public exhibition of the Environmental Assessment (EA) (dated September 2016) for the proposed Modification 2 to the Crookwell 2 Wind Farm project.

Modification 2 includes a proposed:

- reduction in the number of turbines from the currently approved 46 turbines to a total of 33 turbines;
- an increase in the approved maximum turbine envelope so as to accommodate the newer, more efficient turbine models now available; and
- other clarifications to the project layout as set out in this Report.

Modification 2 is subject to section 75W of the *Environmental Planning and Assessment Act 1979* (EP&A Act), which continues to apply to the project in accordance with schedule 6A of the EP&A Act.

The EA was publicly exhibited from 11 October to 14 November 2016.

The publicly exhibited EA received a total of 62 submissions, including 48 submissions from individuals, 5 submissions from groups/organisations, and 9 submissions from government agencies. The details of the submissions are set out in section 5 of this Report.

1.1 Purpose of Report

This Report:

- responds to the matters raised in the submissions; and
- sets out and assesses some additional clarifications to the project layout which have been made to address the issues raised in submissions and as a result of further detailed design of the project.

1.2 Structure of Report

In consideration of the community submissions and government agency comments to the publicly exhibited EA, this Report has been structured as follows:

- site description;
- design changes and amendments to the proposed development and infrastructure;
- overview of consultation process and submissions;
- response to submissions; and
- summary of specialist reports prepared in response to submissions.

2 Site Description

Crookwell is located in regional southwest NSW in the Upper Lachlan Local Government Area. The Crookwell 2 Wind Farm is one of three approved/proposed wind farms in the Crookwell region, the other farms being the operational Crookwell 1 Wind Farm and the proposed Crookwell 3 Wind Farm.

The site is located on Crookwell Road, approximately 14km south-east of Crookwell and 30km north-west of Goulburn. Figure 1 and Figure 2 provide aerial views of the site, and Table 3 provides a summary description of the site.



Figure 1: Regional Context
Source: Mecone 2016

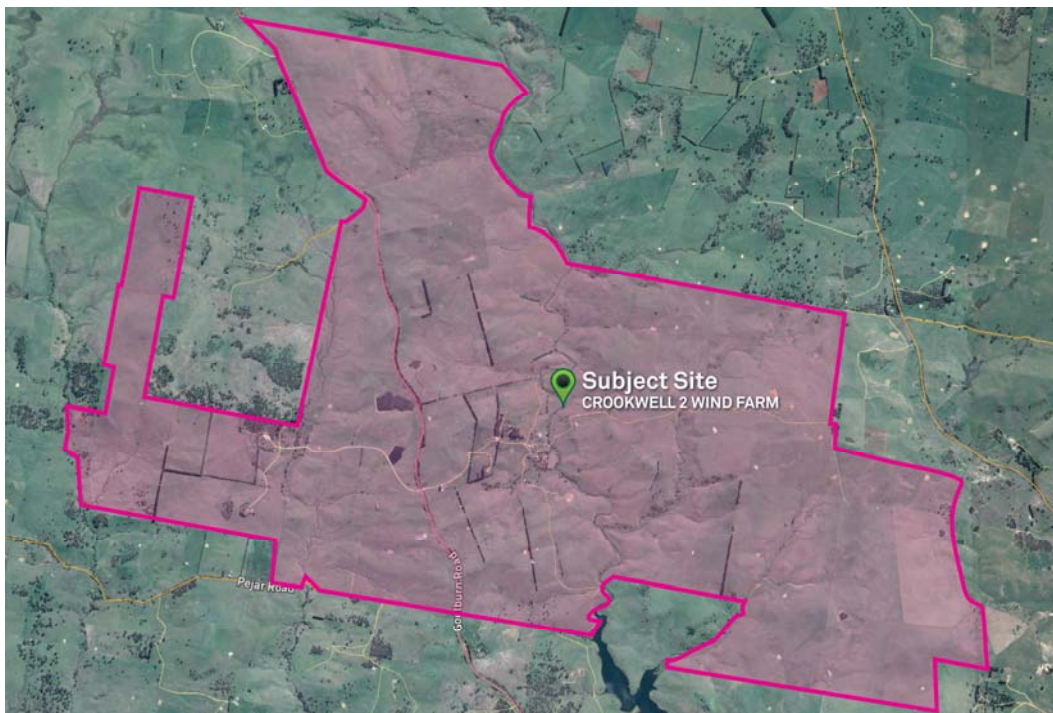


Figure 2: Site Location
Source: Mecone 2016

Table 1. Site Description	
Item	Description
Legal Description	<p>Lot 91 DP 750042</p> <p>Lot 140 DP 750042</p> <p>Lot 1 DP 1201348</p> <p>Lot 2 DP 1201348</p> <p>Lot 3 DP 1201348</p> <p>Lot 41 DP 999621</p> <p>Lot 2 DP 865814</p> <p>Lot 2 DP 1091383</p> <p>Lot 1 DP 79580</p> <p>Lot 18 DP 252214</p> <p>Lot 1 DP 1087717</p> <p>Lot 2 DP 1087717</p> <p>Lot 3 DP 1087717</p> <p>Lot 1 DP 965855</p> <p>Right of Carriageway over Lot 18 DP252214 Conveyance No. 622, Book 337.</p> <p>The project site also includes the unformed crown road reserves located within the above property titles and the roads which are required to be upgraded by the development consent conditions.</p>
Total Area	Approximately 2,088 hectares
Location	Access to the Crookwell 2 Wind Farm is via Crookwell Road and Woodhouselee Road.
Site Description	The site is located on a system of ridges and low hills that are separated by the Wollondilly River and the Goulburn-Crookwell Road corridor.
Surrounding Context	The surrounding area is rural in character and features undulating hills with some steeper slopes around valleys.

3 Current Status of the Project

The original Development Consent for the Crookwell 2 Wind Farm was granted in June 2005 as State significant development under section 80 of the EP&A Act.

Crookwell Development Pty Ltd (CDPL), as the proponent for the Crookwell 2 Wind Farm, was granted approval for the Pre-Construction Compliance Report and Construction Environmental Management Plan (CEMP) Stage-1 in June 2009 and immediately commenced construction of the approved 92 MW project under the Development Consent with the start of surveying and geotechnical investigations for various sections of the site. Bulk earthworks were also undertaken involving excavation and compacting of an area 50m x 100m, constructing a hardstand area, installing steel reinforcement and pouring a concrete slab of 25m x 25m. In addition, portable buildings were installed, a bund for a generator constructed, generator installed, water tank installed, plumbing and electrical fitouts undertaken, and security fencing for the entire perimeter of the site compound erected.

The Development Consent was subsequently modified in July 2009 under approved Modification 1.

In June 2009, a Works Authorisation Deed (WAD) was signed and executed between CDPL and Roads and Maritime Services (RMS) [previously called Roads and Traffic Authority] for the works relating to the two access road entrances on Crookwell Road and the intersection of Crookwell Road and Woodhouselee Road south of the Site. A third site road entrance access is via Woodhouselee Road, which is a council road under jurisdiction of Upper Lachlan Shire Council (ULSC). The detailed design process was undertaken in liaison with RMS and ULSC.

The RMS Road Occupancy Licence (ROL) was issued on 20th June 2012, the designs were approved by ULSC on 9th July 2012, and construction certificate was granted for the road upgrade works on 31st July 2012 followed by the commencement of construction of the public road upgrade activities on 24th September 2012. The relevant road upgrade construction activities were completed on 5th March 2013.

Construction works have now re-commenced with construction of the project currently in progress under the existing approved project layout.

If Modification 2 is approved, the proponent will update the approved construction environmental management plan and other the approved relevant plans and strategies required under the consent conditions within 3 months of the modification being approved.

4 Proposed Modification 2

The environmental assessment report prepared for proposed modification 2 to the Crookwell 2 Wind Farm, as submitted in September 2016 (EA), outlined the modifications sought as follows:

- Reduction of the number of approved turbines from 46 to 33 (a total reduction of 13 turbines);
- Increase in the maximum turbine envelope so as to accommodate the newer more efficient turbine models now available. The changes proposed to the turbine envelope will:
 - Increase in the hub height from 80m to up to 95m;
 - Increase in the blade size from 47m to up to 64m;
 - Increase in the rotor diameter from 96m to up to 130m;
 - Increase in the blade tip height from 128m to up to 160m; and
 - Increase in turbine foundation area from 17m in diameter to approximately 20m in diameter and to a depth of approximately 3m;
- Inclusion of a 50m micro-siting allowance, which allows for the micro-siting of turbines and associated project infrastructure by up to 50m from the locations approved in Modification 1;
- Modifications to the obstacle night lighting design to match the turbine layout;
- Grid cut-in reconfiguration and inclusion of a taller replacement transmission line tower for TransGrid, and associated communications infrastructure; and
- Subdivision of the approved switchyard and any deemed subdivision arising from the grant of leases for the wind farm.

Modification 2 has now been updated to address the issues raised in submissions and as a result of further detailed design of the project. This Report accordingly clarifies the project layout further by:

- removing wind turbine F9, resulting in a total of up to 32 turbines for the Crookwell 2 Wind Farm (a total reduction of 14 turbines from the approved project); and
- several realignments to approved access track (including the provision of alternative alignments for some access track sections) and cabling locations to accommodate the reduced turbine layout, further minimise impacts on Aboriginal heritage items and optimise the infrastructure footprint by reducing overall disturbance.
- The removal of 14 approved turbines and associated access tracks and crane hardstand platforms, along with optimisation of the substation configuration and realignment of access tracks and cabling would reduce the disturbance footprint by approximately 7 hectares. This would be offset to some extent by the larger turbine foundations and hardstand areas and 6 metres wide permanent access track envelope, with the overall disturbance footprint reducing from 32 to 27 hectares.

The amended Site Infrastructure Layout Plan is provided at Figure 3 below which incorporates these additional clarifications. This plan remains subject to the proposed 50m micro-siting allowance which is required to allow for further detailed design as construction of the project progresses.

In addition, this Report also:

- Corrects the references to dwelling R124. This structure has been verified by Green Bean Design and the Department of Planning and Environment as an agricultural shed and is accordingly not a residential dwelling.
- Includes and assesses the impacts of proposed modification 2 on:
 1. dwelling R1A, which has been confirmed as a DA-approved shed conversion and is accordingly a residential dwelling;
 2. dwelling R134, which appears to be of recent construction; and
 3. dwelling R134A, which has recently been approved for construction (but is not yet constructed).

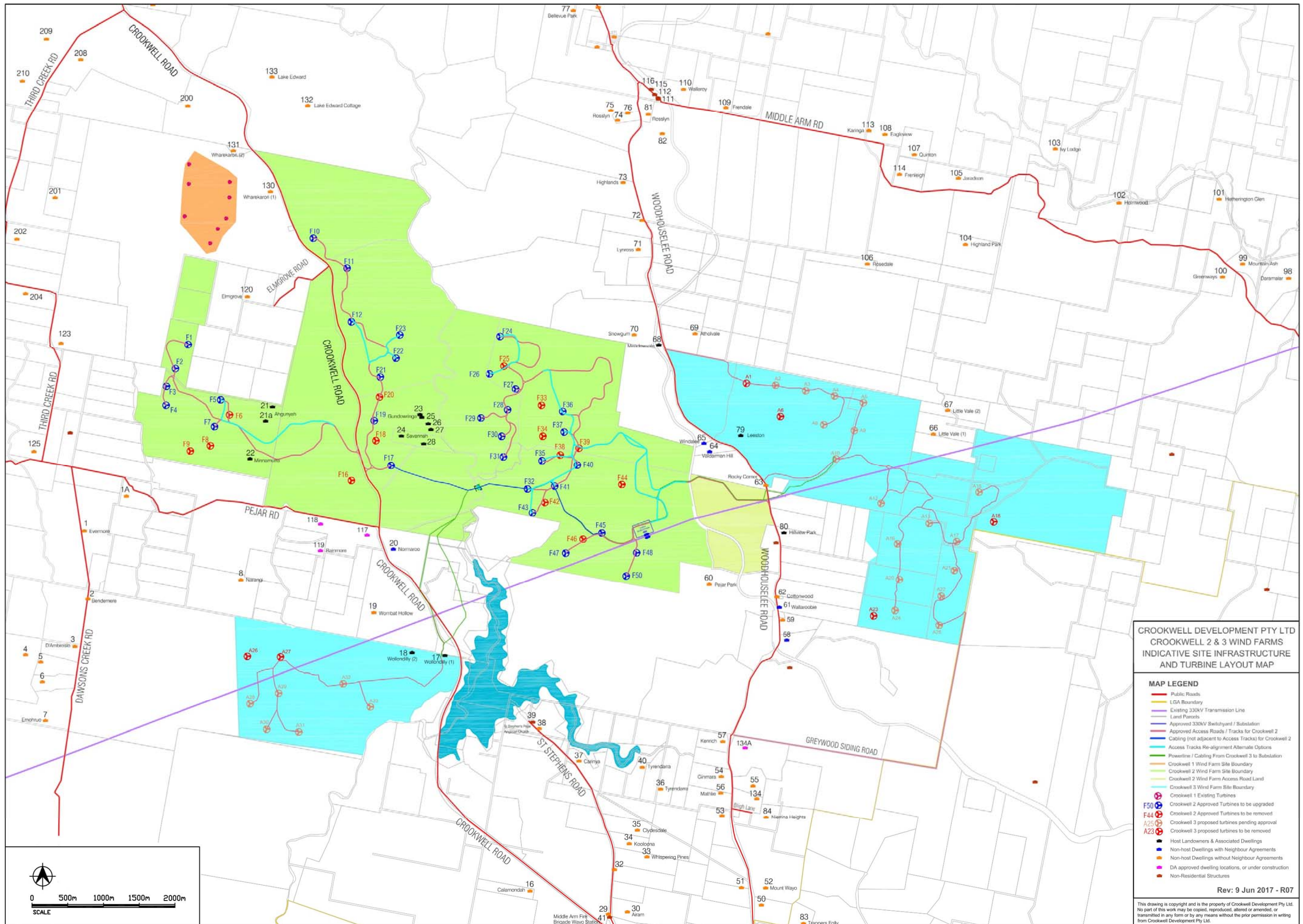


Figure 3: Site Infrastructure Map
Source: Crookwell Development Pty Ltd

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5 Consultation

5.1 Overview of Consultation for Modification 2

The EA for the Modification 2 application was publicly exhibited from 11 October to 14 November 2016.

Notification of the exhibition was provided in local publications the Goulburn Post, Crookwell Gazette and Post Weekly. Letters were sent to all adjoining and nearby landowners notifying of the exhibition and inviting a submission.

The EA was also made available on the Department of Planning and Environment, and the proponent's websites, and hard copies were available for viewing at the following locations:

- Department of Planning and Environment, Level 22, 320 Pitt Street, Sydney;
- Upper Lachlan Shire Council (Crookwell office), 44 Spring Street, Crookwell;
- Upper Lachlan Shire Council (Gunning Office), 123 Yass Street, Gunning;
- Goulburn Mulwaree Council (Civic Centre), 184-194 Bourke Street, Goulburn;
- Crookwell Library, Denison Street, Crookwell; and
- Nature Conservation Council, Level 14, 338 Pitt Street, Sydney.

In addition, community and stakeholder engagement was conducted with the following stakeholders:

- Commonwealth Agencies:
 - Civil Aviation Safety Authority (CASA) [in relation to Aviation impact, Telecommunication impact];
 - Airservices Australia [in relation to aviation impact, telecommunication impact];
 - Department of Defence [in relation to aviation impact, telecommunication impact];
 - Department of Environment, online Environmental Protection and Biodiversity Conservation Act 1999 (EPBC Act) Protected Matters Search Tool [in relation to ecology impact];
 - Bureau of Meteorology (BoM) [in relation to telecommunication impact];
- NSW Government Agencies:
 - NSW Department of Planning and Environment [in relation to planning and assessment provisions, noise impact, visual impact, socio-economic benefits (including Voluntary Planning Agreement, Neighbour Benefit Sharing Scheme)];
 - NSW Office of Environment and Heritage, including Schedule 1 to the NSW Threatened Species Conservation (TSC) Act 1995 [in relation to ecology impact, heritage impact];
 - NSW Environmental Protection Authority [for Noise impact];
 - NSW Department of Industry [for Regional investment, Socio-Economic benefits (including Voluntary Planning Agreement, Neighbour Benefit Sharing Scheme)];
 - NSW Department of Industry, Crown Roads [in relation to traffic impact, crown road crossing licencing];
 - NSW Land and Property Information (NSW LPI) [in relation to telecommunication impact];

- NSW Roads and Maritime Services [in relation to traffic impact];
- NSW Office of Water, Sydney Catchment Authority / Southern Rivers Catchment Management Authority [in relation to watercourse crossing licencing];
- NSW Rural Fire Service [in relation to telecommunication impact, aviation impact];
- Ambulance Service of NSW [in relation to telecommunication impact];
- John Holland Rail on behalf of Transport for NSW [in relation to traffic impact, unused rail corridor access licencing];
- Local Government:
 - Upper Lachlan Shire Council [in relation to planning provisions, aviation impact, traffic impact, telecommunication impact, socio-economic benefits (including Voluntary Planning Agreement, Neighbour Benefit Sharing Scheme)];
 - Goulburn Mulwaree Council [in relation to traffic impact, aviation impact];
- Other Agencies / Organisations:
 - Aerial Agricultural Association of Australia [in relation to aviation impact];
 - Fred Fahey Aerial Services [for aviation impact];
 - Geoscience Australia [for telecommunication impact];
 - Mobile phone service providers (Optus, Telstra and Vodafone) [in relation to telecommunication impact];
 - Radio Goulburn (in relation to telecommunication impact);
 - Royal Flying Doctor Service [in relation to aviation impact];
 - Vertical Telecoms [in relation to telecommunication impact];
 - Wireless Internet (NBN, Yless4U, ACE Internet Services) [in relation to telecommunication impact];
 - Yass Aerial Service [in relation to aviation impact];
- Associated residents where modified turbines are located on their land:
 - Host landowners [in relation to proposed changes to the project, planning provisions and amendment process, socio-economic benefits (including Voluntary Planning Agreement, Neighbour Benefit Sharing Scheme)]; and
- Non-associated landowners / residents and the local community:
 - Newspaper advertisement for the door-knock consultation process was placed in the Crookwell Gazette, Goulburn Post and Post Weekly, and the subsequent door-knock process was undertaken on 16th, 17th, 18th of December 2015. With several follow up meetings and telephone correspondence in early 2016.
 - The consultation process for the neighbouring landowners, residents, local community groups and individuals was in relation to proposed changes to the approved project, planning provisions and amendment process, visual impact, noise impact, traffic impact, telecommunication impact, decommissioning provisions, socio-economic benefits (including Voluntary Planning Agreement, Neighbour Benefit Sharing Scheme).

Additional consultation was carried out with interested landowners in regards to the voluntary Neighbour Benefit Sharing Agreement (Neighbour Deed).

5.2 Summary of Submissions Received

The Department of Planning and Environment received 62 total submissions during public exhibition of the EA:

- 9 submissions from government agencies:
 - Civil Aviation Safety Authority (CASA)
 - Goulburn Mulwaree Council (GMC)
 - NSW Department of Industry – Resources and Energy (DoI);
 - NSW Department of Primary Industries (DPI);
 - NSW Environmental Protection Authority (EPA);
 - NSW Office of Environment and Heritage (OEH);
 - NSW Roads and Maritime Services (RMS);
 - Upper Lachlan Shire Council (ULSC); and
 - Water NSW.
- 5 submissions from groups/organisations, 4 of which supported the project and only 1 of which objected:
 - Australian Wind Alliance;
 - Industry Capability Network NSW;
 - Greens NSW;
 - Parkesbourne/Mummel Landscape Guardians Inc; and
 - Ryde Gladesville Climate Change Action Group.
- 48 submissions from individuals, 31 of which supported the project and 17 of which objected.

The following section provides responses to the submissions received.

6 Response to Government Authorities

A total of 8 submissions from government authorities were received during the public exhibition period. This section summarises the comments and recommendations made.

6.1 NSW Department of Primary Industries – Resources and Energy

The NSW Department of Primary Industries (DPI), Division of Resources and Energy, has no concerns regarding any resource sterilisation issues with the proposed modification to Crookwell 2 Wind Farm.

6.2 NSW Department of Primary Industries – Lands

The NSW Department of Primary Industries (DPI) provided a coordinated response from the NSW Department of Industry – Lands that now form a division of the broader Department and no longer within DPI. No particular issues were raised, but the following recommendations were provided.

Table 2. Response to NSW Department of Primary Industries	
Issue	Recommendation/Response
Erosion & Sediment Control	<p>Due to the increased disturbance area for footing construction the proponent should:</p> <ul style="list-style-type: none"> • Consider additional erosion and sediment controls during the detailed design phase; and • Revise and detail water demands and confirm an adequate water source prior to approval of project. <p><i>Response:</i></p> <p>If the proposed modification is approved, the existing Erosion and Sediment Control Plan (dated 17th August 2009 will be reviewed and revised (as required). The approved Construction Environmental Management Plan (CEMP) Stage-1 will also be revised (as required) within 3 months of the approval.</p>
Crown Public Roads	<p>Should the Crown Roads be required for use in relation to the project the proponent should consult with the Department of Industry – Lands on legal requirements.</p> <p><i>Response:</i></p> <p>This requirement is already reflected in the current consent conditions, and a licence for use and crossing of the Crown Road within the project site was granted in 2009, and renewed each year since.</p>
Conditions of Consent	<p>The following conditions of consent should be included in any approval of the modification:</p> <ul style="list-style-type: none"> • An Erosion and Sediment Control Plan should be developed in consultation with DPI Water prior to

Table 2. Response to NSW Department of Primary Industries	
Issue	Recommendation/Response
	<p>commencement of construction;</p> <ul style="list-style-type: none"> The design of waterway crossings for access roads and cable installations, and any associated instream works should be prepared in accordance with DPI Water's <i>Guidelines for Controlled Activities on Waterfront Land (2012)</i>; The proponent must obtain relevant licensing under the <i>Water Act 1912/Water Management Act 2000</i> before commencing any works which intercept or extract groundwater or surface water; and If rock anchoring is selected for wind tower foundations, a groundwater assessment should be undertaken and endorsed prior to construction. The assessment should assess the risk of impact on existing licensed groundwater users and groundwater dependent ecosystems and provide suitable mitigation measures. <p><i>Response:</i></p> <p>Each of these requirements, with the exception of the proposed new assessment if rock anchoring is proposed, are already reflected in the current consent conditions.</p>

6.3 NSW Environmental Protection Authority

The NSW Environmental Protection Authority (EPA) advised that an Environmental Protection Licence could be issued subject to conditions. These conditions are outlined in the table below, and a brief response has been provided. A more detailed response has been prepared by SLR (refer to Appendix 2).

Table 3. Response to NSW Environmental Protection Authority	
Issue	Recommendation/Response
Noise levels	<p>The proponent check and confirm the exact location of each identified receiver and quantify any resulting change to modelling noise levels.</p> <p><i>Response:</i></p> <p>The seven receiver locations with which the EPA took issue have been reviewed by SLR, and updated locations have been provided. In short, the review found that the updated locations result in noise impacts that are consistent, reduced or only marginally increased from the originally identified locations. For the location with the increased impact, the noise would still remain below the applicable noise limit.</p>
Mitigation	<p>The Department of Planning and Environment should confirm with the proponent that sector management, if needed as a noise mitigation measure is a viable technical and financial option.</p>

Table 3. Response to NSW Environmental Protection Authority	
Issue	Recommendation/Response
	<p>Response:</p> <p>The proponent has advised that the selected turbine supplier has performed a noise optimisation analysis to achieve noise compliance at all non-participating dwellings around the project area. This noise optimisation analysis includes noise modes, sector and wind speed condition management, which is set and controlled by the manufacturer through various control algorithm. The manufacturer has provided a noise guarantee for the noise compliance in accordance with the noise optimisation process. The contractual noise guarantee demonstrates the technical and financial viability of the advanced noise mitigation measures that will be provided by the manufacturer's turbines.</p>
Noise and blasting	<p>A number of conditions have been recommended in regards to noise and blasting.</p> <p><i>Response:</i></p> <p>The conditions have been reviewed by and agreed by the proponent.</p>

6.4 NSW Office of Environment and Heritage

The table below outlines the recommendations of the Office of Environment and Heritage (OEH) and offers a brief response. More detailed responses, prepared by Bowen Heritage Management and Brett Lane and Associates, are attached at Appendix 3 and Appendix 5, respectively.

In addition to the response to submissions letters, the following specialist reports have been prepared to satisfy OEH's recommendations:

- Aboriginal Cultural Heritage Assessment Report prepared by Bowen Heritage Management (Appendix 4);
- Vegetation Impact Assessment prepared by Brett Lane and Associates (Appendix 6);
- Bird and Bat Utilisation Survey Report prepared by Brett Lane and Associates (Appendix 7);
- Bird and Bat Adaptive Management Plan Risk Assessment prepared by Brett Lane and Associates (Appendix 8); and
- Bird and Bat Adaptive Management Plan prepared by Brent Lane and Associates (Appendix 9).

Table 4. Response to NSW Office of Environment and Heritage	
Issue	Recommendation/Response
Aboriginal cultural heritage	A map showing the location of the remaining turbines, cabling, lay down areas and access tracks in relation to the known archaeological sites is required.

Table 4. Response to NSW Office of Environment and Heritage	
Issue	Recommendation/Response
	<p><i>Response:</i></p> <p>Updated mapping is provided within the Aboriginal Cultural Heritage Assessment Report (refer to Appendix 4).</p>
	<p>Clarification is sought as to whether archaeological sites were actually impacted under previous permits.</p> <p><i>Response:</i></p> <p>The proponent implemented several mitigation measures under provisions of the AHIPs granted previously (refer to Appendix 3 for further details).</p>
	<p>Commencement of a new process of Aboriginal consultation.</p> <p><i>Response:</i></p> <p>Aboriginal consultation has now been conducted as outlined in the Aboriginal Cultural Heritage Assessment Report prepared by Bowen Heritage Management (refer to Appendix 4).</p>
	<p>Development of an Aboriginal Heritage Management Plan (AHMP) prior to construction.</p> <p><i>Response:</i></p> <p>The approved Construction Environmental Management Plan (CEMP) Stage-1 sub-plan 8 includes a high-level Heritage Management Plan (HMP) that is currently used for the construction phase. If the Modification 2 is approved, any future revision to the HMP will be done in consultation with OEH and relevant Aboriginal Stakeholders.</p>
Biodiversity	<p>Cary out s5A assessments of significance (7 part tests rather than the outed 8 part tests) for each species listed in Attachment B, that take into consideration the increase by 32% of the total wind farm RSA, the increase in the footprint of individual turbines, as well as the impact from the proposed microsite allowance of 100m diameter.</p> <p><i>Response:</i></p> <p>In consideration that the total RSA for the turbines will increase, most of this increase will be in heights above 50 metres, which is above the flight heights of typical species of farmland birds found in predominantly agricultural landscape such as at the project site. Modification 2 will have limited impacts on bird and bat species flying up to 100m. As such, s5A assessment of significance for each species will not provide useful additional information about risks to these species.</p>
	<p>A Bird and Bat Risk Assessment detailing potential impacts on all at risk birds and bats should be carried out which includes</p>

Table 4. Response to NSW Office of Environment and Heritage

Issue	Recommendation/Response
	<p>the impact on raptors.</p> <p><i>Response:</i></p> <p>A Bird and Bat Risk Assessment has been prepared by Brett Lane and Associates, including consideration of impacts on raptors (refer to Appendix 8 for the full report and to section 9.8 of this report for a summary).</p>
	<p>Clarify that the lower minimum RSA height is 30m, not 28m.</p> <p><i>Response:</i></p> <p>The original approved turbine dimensions were a lower minimum RSA height of 27m above ground, and the proposed Modification 2 dimension have a minimum RSA height of 30m above ground.</p>
	<p>The Bird and Bat Adaptive Management Plan (BBAMP) should be prepared in consultation with OEH, implemented prior to construction and include at least 12 months of pre-development surveys.</p> <p><i>Response:</i></p> <p>The BBAMP required under the current consent conditions has been developed in consultation with OEH. It is proposed that two bird utilisation surveys will be completed for the project: one of these was completed in autumn 2017, and another is proposed for spring 2017 which will form the pre-operation baseline.</p>
	<p>Provide justification as to why micro-siting needs to occur rather than detailed assessments as part of the MOD application. The Micro-siting Biodiversity Management Plan should include information on how buffer distances will be calculated in accordance with the Natural England Technical Information Note TIN051.</p> <p><i>Response:</i></p> <p>Micro-siting of turbines and wind farm infrastructure is standard practice to allow sufficient flexibility to respond to site conditions during construction. The Department's standard conditions for wind farms accommodate micro-siting up to 100 m. The proposed 50m micro-siting as part of Modification 2 provides the opportunity to address construction-related issues, and the Turbine Micro-siting Management Plan that has been prepared provides guidance to ensure any micro-siting will not have increased environmental impact.</p>
	<p>Provide justification for the removal of paddock trees and a map showing where they are located. OEH considers that given the lack of trees on the site it should be possible to site the turbines away from any paddock trees.</p>

Table 4. Response to NSW Office of Environment and Heritage	
Issue	Recommendation/Response
	<p><i>Response:</i></p> <p>The proposed removal of paddock trees is already approved (refer to original 2004 EIS Chapter 4, Figure 4-11), and no changes are sought to this aspect of the project as part of Modification 2, which will involve no additional paddock tree removal.</p>
	<p>Consultation with OEH on the preparation of the Construction and Operation and Flora Management Plans.</p> <p><i>Response:</i></p> <p>The approved Construction Environmental Management Plan (CEMP) Stage-1 sub-plan 6 includes a Flora and Fauna Management Plan (F&FMP) that is currently used for the construction phase. If the Modification 2 is approved, any revision to the future F&FMP will be done in consultation with OEH.</p>

6.5 NSW Roads and Maritime Services

The Roads and Maritime Services (RMS) has no objection to the proposed modification of Crookwell 2 Wind Farm. No particular issues were raised, but the following recommendations summarised in the following table were provided.

Table 5. Response to Roads and Maritime Services	
Issue	Recommendation/Response
Prior to construction certification	<p><i>Recommendation:</i></p> <p>Prior to the issuing of the construction certificate, the developer shall enter into a Works Authorisation Deed (WAD) with RMS for all works on Crookwell Road.</p> <p><i>Response:</i></p> <p>In June 2009, a Works Authorisation Deed (WAD) was signed and executed between CDPL and Roads and Maritime Services (RMS) [previously called Roads and Traffic Authority] for the works relating to the two access road entrances on Crookwell Road and the intersection of Crookwell Road and Woodhouselee Road south of the Site. The detailed design process was undertaken in liaison with RMS.</p> <p>The RMS Road Occupancy Licence (ROL) was issued on 20th June 2012, and construction certificate was granted for the road upgrade works on 31st July 2012 followed by the commencement of construction of the public road upgrade activities on 24th September 2012. The relevant road upgrade construction activities were completed on 5th March 2013.</p> <p>For any other upgrade to RMS roads, another WAD will be signed and executed with RMS before any upgrades are</p>

Table 5. Response to Roads and Maritime Services

Issue	Recommendation/Response
	<p>carried out on these roads.</p>
<p>Prior to traffic operating under the consent</p>	<p>Prior to transporting any oversized or over mass loads, the applicant shall obtain a permit for an oversized and over mass load from the RMS Special Permits Unit in Glen Innes.</p> <p><i>Response:</i></p> <p>The requirement to apply for a permit is acknowledged.</p>
	<p>The Traffic Management Plan (TMP) shall be developed in consultation with RMS Southern Traffic Operations Unit, Upper Lachlan and Goulburn Mulwaree Councils Local Traffic Committees (LTCs). The TMP and associated Traffic Control Plans shall be submitted to the Upper Lachlan Council LTC for final acceptance.</p> <p><i>Response:</i></p> <p>The approved Construction Environmental Management Plan (CEMP) Stage-1 sub-plan 4 includes a Traffic Management Plan (TMP) that is currently used for the construction phase. If the Modification 2 is approved, any revision to the TMP will be done in consultation with RMS, Upper Lachlan Shire Council and Goulburn Mulwaree Council.</p>
	<p>A copy of the accepted TMP shall be forwarded to RMS prior to any transportation occurring or works commencing on site for this development.</p> <p><i>Response:</i></p> <p>The Construction Environmental Management Plan (CEMP) Stage-2 (for over-dimensional transport vehicles) will be prepared in consultation with RMS, Upper Lachlan Shire Council and Goulburn Mulwaree Council.</p>
	<p>Concept plans for all roadworks on classified roads identified as part of the accepted TMP shall be submitted to RMS for acceptance of the treatment type.</p> <p><i>Response:</i></p> <p>The external road upgrade works on RMS roads in vicinity of the site have been completed as part of the WAD and ROL process in 2012-2013. Any other upgrades on classified roads identified as part of the CEMP Stage-2 will be submitted to RMS for acceptance of the treatment type.</p>
	<p>Should the TMP identify further construction works required on any State classified roads, RMS approval will be required and may require the developer to enter into a Works Authorisation Deed with RMS.</p> <p><i>Response:</i></p> <p>Noted.</p>

Table 5. Response to Roads and Maritime Services	
Issue	Recommendation/Response
	<p>All roadwork's, traffic control facilities and other works associated with this development, including any modifications required to meet RMS standards, will be at no cost to RMS. All works shall be completed prior to occupation.</p> <p><i>Response:</i> Noted.</p>
	<p>All roadwork's on classified roads shall be designed in accordance with <i>Austrroads Guide to Road Design – Part 4: Intersections and Crossing General</i> and RMS supplements.</p> <p><i>Response:</i> Noted.</p>
	<p>All roadworks and traffic control facilities on classified roads must be undertaken by a pre-qualified contractor.</p> <p><i>Response:</i> Noted.</p>
	<p>RMS will be exercising its powers under Section 64 of the <i>Roads Act 1993</i>, to become the roads authority for works on Crookwell Road. Given this, section 138 consent under the Act shall be obtained from the RMS prior to construction.</p> <p><i>Response:</i> Noted.</p>
	<p>The developer shall apply for, and obtain a Road Occupancy License from the RMS Traffic Operations Unit prior to commencing roadworks on a State Road or any other works that impact a travel land of a State Road or impact the operation of traffic signals on any road. The application will require a Traffic Management Plan to be prepared. The developer shall submit the ROL application 10 business days prior to commencing work.</p> <p><i>Response:</i> The requirement to apply for a Road Occupancy License is acknowledged and will be addressed by liaising with the relevant local office of the RMS.</p>

6.6 WaterNSW

WaterNSW has no objection to the proposed modification in principle, subject to the recommendations summarised in the table below.

Table 6. Response to WaterNSW	
Issue	Recommendation/Response

Table 6. Response to WaterNSW	
Issue	Recommendation/Response
Schedule 2, condition 5 and 26	<p>WaterNSW requests they are consulted with during the preparation of the Construction Environmental Management Plan and Operational Environmental Management Plan.</p> <p><i>Response:</i></p> <p>The project has been granted a Controlled Activity Approval from WaterNSW (previously called NSW Office of Water) for access tracks and cabling near the main watercourses within the project site. For any additional crossing locations, the Project will further consult with WaterNSW for licencing / approval provisions.</p> <p>The Project will further consult with WaterNSW for the preparation of the Operational Environmental Management Plan.</p>
Schedule 2, condition 84	<p>Soil and Water Management Plans be prepared in accordance with the following documents:</p> <ul style="list-style-type: none"> • Managing Urban Stormwater: Soils and Construction Vol 1 4th edition (Landcom, 2004 the 'Blue Book Vol.1'); and • Managing Urban Stormwater: Soils and Construction Vol. 2A of Services and Vol.2C Unsealed Roads (DECC, 2007 the 'Blue Book Vol. 2). <p><i>Response:</i></p> <p>These requirements reflect the current consent conditions.</p> <p>The approved Construction Environmental Management Plan (CEMP) Stage-1 sub-plan 7 includes a Soil and Water Management Plan (SWMP) that is currently used for the construction phase. If the Modification 2 is approved, any revision to the SWMP will be done in consultation with WaterNSW.</p>
Schedule 2, condition 107	<p>Replace 'the Sydney Catchment Authority' with WaterNSW.</p> <p><i>Response:</i></p> <p>Noted.</p>

6.7 Upper Lachlan Shire Council

The following table summarises the issues raised by the Upper Lachlan Shire Council in its submission.

Table 7. Response to Upper Lachlan Shire Council	
Issue	Response
Insufficient information concerning	The principal contractor (BMD Construction) is finalising their supply contracts for the earthworks material with various quarry operators in proximity to the site. The heavy haulage

Table 7. Response to Upper Lachlan Shire Council

Issue	Response
heavy vehicle transport routes	<p>vehicles will bring material to the site from the designated roads south of the project site. Woodhouselee Road section from the intersection of Crookwell Road to the access entrance will service the eastern part of the project site.</p> <p>In accordance with the conditions of Development Consent in 2005 and the subsequent negotiations with Upper Lachlan Shire Council (ULSC) in May of 2009, and the following approval of the Pre-Construction Compliance Report by Department of Planning in June 2009, the Woodhouselee Road can be used by the project as per the approved Construction Environmental Management Plan (CEMP) Stage-1 that encompasses all construction activities other than the delivery of the Over-Dimensional Vehicles that requires a CEMP Stage-2 approval by Department of Planning and Environment.</p> <p>The use of the Woodhouselee Road and any other Public Infrastructure is subject to Condition 11(a) of the Development Consent that states 'The Applicant must repair, or pay the full costs associated with repairing, any public infrastructure that is damaged by the development;' As such the Applicant must carry out regular inspections of the roads used by the development to ensure any damaged caused by the development is remediated as soon as possible.</p> <p>Crookwell Development Pty Ltd is currently in negotiations with ULSC for a repair/upgrade scope for the Woodhouselee Road from the intersection of the Crookwell Road to the wind farm site entrance. Although it is acknowledged that this part of Woodhouselee road currently accommodates other heavy haulage vehicles although in much smaller volumes than required for the construction of the Crookwell 2 Wind Farm.</p> <p>Additional information has been provided in the response to submissions letter prepared by GTA (refer to Appendix 10).</p>
Interference with telecommunications	<p>There may be some potential some impacts on television reception associated with the changes made to the project as part of Modification 2. Any such impacts can be effectively managed through the existing consent conditions and would be implemented with additional consultation with stakeholders, as discussed in section 7.6 of the EA. Also refer to Appendix 11 for further details and mitigation measures.</p> <p>Approved wind turbine F9, which was identified as having the potential to impact on the Crookwell repeater, has now been removed from the layout.</p> <p>The proponent is prepared to accept a pre-operation condition stating that the proponent will engage a specialist radiocommunications consultant to address the expected level of impact caused by possible interference from turbines at the Crookwell 2 Wind Farm to the quality of television reception provided by the recently commissioned Crookwell</p>

Table 7. Response to Upper Lachlan Shire Council	
Issue	Response
	repeater; and, if the expected level of impact is considered significant, the proponent will prepared a remediation plan encompassing alternative solutions to resolve any issues, including the potential installation of a new television repeater, in consultation with Upper Lachlan Shire Council; and, if the impact experience on the wind farm is fully operation is deemed significant, the proponent will implement the remediation plan as soon as practicable.

6.8 Goulburn Mulwaree Council

The following table summarises the issues raised by the Goulburn Mulwaree Shire Council in its submission.

Table 8. Response to Goulburn Mulwaree Council	
Issue	Response
Insufficient information concerning heavy vehicle transport routes and impacts of construction traffic on the local road network	<p>The Construction Environmental Management Plan (CEMP) for the Stage-1 was approved on 12th May 2009, this CEMP encompasses all construction activities other than the delivery of the Over-Dimensional Vehicles that requires a CEMP Stage-2 approval by Department of Planning and Environment. Based on this approval the development traffic will go through the state roads in Goulburn (i.e. Sydney Road, Lagoon Street, Goldsmith Street, Fitzroy Street, Crookwell Road).</p> <p>As part of the Crookwell 3 Wind Farm public exhibition process in 2013, the Council nominated the alternative route (i.e. Hume Street, Cowper Street, Clinton Street, Deccan Street, Fitzroy Street, Crookwell Road) for the development transport in particularly for the over-dimension vehicles. The Applicant's response for the Crookwell 3 Wind Farm was to use this alternate passage for both developments as the intersections along the alternate route was already augmented to accommodate other wind farm projects.</p> <p>In response to Council's comment that many of the roads identified in the application is not acceptable for the construction traffic generated, the Applicant will revert back to the original approved transport corridor on the state roads through Goulburn for the heavy haulage traffic, and will continue with the option for the Council's preferred alternate route for the over-dimensional vehicles.</p> <p>The principal contractor (BMD Construction) is finalising their supply contracts for the earthworks material with various quarry operators in proximity to the site. We understand that one of the main quarry locations designated to service the construction phase is located on Crookwell Road, south of Woodhouselee Road, as such the heavy haulage vehicles for the development from this location will not be travelling</p>

Table 8. Response to Goulburn Mulwaree Council	
Issue	Response
	<p>through Goulburn therefore significantly reducing the potential for impact to road pavement in Goulburn. Currently other quarry site options are located south of Marulan and south-east of Goulburn.</p> <p>Given that several key routes in the local area (excluding Woodhouselee Road that is specifically discussed above) have been used for access to other wind farm construction sites, it is not anticipated that any significant works, other than those outlined for over-dimensional vehicles access, would be required for the development.</p> <p>Additional information has been provided in the response to submissions letter prepared by GTA (refer to Appendix 10).</p>

6.9 Civil Aviation Safety Authority

The following table summarises the issues raised by the Civil Aviation Safety Authority (CASA) in its submission.

Table 9. Response to Civil Aviation Safety Authority	
Issue	Recommendation/Response
Obstacle Night Lighting	<p>Based on the revised maximum height of 160m AGL, CASA recommends that the wind farm is lit with steady red low intensity lighting at night as per Section 9.4 of the CASA Manual of Standards Part 139. Characteristics for low intensity lights are stated in subsection 9.4.6.</p> <p><i>Response:</i></p> <p>The existing approval has provisions for obstacle night lighting with flashing red medium intensity lighting as previous CASA recommendation in 2009. The project will not adopt the new standard and implement the steady red low intensity lighting as per the relevant standards mentioned above.</p>
Lighting design	<p>CASA agrees that the turbines that should be lit are those identified by the proponent in the drawing '100405 Crookwell 2 Wind Farm Obstacle Lighting Design v0.1 150810.</p> <p><i>Response:</i></p> <p>Due to the removal of turbine F9 from the layout, the lighting design is revised and new designs for the 28 turbine and 32 turbine stages are shown in Appendix 12.</p>
NASF Guideline D	<p>CASA recommends that the proponent makes the notifications described in the NASF Guideline D.</p> <p><i>Response:</i></p> <p>Noted. The proponent has previously notified the</p>

Table 9. Response to Civil Aviation Safety Authority	
Issue	Recommendation/Response
	Aeronautical Information Service of the Royal Australian Air Force (RAAF AIS) for all the existing wind monitoring towers / masts on the Crookwell 2 and 3 Wind Farm sites. The proponent will also notify the RAAF AIS for the location of the turbine towers when the final locations are determined.
Unmarked wind monitoring towers	<p>CASA notes there are two unmarked wind monitoring towers (WMTs) on the site and that three additional WMTs are proposed. CASA recommends that all five WMTs should be marked consistent with Guideline D of the National Airport Safeguarding Framework (NASF).</p> <p><i>Response:</i></p> <p>Noted. The proponent has previously notified the RAAF AIS for all the existing wind monitoring towers / masts on the Crookwell 2 and 3 Wind Farm sites. The proponent has also embarked on a program to install orange spherical ball markers on the guy anchors of the wind monitoring towers/masts.</p>

7 Response to Groups and Organisations

A total of 5 group and organisation submissions were received during the public exhibition period, 4 of which were in support of the proposed project.

7.1 Supporting submissions

Key points from the 4 supporting submissions are summarised as follows:

- The project is important for reducing carbon emissions.
- Water resources in the area will be protected.
- The project will provide economic benefit for the region.
- The neighbour agreements are a progressive step and should be used for other wind farm projects.

7.2 Parksbourne/Mummel Landscape Guardians Inc

The Parksbourne/Mummel Landscape Guardians Inc (PMLG) objected to the proposed modification to Crookwell 2 Wind Farm. The table below responds to the key issues raised by PMLG in its submission.

Table 10. Response to PMLG Issues	
Issue	Response
Visual impact	<p>The proposed wind turbines are consistent with the approved Modification 1 wind turbines with regard to their visual form, design, pattern and colour. This consistency, along with the proposed deletion of 14 approved wind turbines, reduces the overall extent of the magnitude of visual effects.</p> <p>While the proposed increase in wind turbine dimension would be discernible from some surrounding view locations, the Modification 2 turbines are not considered to be of a magnitude that would significantly increase visual effects associated with the approved Modification 1 development.</p> <p>It is considered that the existing conditions of consent are sufficient for ensuring that any visual impacts are appropriately managed.</p>
Noise impact	<p>The proponent acknowledges there is noise associated with the operation of turbines and proposes to mitigate the impact on receivers by using a mitigated layout, whereby a number of turbines are configured to implement the noise optimization mechanism offered by the turbine manufacturer that utilises a combination of sector management, wind speed condition, and reduced noise mode operations to achieve compliance.</p> <p>It is considered that the conditions of consent proposed by the NSW Environmental Protection Authority (EPA) that set a 35dBA or background + 5dBA (whichever is greater) noise limit criteria is appropriate to mitigate the impacts of turbine operational noise on sensitive receiver locations.</p>

Table 10. Response to PMLG Issues

Issue	Response
Distance between turbines	<p>The primary purpose for the turbine spacing consideration is to reduce wake turbulence on adjacent turbines and hence maximise efficiency and energy yield of the project. The manufacturers also ensure that the turbine spacing is sufficient to be able to provide the appropriate design life calculations and subsequent warranties, this has been confirmed acceptable by the manufacturers. The limits for the noise emissions from the wind turbines in NSW are guided by the 35dBA or background + 5dBA (whichever is greater), this noise limit criteria has been proposed by the NSW Environmental Protection Authority.</p>

8 Response to Public Submissions

8.1 Summary of Public Submissions

A total of 48 submissions from the public were received during the public exhibition period, 31 of which (over 64%) were in support of the project. Many issues were similar in nature and have been grouped in accordance with the issue as illustrated in the table below.

Table 11. Summary of Public Submissions

Submission no.	Aerial agriculture	Biodiversity	Consultation	Decommissioning	Economic and social	Fire Fighting	Health impacts	Operation Noise	Renewable energy	Telecommunication	Visual	General
172182							☐					
172044					☐							
172166								☐				
171223											☐	
172148											☐	
171819					☐				☐			
172174					☐							
171805					☐						☐	
172190					☐				☐			
172016					☐				☐			
171777											☐	
172114							☐					
173065					☐				☐			
171827								☐				
172132								☐		☐	☐	
173074		☐			☐						☐	

Table 11. Summary of Public Submissions

Submission no.	Aerial agriculture	Biodiversity	Consultation	Decommissioning	Economic and social	Fire Fighting	Health impacts	Operation Noise	Renewable energy	Telecommunication	Visual	General
169919		☐	☐	☐			☐			☐	☐	
171831												☐
171809									☐			
171924					☐				☐			
172154								☐	☐			
173088	☐				☐	☐					☐	
172156, 172158					☐				☐			
171757					☐				☐			
171537, 171541, 171545, 171551								☐			☐	
172130					☐				☐			
172100					☐				☐			
171747								☐			☐	
171885					☐				☐			
171823					☐							
173082					☐				☐			
171930					☐							
172160					☐				☐			
No ID	☐					☐		☐		☐	☐	
196362					☐		☐	☐			☐	

Table 11. Summary of Public Submissions

Submission no.	Aerial agriculture	Biodiversity	Consultation	Decommissioning	Economic and social	Fire Fighting	Health impacts	Operation Noise	Renewable energy	Telecommunication	Visual	General
178566							☐	☐		☐	☐	
171414									☐			
171427					☐							
172176									☐			
171431									☐			
172178					☐				☐			
171424												☐
171433					☐				☐			
171232					☐							
171835												☐
171234					☐				☐			
171797									☐			
172106					☐				☐			

8.2 Supporting Public Submissions

The 31 supporting public submissions largely emphasised the positive economic and renewable energy impacts of the Crookwell 2 Wind Farm project. Key points from the submissions are summarised as follows:

- Wind is preferable to coal as an energy source from a climate change and environmental impact perspective.
- The proposed modifications take advantage of the latest technology, which will reduce the environmental footprint of the project.
- The proponent has undertaken adequate community consultation.
- The wind farm will provide economic benefit to community in the form energy infrastructure investment, income to host properties, contribution to the Upper Lachlan Shire’s Community Enhancement Fund, contribution to the Neighbour Benefit Sharing Scheme, and jobs associated with construction and ongoing use.

8.3 Visual Impact Issues

Visual impact issues resulting from Modification 2 were addressed in sections 7.1 and 7.2 of the EA and supported by specialist reports, Appendix 6 –Visual Impact Assessment and Appendix 7 – Shadow Flicker and Blade Glint Assessment. The assessment concluded, ‘the visual effects associated with the proposed modifications is summarised as low to negligible’.

The table below provides a response to the key visual impact issues raised by submissions 171223, 172148, 171805, 171777, 172132, 173076, 169919, 173074, 173088, 171541, 171551, 171747, 196362, 178566 and one confidential email submission with no ID.

In addition, Green Bean Design has prepared a separate response to submission letter to provide a detailed response to the submissions related to visual impacts (see Appendix 1).

Table 12. Response to Visual Impact Issues	
Issue	Response
Visual impact	<p>The proposed wind turbines are consistent with the approved wind turbines with regard to their visual form, design, pattern and colour. This consistency, along with the proposed deletion of 14 approved wind turbines, reduces the overall extent of the magnitude of visual effects resulting from the proposed Modification 2.</p> <p>While the proposed increase in the maximum wind turbine dimension would be discernible from some surrounding view locations, the Modification 2 turbines are not considered to be of a magnitude that would significantly increase visual effects associated with the approved Modification 1 development.</p> <p>It is considered that the current consent conditions are sufficient for ensuring that any visual impacts resulting from Modification 2 are appropriately managed.</p>

Table 12. Response to Visual Impact Issues	
Issue	Response
Shadow flicker	<p>No non-associated residential dwellings will experience shadow flicker which exceeds an accumulated 30 hours per year in accordance with relevant guidelines as per the Shadow Flicker Assessment undertaken by DNV GL.</p> <p>It is considered that the current consent conditions are sufficient for limiting the impacts resulting from Modification 2 on shadow flicker.</p>

8.4 Operational Noise Issues

Operational noise issues resulting from Modification 2 were addressed in section 7.3 of the EA and supported by a specialist report, Appendix 8 – Noise Assessment. This confirmed that compliance at all receptors can be achieved using a mitigated layout where some wind turbines are operated in sound management mode.

The table below provides a response to the key noise issues raised by submissions 172166, 171827, 172132, 171545, 171747, 193662, 178566 and one confidential email submission with no ID.

Table 13. Response to Operational Noise Issues	
Issue	Response
Impact on receivers	<p>The proponent acknowledges there is noise associated with the operation of turbines and proposes to mitigate the impact on receivers by using a mitigated layout, whereby a number of turbines are configured to implement the noise optimization mechanism offered by the turbine manufacturer that utilises a combination of sector management, wind speed condition, and reduced noise mode operations to achieve compliance.</p> <p>It is considered that the conditions of consent proposed by the NSW Environmental Protection Authority (EPA), which set a 35dBA or background + 5dBA (whichever is greater) noise limit criteria is appropriate to mitigate the impacts of turbine operational noise on sensitive receiver locations, are sufficient to mitigate noise impacts.</p>
Increase in turbine height impact on noise	<p>There are a number of factors which play a part on noise impacts, such as distance from the turbine, topography, vegetation, wind conditions and height.</p> <p>The proposed Modification 2 will involve the substitution of the existing approved turbine size and models with an alternative turbine model that is larger and more efficient. Although the newer turbine model will have a different noise profile, it also has much more sophisticated noise mitigation measures available to it.</p> <p>The size, capacity and noise output characteristics of the proposed turbines were taken into consideration in the noise</p>

Table 13. Response to Operational Noise Issues

Issue	Response
	assessment. The assessment demonstrates that the proposed modification to the development would be capable of achieving the noise limits set under the updated noise limit condition recommended by the NSW Environmental Protection Authority.

8.5 Telecommunication Issues

Telecommunications impacts resulting from Modification 2 were addressed in section 7.6 of the EA and supported by a specialist report: Appendix 11 – Electromagnetic Interference Report. The assessment concluded that effective mitigation measures can be employed in the case of any interference.

The table below also provides a response to the key telecommunications issues raised by submissions 172132, 169919, 178566 and one confidential email submission with no ID.

In addition, DNV GL has prepared a response to submissions letter (see Appendix 11) to address issues raised by objectors, namely impacts on television reception associated with the recently installed television signal repeater for commercial network broadcasts at Wades Hill in Crookwell.

Table 14. Response to Telecommunications Issues

Issue	Response
TV reception	<p>There may be some potential some impacts on television reception associated with the changes made to the project as part of Modification 2. Any such impacts can be effectively managed through the existing consent conditions and would be implemented with additional consultation with stakeholders, as discussed in section 7.6 of the EA.</p> <p>Approved wind turbine F9, which was identified as having the potential to impact on the Crookwell repeater, has now been removed from the layout.</p> <p>The proponent is prepared to accept a pre-operation condition stating that the proponent will engage an experienced radiocommunications consultant to address the expected level of impact caused by possible interference from turbines at the Crookwell 2 Wind Farm to the quality of television reception provided by the recently commissioned Crookwell repeater; and, if the expected level of impact is considered significant, the proponent will prepared a remediation plan encompassing alternative solutions to resolve any issues, including the potential installation of a new television repeater, in consultation with Upper Lachlan Shire Council; and, if the impact experience on the wind farm is fully operation is deemed significant, the proponent will implement the remediation plan as soon as practicable.</p>

Table 14. Response to Telecommunications Issues

Issue	Response
Radio reception	<p>It is unlikely that Modification 2 will have an impact on AM radio as the signals are able to propagate around obstructions and buildings.</p> <p>The proponent agrees that there may be some potential impact to the interference of FM signals as a result of Modification 2. It is considered that the current consent conditions are sufficient for ensuring that any electromagnetic interference impacts are properly mitigated (refer to section 7.6 of the EA).</p>
Mobile reception	<p>A review of the mobile coverage for the area has found that there is generally fair to good network coverage in most areas around the project, and mobile signals are unlikely to be affected by proposed Modification 2.</p> <p>However, there are some areas where coverage may be marginal, and therefore mobile signals may be susceptible to interference. If interference is encountered, it is considered that the current consent conditions are sufficient for ensuring that any electromagnetic interference impacts are properly mitigated.</p>

8.6 Aviation Issues

Aviation impacts resulting from Modification 2 were addressed in section 7.5 of the EA and supported by a specialist report: Appendix 10 – Aviation Impact Assessment.

The table below provides a response to the key aviation issues raised by submission 173088 and a confidential email submission with no ID.

Table 15. Response to Aviation Issues

Issue	Response
Impact on aerial agricultural practices	<p>Based upon the input of key stakeholders during the preparation of the Aviation Impact Assessment, it was concluded that the proposed modifications will result in a reduced net impact on aerial agricultural operations.</p> <p>It is considered that the current consent conditions are sufficient for ensuring that any impacts on aerial agricultural practices are mitigated.</p>
Impact on fire fighting	<p>The Aviation Impact Assessment concluded that there is no significant impact on NSW Rural Fire Service (RFS) aerial firefighting operations as a result of the modification.</p> <p>It is considered that the current consent conditions are sufficient for ensuring that any impacts to bush fire fighting are avoided.</p>

8.7 Flora and Fauna Issues

Flora and fauna impacts were addressed in section 7.8 of the EA and supported by specialist reports: Appendix 13 and 14.

The table below provides a response to the key flora and fauna issues raised in submissions 169919 and 173074.

Table 16. Response to Flora and Fauna Issues	
Issue	Response
Impact on bird movement	<p>The risk of bird collision at wind farms is considered low. Most birds are able to detect turbines and take action to avoid colliding with them. It is likely that collisions will mostly involve common farmland species. Any additional collisions due to the net increase in the rotor swept area (RSA) extent as a result of Modification 2 are unlikely to have a significant effect on the local or regional populations of these common species.</p> <p>A Bird and Bat Adaptive Management Plan has been prepared by Brett Lane and Associates (refer to Appendix 9). This plan provides a program for monitoring the impacts on birds and bats and an overall strategy for managing and mitigating any significant impacts arising from the operation of the wind farm. The existing controls in this plan are considered appropriate to manage potential impacts.</p>

8.8 Health Issues

The table below provides a response to the key health issues raised in submissions 172114, 169919, 196362 and 178566.

Table 17. Response to Health Issues	
Issue	Response
Human health impacts	<p>In February 2015, the National Health and Medical Research Council (NHMRC) released the following statement regarding evidence on wind farms and human health:</p> <p style="padding-left: 40px;">‘After careful consideration and deliberation of the body of evidence, NHMRC concludes that there is currently no consistent evidence that wind farms cause adverse health effects in humans’.</p> <p>Furthermore, a position statement on Wind Farms and Health (2014) by the Australian Medical Association also states:</p> <p style="padding-left: 40px;">‘The infrasound and low frequency sound generated by modern wind farms in Australia is well below the level where known health effects occur, and there is no accepted physiological mechanism where the sub-audible infrasound could cause health effects’.</p> <p>The Planning Assessment Commission, in its recent Determination Report for the Rye Park Wind Farm (SSD 6693), was satisfied with the Department of Planning and</p>

Table 17. Response to Health Issues	
Issue	Response
	Environment’s recommendation that the project would not pose an unacceptable risk to the health of local residents.
Livestock health impacts	The proponent is not aware of any scientific evidence to suggest any the impacts from operational wind farms on livestock.

8.9 Economic and Social Issues

The proposed modifications are not anticipated to have an adverse social or economic impact. The detailed analysis submitted with the original Crookwell 2 Wind Farm application is considered relevant and authoritative. This analysis concluded that the project would provide a positive contribution to the economy and local community.

The table below provides a response to the key economic and social issues raised by submissions 171805, 173076, 173074, 173088 and 196362.

Table 18. Response to Economic and Social Issues	
Issue	Response
Socio-economic impact	<p>The proposed modifications are not anticipated to have any adverse social or economic impacts.</p> <p>The project will have a positive net present value, as such, would provide a positive contribution to the economy and local community.</p> <p>Additionally, the project will contribute in the following ways:</p> <ul style="list-style-type: none"> • Provide capital investment, direct and flow-on economic benefits through permanent and temporary employment; • Help maintain the existing agricultural activities; and • Support national and international efforts to reduce the potential impacts of global warming and climate change. <p>All of these benefits would be maintained or improved upon through the proposed modifications, which features better, more efficient technology and fewer turbines.</p>
Impact to property value	<p>The proposed Modification 2 is permissible with consent, and the environmental impacts associated with the modification are acceptable. Property value impacts are not considered a sufficient reason to refuse consent to a development that is otherwise acceptable on all other planning grounds.</p> <p>This accords with the judgement in <i>King & Anor V Minister for Planning; Parkesbourne-Mummel Landscape Guardians Inc v Minister for Planning; Gullen Range Wind Farm Pty Limited v Minister for Planning</i> ([2010] NSWLEC 1102), which, it is noted, was cited in the recent Planning Assessment Commission</p>

Table 18. Response to Economic and Social Issues	
Issue	Response
	Determination Report for the Rye Park Wind Farm (SSD 6693).

8.10 Decommissioning Issues

The table below provides a response to the key decommissioning issue raised by submission 169919.

Table 19. Response to Decommissioning Issues	
Issue	Response
Responsibility for decommissioning	<p>The proponent is committed to preparing a Decommissioning and Rehabilitation Plan (DRP) prior to commencement of the full operation of the Crookwell 2 Wind Farm project.</p> <p>The DRP will detail the process for decommissioning and rehabilitation of the project site and the estimated cost associated with it. The DRP will also estimate the scrap value of the material (i.e. steel) that would help fund the decommissioning phase.</p> <p>The DRP will be reviewed once every 5 years during the operation phase of the project to guide the proponent on the potential additional budget that may be required. In the last 5 years of the design life of the project (i.e. year 20) the proponent will establish an internal fund to ensure there are sufficient amount of budget available to pay for the decommissioning phase.</p> <p>The decommissioning and rehabilitation activities will be undertaken with consultation with relevant stakeholders at the time of decommissioning.</p> <p>The current consent conditions place the responsibility for decommissioning on the proponent of the project.</p>

8.11 Community Consultation Issues

The table below provides a response to the key community consultation issue raised by submission 169919.

Table 20. Response to Community Consultation Issues	
Issue	Response
Inadequate community consultation	<p>It is considered that adequate consultation has been carried out for the Modification</p> <p>Extensive community consultation occurred for the proposed Modification 2 project, including:</p> <ul style="list-style-type: none"> • local newspaper advertisements in 2015 and 2016;

Table 20. Response to Community Consultation Issues

Issue	Response
	<ul style="list-style-type: none"> • door knocks and/or similar meets with landowners and residents within 3km of the project site in December 2015; • direct mail-out to households within 3km of the project site in August 2016; • project newsletters were made available at the Upper Lachlan Shire Council offices in Crookwell; and • further consultation with participants in the voluntary Neighbour Benefit Sharing Agreement from late 2015 until May 2017.

9 Summary of Specialist Reports

9.1 Visual Impacts

Green Bean Design has prepared a comprehensive response to submissions letter to address the issues raised by individual objectors (refer to Appendix 1).

It was found that a large portion of the objectors' concerns related to misinterpretation of the information contained within the Crookwell 2 Wind Farm Modification 2 Visual Impact Assessment Report (May 2016). Accordingly, the bulk of the letter is devoted to clarifying the contents of the May 2016 report.

In particular emphasis on the result of the visual impact assessment that concluded that the proposed increase in wind turbine dimension in Modification 2 are not considered to be of a magnitude that would significantly increase visual effects associated with the approved development.

The letter also considers the updates to the site and infrastructure layout, including the newly identified dwellings in the area. Overall it was found that the proposed Modification 2 would have low to moderate impacts on the newly identified dwellings. No further mitigation measures were identified.

9.2 Acoustic Impacts

SLR has reviewed the acoustic-related comments provided by the Environmental Protection Authority and has provided a response letter (refer to Appendix 2). This is addressed at Table 13 above. The letter also contains information regarding the removal of turbine F9 and the updates to the quantity and location of sensitive receptors.

Key points from the letter include:

- None of the inconsistencies identified by the Environmental Protection Authority regarding the location of sensitive receptors are critical to compliance, nor are they reference positions for license limits.
- The viability of sector management mode along with wind speed condition and noise management mode as a noise mitigation measure has been confirmed through a noise optimisation analysis conducted by the manufacturer and will be guaranteed by a noise guarantee from the manufacturer.
- The updated noise conditions proposed have been reviewed and in general are acceptable.
- Additional noise modelling considering the removal of turbine F9 has been conducted. The modelling indicates that a mitigated layout using a combination of noise management modes achieves compliance at all non-project receptors.

9.3 Response to Submissions (Heritage)

A response to submissions letter has been prepared by Bowen Heritage Management (refer to Appendix 3) to provide a direct response to the heritage-related comments from the Office of Environment and Heritage (OEH) This is addressed in Table 4 above.

In summary, the letter provides comprehensive responses to OEH's comments and requests, and identifies that no further archaeological assessment is required for the remaining turbine locations as long as micro-siting is limited to within 50 metres

of the approved turbine locations, and no need for additional information or any amendments to the project consent conditions. The letter identifies that new sections of access tracks (realignment) will require further assessment. The letter also identified that the proposed removal of turbines and associated access track and subsequent realignments enabled the project to avoid impact on several previously identified heritage sites.

Additional field surveys for the access track and cabling realignments were carried out in March 2017, with results and recommendation shown in section 9.4.

9.4 Aboriginal Cultural Heritage Assessment Report

An Aboriginal Cultural Heritage Assessment (ACHAR) has been prepared by Bowen Heritage Management to assess the implications for Aboriginal cultural heritage associated with the proposed Modification 2 (refer to Appendix 4).

The overall objectives of the assessment were to:

- Conduct Aboriginal consultation as specified in clause 80c of the National Parkes and Wildlife Regulation, using the consultation process outlined in the 'Aboriginal cultural heritage consultation requirements for proponents 2010';
- Assess the cultural significance of any archaeological material; and
- Provide management recommendations for any objects found.

The details of the field survey work conducted in March 2017 to inform the ACHAR are contained in the separate Aboriginal Heritage Archaeology Report (refer to Appendix F of the ACHAR).

In light of the consultation conducted and the findings of the archaeology report, Bowen Heritage Management recommends the following:

- No impacts may occur to any of the recorded heritage sites until an AHIP has been approved by the NSW OEH.
- Impacts to the identified heritage sites should be avoided if possible. Where possible in the road and cable alignments design should be undertaken to avoid impacts to identified heritage sites.
- The recommendations of the Archaeological Report (Appendix F of the ACHAR) should be followed and implemented in full.
- Should any Aboriginal objects be encountered during works then works must cease in the proximity of the area and the find should not be moved until assessed by a qualified archaeologist in line with the consent conditions.
- In the unlikely event that human remains are discovered during the construction, all work must cease. OEH, the local police and the appropriate LALC should be notified. Further assessment would be undertaken to determine if the remains are Aboriginal or non-Aboriginal.

Continued consultation with the Registered Aboriginal Parties (RAPs) for the project should be undertaken. The RAPs should be informed of any major changes in project design or scope and any further investigations or finds.

An Aboriginal Heritage Archaeological Report has been prepared by Bowen Heritage Management to detail the archaeological investigations undertaken as part of the proposed Modification 2. This report supplements the main ACHAR and can be found at Appendix F of the ACHAR.

The overall aim of the archaeological report is to inform the proponent of their responsibilities regarding Aboriginal cultural heritage sites that exist within the project area.

A field survey was undertaken in March 2017, and the results show that 20 of the 55 previously recorded sites will be impacted by the proposed Modification 2. Three sites were identified along the access road which runs west from Woodhouselee Road, one of which will be impacted by the project. Nine new heritage sites were recorded as a result of the field survey, none of which will be impacted. As such, a total of 21 heritage sites will be impacted, which is a significant reduction from the original approved layout.

To mitigate impacts, a range of detailed management recommendations have been developed. Refer to the archaeological report for details.

9.5 Response to Submissions Letter (Ecology)

A response to submissions letter has been prepared by Brett Lane and Associates (refer to Appendix 5) to provide a direct response to the ecology-related comments and requests for information from the Office of Environment and Heritage (OEH). This is addressed in Table 4 above.

In summary, the letter provides comprehensive responses to OEH's comments and requests, and identifies no need for additional information or any amendments to the project or consent conditions.

9.6 Vegetation Impact Assessment

A Vegetation Impact Assessment has been prepared by Brett Lane and Associates (refer to Appendix 6) in response to a request from OEH to assess the potential impacts associated with the proposed access track and cabling re-alignment under Modification 2.

The assessment found that very little native vegetation occurred in the study area (as was the case with previous assessments). Only two very small vegetation units that could be identified as coherent native vegetation types were recorded:

- Snow gum – Candle Bark grassland/woodland of the South Eastern Highlands (Unit 10); and
- Broad-leaved Peppermint – Brittle Gum – Red Stringybark dry open forest of the South Eastern Highlands (Unit 16).

All other vegetation units comprised highly degraded treeless 'improved pasture' and *Gully Reedland/Sedgeland*, which were entirely or heavily dominated by introduced species.

A total of 12 scattered indigenous 'paddock' trees were recorded during the field assessment. A number of planted tree rows were also recorded in the study area.

None of the vegetation in the study area met the descriptions of any threatened communities. Vegetation Unit 10 comprised elements of the TSC Act-listed Tablelands Snow Gum Grassy Woodland community but is unlikely to classify as that community.

No flora species listed under the EPBC Act and TSC Act are considered likely to occur in the study area due to a lack of suitable habitat.

Scattered paddock trees in the Improved Pasture or Gully Reedland/Sedgeland vegetation units should be avoided where practical, as these indigenous trees do have value for biodiversity, particularly owing to their rarity in the study area.

Brett Lane and Associates recommend that Vegetation Unit 16 should be avoided where practical, and the final proposed wind farm layout accommodates this recommendation.

OEH has requested an assessment of significance for any Tablelands Snow gum Grassy Woodland community identified in the study area, impacts on which may subsequently require a Species Impact Statement (SIS). Provided it can be demonstrated that Vegetation Unit 10 will be avoided and protected, there will no need for such a SIS. Brett Lane and Associates recommend that that Vegetation Unit 10 be avoided by re-routing the access track around this vegetation and through improved pasture. The final proposed wind farm layout accommodates this recommendation.

Provided that mitigation measures outlined in the Supplementary Ecological Impact Assessment and the Turbine Micrositing Management Plan (Appendix 13 and 14, respectively, of the EA) are implemented, it is considered that Brett Lane and Associates' assessment is sufficient for satisfying OEH's concerns.

9.7 Bird and Bat Utilisation Surveys

Bird and Bat Utilisation Surveys have been prepared by Brett Lane and Associates to provide data on the utilisation by birds and bats of the Crookwell 2 and 3 Wind Farm sites during February-March 2017 (refer to Appendix 7).

These surveys resulted in a set of data being collected on birds and bats and will provide a baseline measure on bird and bat utilisation for comparison with future post-construction data.

Conclusions from the bird survey are as follows:

- The study area consists largely of cleared ridges and plateaus supporting an abundance of common, predominantly farmland birds.
- The study area supports very few raptors or waterbirds—groups considered vulnerable to collision with operating wind turbines. Raptors and waterbirds represented 0.5% and 0.2%, respectively, of all birds surveyed.
- The diversity of birds recorded within the study area was low.
- Bird abundance and diversity was higher at observation sites surrounded by remnant woodlands or scattered trees compared to sites lacking trees.
- The list of birds recorded flying at Rotor Swept Area (RSA) heights was similar between the eight impact observation points. The five most abundant species accounted for almost 81% of the birds counted at RSA height. These were all common species that are widespread across the site and wider region. Raptors were not common, with only 0.5% of all records being recorded at RSA heights. Waterbirds were similar to raptors, with only few recorded flying at RSA height.
- The utilisation rate of the Wedge-tailed Eagle averaged 0.92 eagles per hectare per hour during the survey. The utilisation rate of other raptors and waterbirds was found to be also very low when compared to similar rates from other wind farms in the area.
- One species of threatened birds was recorded utilising the study area—Varied Sittella. The Sittella is a woodland bird that rarely ventures outside the woodland and was seen during the formal counts or incidentally within or close to woodland areas. The collision risk to threatened species from operating turbines is considered low.
- The pre-operational fixed point bird utilisation surveys have satisfied the requirements obtaining pre-operational baseline bird utilisation data.

Conclusions from the bat survey are as follows:

- Ten bat species and one species complex were identified during the survey.
- Species utilising the same site were common and widespread farm species in south-eastern Australia.
- Two species listed as vulnerable on the NSW TSC Act 1995—the Eastern Bentwing Bat (EBB) and Yellow-bellied Sheathtail Bat—were possibly part of the bat fauna at the site. The EBB was not actually positively identified on its own but was recorded as part of a species complex with Forest Bats. The second species was listed based on a single call only.
- Bats differed in flight height. The eastern Freetail and Long-eared bats were the two species recorded at RSA height (over 30m above ground), while the White-striped Freetail Bat commonly known as the species flying at this height, was recorded from one call only.
- No threatened bat species were recorded at RSA height.
- Most of the bat species were recorded at heights below RSA (below 30m) and are therefore considered to be exposed to a lower level of risk collision with operating wind turbines.

9.8 Bird and Bat Adaptive Management Plan Risk Assessment

An updated Bird and Bat Adaptive Management Plan Risk Assessment has been prepared by Brett Lane and Associates (refer to Appendix 8) as requested by the Office of Environment and Heritage to assess the impacts of the proposed Modification 2.

The assessment forms a basis for focusing the monitoring and investigations forming part of the Bird and Bat Adaptive Management Plan (outlined in the following section).

In summary, the risk associated with wind turbine collision and indirect effects the wind farm for most birds and bats was rated as **negligible**. The exceptions were:

- Wedge-tailed Eagle—**moderate** risk;
- Other raptors—**low** risk;
- White-throated Needletail—**low** risk;
- Eastern bent-wing Bat—**low** risk; and
- White-striped Freetail Bat—**low** risk.

The Bird and Bat Adaptive Management Plan (outlined in the following section) provides specific management measures for the low-to-moderate risk species.

9.9 Bird and Bat Adaptive Management Plan

A Bird and Bat Adaptive Management Plan (BBAMP) has been prepared by Brett Lane and Associates (refer to Appendix 9) in accordance with Condition 83 of the development consent.

The overall aim of the BBAMP is to provide a program for monitoring the impacts on birds and bats and an overall strategy for managing and mitigating any significant impacts arising from the operation of the windfarm. The BBAMP was informed by the Risk Assessment outlined in the section above.

The main management approaches identified in the BBAMP include:

- A robust carcass-monitoring program to serve as a basis for an estimate of overall bird and bat mortality rates.
- Mitigation measures to reduce possible interactions between birds and bats and operating turbines, including:
 - Carrion removal program and stock forage control; and
 - Measures to reduce the impact of lighting, such as UV filters, coloured lighting and baffled lighting.
- Specific management contingencies for key species and groups identified in the risk assessment and/or initiated due to specific impact trigger. Examples of specific measures include:
 - Consider the use of acoustics to discourage birds from foraging in the relevant location (where such noise would not impact neighbours);
 - Discourage nesting close to turbines; and
 - Temporary shutdown of turbines found to cause problems during periods of extremely low visibility.

9.10 Traffic Impacts

GTA Consultants has reviewed the traffic-related comments from Goulburn Mulwaree Council, Upper Lachlan Shire Council and RMS, and has prepared a response to submissions letter (refer to Appendix 10).

Upper Lachlan Shire raised specific concern about condition of Woodhouselee Road from Crookwell Road to the northernmost access to the site. To address this concern, representatives of the proponent undertook a general inspection of this stretch of road in February 2017. The inspection identified that the section of the road that is designated to be used by the project (8.4 km for Crookwell 2 Wind Farm) was generally in good condition and deemed to be of a standard capable for accommodating heavy haulage vehicles in accordance with the original consent and subsequent Modification 1 consent.

GTA recommends that the proponent perform regular inspection and monitoring of the Woodhouselee Road section from Crookwell Road intersection to the site access entrance, and undertake minor remediation works in response to damage caused by the development's use of the heavy haulage vehicles, noting that major reconstruction works of Woodhouselee Road (if required) will only be undertaken once by the proponent at the completion of construction of the Crookwell 2 and 3 Wind Farms.

Goulburn Mulwaree raised specific concern about the lack of information regarding heavy vehicle transport routes and the impacts of construction traffic on the road network. In response to this concern, the proponent will revert back to the original approved transport corridor on the State roads through Goulburn for the heavy haulage traffic, and will continue with the option for Council's preferred alternative route (identified during the Crookwell 3 Wind Farm 2013 public exhibition process) for the over-dimensional vehicles.

9.11 Electromagnetic Interference

A response to submissions letter has been prepared by DNV GL (refer to Appendix 11) to address concerns related to potential television interference—specifically, impacts on the recently installed television signal repeater for commercial network broadcasts at Wades Hill in Crookwell.

As outlined in that letter, the proponent has agreed to additional mitigation measures to reduce the potential impact upon the Crookwell repeater:

- Approved wind turbine F9, which was identified as having the potential to impact on the Crookwell repeater, has now been removed from the layout.
- The proponent is prepared to accept a pre-operation condition stating that the proponent will engage an experienced radiocommunications consultant to address the expected level of impact caused by possible interference from turbines at the Crookwell 2 Wind Farm to the quality of television reception provided by the recently commissioned Crookwell repeater; and, if the expected level of impact is considered significant, the proponent will prepared a remediation plan encompassing alternative solutions to resolve any issues, including the potential installation of a new television repeater, in consultation with Upper Lachlan Shire Council; and, if the impact experience on the wind farm is fully operation is deemed significant, the proponent will implement the remediation plan as soon as practicable.

9.12 Aviation

Due to the further reduction of turbine layout by removal of turbine F9, two revised obstacle night lighting layouts for the remaining 32 turbines has been prepared.

In consideration of the staged construction provisions in the development consent, initially a 28 turbine layout will be constructed for the Feed-in Tariff contract with ACT Government, and the remaining 4 turbines will be constructed as part of a separate future contract. Refer to Appendix 12 for the revised obstacle night lighting design for the 28 turbine and a 32 turbine layouts.

10 Conclusion

This Report has been prepared in response to the submissions received following the public exhibition of the EA for the proposed Modification 2 Application of the Crookwell 2 Wind Farm project.

The EA was publicly exhibited from 11 October to 14 November 2016. A total of 62 submissions were received, including 48 submissions from individuals (31 of which, over 64%, supported the proposed Modification 2), 5 submissions from groups/organisations, and 9 submissions from government agencies.

This Report provides a direct response to the issues raised in the submissions and is supported by a range of specialist reports as outlined above.

Proposed modification 2 to the Crookwell 2 Wind Farm will, if approved, further reduce the environmental impact of the project (including by reducing the number of approved wind turbines from 46 to a maximum of 32) and provide for the more efficient generation of clean renewable energy by enabling the project to use one of the newest and most efficient wind turbine technologies available in the market.

The project will bring an array of environmental and economic benefits at the local, regional, state and federal level including:

- The removal of 14 approved turbines and associated access tracks and crane hardstand platforms, along with optimisation of the substation configuration and realignment of access tracks and cabling would reduce the disturbance footprint by approximately 7 hectares. This would be offset to some extent by the larger turbine foundations and hardstand areas and 6 metres wide permanent access track envelope, with the overall disturbance footprint reducing from 32 to 27 hectares.
- Generating around 80 direct jobs during construction, and around 13 ongoing operational jobs (including the 6 personnel for the 24/7 Control Centre in Canberra and 7 for the wind farm and the substation).
- The investment of ~ \$200 million in the economy, which includes a large portion involved in the earthworks, electrical works, grid connection, transport and installation of wind turbines and associated equipment.
- The total rated capacity of the project will increase from the approved 92 MW to up to 110 MW, which would result in the generation of ~ 340,000 megawatt hours (MWh) per year of clean renewable energy, in comparison to the ~270,000 MWh per year for the existing 46 approved turbine. The proposed Modification 2 would generate enough electricity to power ~48,500 average size households per year, which is equivalent to ~33% of Canberra's population.
- The displacement of ~330,000 tonnes of greenhouse gases, which is the equivalent of taking ~76,000 cars off the road.
- Contributing \$2,500 per operating turbine per year (as adjusted to the CPI) to the Upper Lachlan Shire Council's Community Enhancement Fund, to be spent on local projects benefiting the local community.
- Contributing to the Neighbour Benefit Sharing Scheme in place with several of the immediate neighbouring properties who have entered into Neighbour Deeds with the project.

Modification 2 is compatible with the existing land uses of the area and complies with relevant planning and environmental controls applicable to the project site.

In August 2016, Crookwell Development Pty Ltd was successful in winning the ACT government wind energy auction and securing a 20 years Feed-in Tariff contract for 91MW. As a result, construction of the currently approved elements of the layout have already commenced. Approval of Modification 2 is required to enable the construction of the project to proceed and the project benefits to be realised.