COLLECTOR WIND FARM

PRELIMINARY DESIGN AND LANDSCAPE PLAN

Prepared for:

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DOUCMENT CONTROL

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Section 1 Introduction

1.1 Introduction

Green Bean Design Pty Ltd (GBD) has been commissioned by RATCH Australia Pty Ltd (RATCH), through its wholly owned subsidiary Collector Wind Farm Pty Ltd (the Proponent), to prepare a Design and Landscape Plan (DLP) for the approved Collector Wind Farm (CWF).

This DLP has been prepared in response to the Collector Wind Farm Consolidated Project Approval, Conditions of Approval (CoA) incorporating Modification 1 dated 22 July 2016 (Mod 1).

The CoA Condition B27 states that 'The Plan shall be prepared by a qualified landscape architect'. GBD confirm that this DLP has been prepared by Andrew Homewood who is a qualified registered landscape architect and GBD Principal Landscape Architect.

This DLP has been prepared with regard to the *Collector Wind Farm Landscape and Visual Impact Assessment* report prepared and submitted with the Environmental Assessment in January 2012 (EA LVIA) as well as the Collector Wind Farm Landscape and Visual Impact Assessment Addendum A dated 19 June 2013 (LVIA Addendum A).

GBD note that the CWF CoA does not authorise the construction of wind turbines 53, 54, 55, 56, 57, 58, 59 and 60. These wind turbines were included in the EA LVIA and the LVIA Addendum A. The removal of these wind turbines may result in some decrease in the degree of visual impact determined at some view locations, including residential dwellings identified in the EA LVIA and LVIA Addendum A reports. The removal of the 8 wind turbines results in a total of 55 approved wind turbines.

GBD also note that the approved CWF is subject to an application for a second modification (Mod 2). The Mod 2 Application report prepared by ngh environmental dated October 2018, determined that the proposed Mod 2 works associated with the upgrade of Lerida Road South and modification of the substation and grid connection, would have an overall decreased landscape and visual impact. The Mod 2 is currently subject to approval.

This DLP does not address the CoA Condition B20 which sets out requirements for off-site landscape works. Whilst both on-site and off-site landscape works are linked with regard to achieving visual mitigation through landscape planting works, the off-site landscape works will be addressed separately to the on-site landscape requirements.

1.2 DLP Staged Development

The DLP will be submitted to the NSW Government Department of Planning and Environment (DPE) Secretary in stages to suit the detailed design and construction program of the approved CWF project. The staged approach is in accordance with the CoA Condition B27. The DLP report will be issued to DPE at:

Preliminary Design Report (this report)

- Detailed Design Report and
- Construction Issue Report.

The DLP Detailed Design Report will be issued to DPE following completion of detailed design works for all ancillary infrastructure. The DLP Detailed Design Report will identify landscape areas to be included in the on-site landscape works and nominate plant species to be installed, planting densities and plant quantities. The DLP Detailed Design Report will also include a short form landscape specification. The DLP Detailed Design Report will also confirm the type of lighting fixtures to be installed and their locations.

The DLP Construction Issue Report will be issued to DPE following installation of the on-site landscape works. The DLP Construction Issue Report will document and confirm installation of the landscape works as documented in the DLP Detailed Design Report. The DLP Construction Issue Report will be illustrated with photographs of the installed landscape works.

The DLP Construction Issue Report will also be updated and re-issued to DPE at approximately 6 monthly intervals during the 24-month landscape maintenance period. The updated DLP Construction Issue Reports will include a record of all maintenance tasks undertaken and photographs of the installed landscape works to be taken from the same locations included in the original DLP Construction Issue Report for comparative purposes.

The final DLP Construction Issue Report, to be issued to DPE at the completion of the 24-month maintenance period, will include an audit of all on-site landscape works to confirm plant establishment.

1.3 CWF Project Approval

The original CWF Project Approval was granted on the 2 December 2013 under Part 3A of the NSW Environment Planning and Assessment Act 1979 (EP&A Act), and is subject to a number of CoA. The provision of this DLP is in accordance with Conditions B19 and B27 of the NSW Minister for Planning's CoA. The key requirements under the CoA and relevant clause are outlined in Table 1.

Table 1 – Conditions of Approval

Condition of Approval	Condition	Response
B19	Requires consultation with all residents and landowners who were determined to have a moderate to high visual impact in the LVIA Addendum A report prepared and submitted as part of the Collector Wind Farm Environmental Assessment.	Section 2 below details the extent of consultation with: - the residents identified in the LVIA Addendum A report; - the project's Community Consultative Committee (CCC); and - other residents living in proximity to the project.
		Engagement and consultation with the local community and the CCC will continue throughout the late development and

Table 1 – Conditions of Approval

Condition of Approval	Condition	Response
		construction stages of the project; to further inform the subsequent issues of the DLP.
B21	States that landscape treatments shall generally comprise indigenous and locally occurring tree and shrub species. A list of indigenous and locally and shrub species is included in T Planting Schedule.	
B22	Shall maximise the use of building materials and treatments for associated infrastructure which visually complement the surrounding environment.	A list of building materials and finishes is included in Table 2.
B23	Requires turbines to be painted matt off- white/grey. The blades shall be finished with a surface treatment that minimises any potential for glare or reflection. No advertising, signs or logos shall be mounted on the turbines, except where required for safety purposes.	A list of wind turbine finishes is included in Table 2.
B25	States that The Proponent shall ensure that the substations and associated facility sites are designed and constructed to minimise visual intrusion to the nearest sensitive receptors as far as reasonable and feasible, including appropriate external finishes to minimise glare or reflection, landscape planting to screen views, and external lighting requirements in accordance with condition B26.	A list of building materials and finishes is included in Table 2.
B26	States that with the exception of aviation hazard lighting implemented in accordance with the requirements of this condition, no external lighting other than low intensity security night lighting is permitted on site unless otherwise agreed or directed by the Secretary, or required by the Civil Aviation Safety Authority. Prior to the commencement of construction, the Proponent shall consult with the Civil Aviation Safety Authority on the need for aviation hazard lighting in relation to the wind turbines. If required, any aviation hazard lighting shall be implemented in a manner that minimises visual intrusion to surrounding non-associated receivers as far as reasonable and feasible.	Lighting installation, fixtures and locations will be addressed in the Detailed DLP Design Report.
B27	Requires preparation of a Design and Landscape Plan to outline landscape works on the wind farm site.	A staged Design and Landscape Plan has been prepared and will be updated and re-issued to DPE as detailed in this Preliminary DLP Report.

1.4 Conditions of Approval - Conditions B19 and B27

Conditions B19 and B27 are set out in full below.

Condition B19:

All residents, business owners or public authorities, whose dwelling, business or public area respectively, may be subject to medium, medium to high or high visual significance, as defined in the Collector Wind Farm LVIA Addendum A, shall be consulted regarding impact minimisation measures. The outcomes of this consultation process shall be used to inform the Design and Landscape Plan, required under condition B27.

Condition B27:

A Design and Landscaping Plan shall be prepared to outline measures to ensure appropriate development and maintenance of landscaping on the site to achieve adequate landscape buffers and address visual impacts arising from the project, including turbines, site access roads and associated above ground infrastructure, as far as is reasonable and feasible.

The Plan shall be prepared by a qualified landscape architect and be prepared on consultation with the Community Consultative Committee. The Plan shall include design treatments for the turbines and ancillary infrastructure, including, but not necessarily limited to:

- (a) the landscape screening measures at residences in close proximity to the Project site and along nearby roadsides to screen potential moderate to significant views of the Project, including an outline of additional measures available for landscaping treatments requested by owners of residential dwellings or businesses;
- (b) landscape elements and built elements, including proposed treatments, finishes;
- (c) lighting;
- (d) a schedule of species to be used in landscaping;
- (e) details of the timing and progressive implementation of landscape works; and
- (f) procedures and methods to monitor and maintain landscaped areas.

The plan shall be submitted for the approval of the Secretary prior to the commencement of construction, unless otherwise agreed by the Secretary. The Plan may be submitted in stages to suit the staged construction program of the project.

1.5 Design and Landscape Plan objectives

The key objectives of this DLP are:

- provide a DLP that fully addresses the requirements of Condition B27
- undertake consultation with residents and landowners with moderate to high visual impacts
- identify and outline reasonable and feasible on-site landscape treatments
- identify and outline additional measures available for requested landscape works off site within and up to 5 km from the wind turbines
- identify and outline onsite landscape treatments and proposed materials, finishes and treatments of exposed surfaces for built elements
- · identify and outline onsite lighting
- prepare a schedule of plant species to be used for onsite landscape works
- outline proposed timing and progressive implementation of landscape works and
- outline procedures and methods to monitor and maintain landscaped areas.

Section 2 Consultation

2.1 Introduction

In accordance with CoA Condition B19, the Proponent has engaged in an extensive consultation process with both the project Community Consultative Committee and the local community in proximity to the site.

This consultation process has comprised the following steps:

 Direct engagement through Sept-Oct 2018; with all residents (both associated and non-associated), business owners and / or public authorities, whose dwelling, business or public area respectively, may be subject to medium, medium to high or high visual significance, as defined in the Collector Wind Farm LVIA Addendum A (19 June 2013).

This comprised sharing information about the project and the opportunities / obligations of the condition through a combination of provision of information sheets (with specific project contact details to follow up), and direct discussions and telephone conversations between residents and the project Proponent.

The process focused on all 31 properties that were identified with medium, medium to high or high visual significance, as defined in the Collector Wind Farm LVIA Addendum A (19 June 2013), even though 20 of these were no longer identified as exceeding the medium significance threshold following the planning approval decision to remove 8 wind turbines from the project.

- Updated project information shared with the wider community with an information newsletter distributed
 in November 2018 to over 300 properties around the vicinity of the project site, to provide updated
 information about status, progress and key project elements and to invite feedback and participation in
 forthcoming community information sessions.
- Community Consultative Committee meeting in late November 2018, incorporating discussions about the status, progress and key project elements being addressed by the Plan.
- The draft Plan was subsequently shared with all CCC members in early Jan 2019, with the CCC role in Condition B 27 highlighted, requesting review, comment and feedback. This role and input was reemphasised in early Feb 2019, prior to the CCC meeting held on 27 Feb 2019. There was very limited feedback from the CCC either prior to, or at, the CCC meeting, with the primary response focused on the potential for aviation safety lighting. The proponent was able to reassure the CCC that there will be no aviation lighting, based on the response received from CASA on 31 Oct 2018 which stated that "aviation lighting is not required for this proposed wind farm".

- The staged development nature of this Plan will allow for ongoing discussions with the CCC and further comment / input / refinement into subsequent stages of the Plan.
- Community Information Sessions held in the village of Collector, in late Nov 2018 and in late Mar 2019, as
 advertised by project newsletters distributed across the local area. These offered the opportunity for
 interested residents to meet the project team and find out further details about the project and its
 progress. In particular these sessions provided the opportunity for those identified residents to discuss
 potential measures to address visual significance issues.
- Presentation to the Collector Community Association in mid-December to present updated status, progress and key project elements being addressed, again offering the opportunity for local residents to discuss issues around visual issues.

There has been very limited response to the engagement activities undertaken through September 2018 to March 2019, with two residents (to the west and south-west of the project) requesting further work to assess potential visual impacts and proposed mitigation measures. Site visits were carried out to both locations in mid-Apr 2019 and proposals for work will be shared in May with implementation to follow as soon as possible. Outside of this, and the limited comments from the CCC, there has been no specific responses, feedback or comment to date from any of the residents or businesses identified in the original LVIA in regards to screening or other visual mitigation measures.

It is also noted that the original LVIA concluded that no land under public authority ownership would be subject to medium or higher visual impacts and hence no measures would be required for land within their ownership. Extensive engagement is maintained with the Upper Lachlan Shire Council, particularly in regards to issues around Lerida Road South that runs through the site, and there has been no suggestion of the need for any landscape works additional to those that will be undertaken when the road is upgraded.

Notwithstanding this limited response to date to the ongoing consultation activities, work on the detail design development for on-site landscape works and identification of areas for landscape planting to mitigate views toward some wind farm constructed elements has been progressed, as presented in this report.

The results of on-going community consultation activities throughout the construction of the project will be incorporated into further stages of this DLP as it is further developed, and will inform further refinements of the on-site landscape planting strategy.

Section 3 Wind Farm materials, finishes, treatment and lighting

3.1 Introduction

The CWF CoA Condition B27 (b) relates to the design of the wind farm and treatment of materials used to minimise visual impact. The following table outlines the key structures associated with the wind farm and their materials, finishes and treatments.

Table 2 - Schedule materials, finishes and treatments

Key structure	Element and materials	Finish	Treatment
Wind turbine	Tower: Tapered tubular steel Blades: Composite glass fibre	Painted: matt -off- white/grey (Condition B23)	Blades anti glare No advertising or logos.
Wind turbine access steps and landings	Structural steel	Galvanised	None
Wind monitoring towers	Tower: Steel tube Guy wires: Steel	Wind monitoring towers to be finished according to the requirements set out in MOS 139 Section 8.10 Obstacle Markings.	In accordance with MOS 139 Section 8.10 Obstacle Markings.
Wind turbine access roads	Unsealed dirt road in accordance with ARRB Unsealed Road Manual 2009.	Access roads shall be constructed with locally sourced materials where available.	None
Substation/switchyard	Various internal electrical components: a single storey control building switch bays and transformers a communication pole lightning masts water tank security fencing including a palisade fence and internal chainmesh fence. Internal electrical components as per TransGrid specifications Perimeter fence: Steel	Internal electrical finishes as per TransGrid specifications Fencing: painted/powder coated with a dark and visually recessive colour.	As per Condition B25, minimise glare and reflection.
High voltage transmission line	Support structure: Steel Insulators: Polymer Conductor: Aluminium alloy	None None None	None
Operations and Maintenance Building	Single or separate buildings: Predominantly steel wall/roof structures	Painted: Pale Eucalypt, Paperbark and Mangrove (Colourbond range – or equivalent).	None

The CWF CoA Condition B27 (b) also relates to landscape elements, and the application of natural landscape features, such as topography, to screen some built elements of the wind farm. Whilst the location of built elements is largely determined by functional engineering requirements, the position of wind turbine access tracks and the substation/switchyard facility has taken advantage of low hills and ridgelines to minimise visual

impacts from sensitive receiver locations. In particular, the design for the project substation will see it located below the crest of the hill, as part of the 'cut and fill' balance for the earthworks, and hence it will be partially shielded to views from the east, south and west by the natural landform.

3.2 Lighting

Table 3 outlines the requirement for lighting installations associated with the wind farm development. Whilst the majority of the wind farm will not require lighting installations, any light fittings to be installed shall be in accordance with the Australian Standard *'Control of the obtrusive effects of outdoor lighting'* (AS4282-1997)

Table 3 – Lighting

Key structure	Lighting requirements
Wind turbine	No significant lighting requirement.
	Low intensity lighting may be installed above doorway entrance into tower.
	The low intensity light would only be activated to enter turbine at night as
	and when required.
Wind monitoring towers	No lighting requirement.
Kiosk transformer	No lighting requirement.
Wind turbine coolers	No lighting requirement.
Wind turbine access steps and landings	No lighting requirement.
Access roads	No lighting requirement.
Substation/switchyard	Lighting will be installed in the control room, substation and switchyard
	areas, to be available if / when these are accessed at night time, as
	standard for TransGrid grid infrastructure installations around NSW. The
	substation will not be manned at night during normal operations.
	Emergency lighting will be installed to enable emergency maintenance
	operations to be undertaken safely at night time.
	All lighting will be directional and shielded installations in accordance with
	the Australian Standard 'Control of the obtrusive effects of outdoor lighting'
	(AS4282-1997).
	Specific lighting detail will be determined during the substation/switchyard
	detailed design phase.
High voltage transmission line	No lighting required.
Operations and Maintenance	Lighting will be required within and around the Operations and
Building	Maintenance Building with directional and shielded lighting installations to
	be installed in accordance with the Australian Standard 'Control of the
	obtrusive effects of outdoor lighting' (AS4282-1997).

The specific location and type of lighting to be installed at the wind farm substation/switchyard will be determined during the detailed design of the substation/switchyard and described in the Detailed DLP Design Report.

Section 4 On-site landscape works

4.1 Introduction

There is limited opportunity for on-site landscape planting to provide feasible screening toward some elements of wind farm infrastructure including large scale elements such as the wind turbines. A number of smaller wind farm elements will be screened by existing landform and/or tree cover within the wind farm site boundary.

Table 4 outlines key wind farm infrastructure and built elements together with a consideration of on-site landscape planting and its potential efficacy to screen views from residential dwellings with moderate to high visual impacts.

Table 4 – Wind Farm infrastructure and screening feasibility

Wind Farm infrastructure key elements	On site screening feasibility	Notes
Wind turbine	None	Screening of wind turbines through on-site landscape
		works are not considered feasible. Views toward wind
		turbines may mitigated through off-site landscape
		works where planting is located in greater proximity to
		the view location.
Wind monitoring tower	None	Screening of wind monitoring towers through on-site
		landscape works are not considered feasible. Views
		toward wind turbines may mitigated through off-site
		landscape works where planting is located in greater
		proximity to the view location. Wind monitoring towers
		are not considered to be visually dominant structures.
Access roads	Yes	On-site landscape works may assist in mitigating views
		toward internal access roads; however, the access roads
		are not considered to be visually dominant features
		within the landscape.
Substation/switchyard	Yes	On-site landscape works may assist in mitigating views
		toward electrical infrastructure such as substation and
		support towers within the wind farm site.
Operations and	Yes	On-site landscape works may assist in mitigating views
Maintenance Building		toward small scale buildings within the wind farm site.

On-site landscape planting plans will be developed in association with on-going detailed planning of the wind farm site as well as further community consultation activities with neighbouring properties. Draft on-site landscape planting plans will be included in the DLP Detailed Design Report.

4.2 Planting schedule

A list of trees and shrub species have been compiled for the purpose of on-site landscape works. Nominated native tree planting has been sourced from the ngh Biodiversity Assessment Collector Wind Farm May 2012 and the NSW Department of Environment and Heritage, Bioregions of NSW, South Eastern Highlands Bioregion:

https://www.environment.nsw.gov.au/resources/nature/southEasternHighlands.pdf

Table 5 – Planting schedule

Scientific name	Common name	Mature height (m)	Pot size	Plant spacing	Quantity
TREES					
Eucalyptus dives	Broad-leaved Peppermint	up to 20	Tube	To be confirmed in the DLP Detailed	To be confirmed in the DLP Detailed
E. blakelyi	Blakely's Red Gum	up to 25	Tube	Design Report	Design Report
E. bridgesiana	Apple Box	up to 20	Tube		
E. macroryncha	Red Stringybark	up to 20	Tube		
E. mannifera	Brittle Gum	up to 25	Tube		
E. melliodora	Yellow Box	up to 20	Tube		
SHRUBS					
Acacia dealbata	Silver Wattle	up to 8	Tube		
Acacia deanei	Deane's Wattle	up to 7	Tube		
Acacia falciformis	Broad leaved hickory	up to 8	Tube		
Acacia implexa	Hickory Wattle	up to 12	Tube		
Bursaria spinosa	Native Blackthorn	up to 5	Tube		
Kunzea ericoides	Burgan	up to 4	Tube		

Planting types and species may be updated to reflect discussions with associated and non-associated property owners with regard to site specific requirements and planting practicalities. Plant spacings and quantities will be confirmed in the Detailed DLP Design Report to address specific planting areas, screening objectives and individual requirements of residential dwelling owners.

4.3 Timing and implementation for on-site landscape works

The timing and implementation of on-site landscape works shall be coordinated with the wind farm construction program and staging. The implementation of on-site landscape works is not to occur in areas that are likely to be subject to future earthworks or construction activities. However, site landscape works will commence as soon as possible after construction works have been completed and integrated with site rehabilitation works that will stabilise disturbed areas and commence revegetation.

Additional to the above, the optimal timing and program for installation of on-site landscape works (including tree and shrub planting) are to consider the schedule outlined in **Table 6** where possible.

Site preparation and planting works may occur outside of this optimal period; however planting and successful establishment may be subject to favourable ground and climate conditions. To facilitate successful plant establishment:

- groundwork and site preparation are not to be carried out whilst site conditions are subject to water logging or excessive soil moisture
- plant installation is not to occur during cold periods or at times when frost is likely to occur before or following planting
- plant installation is not to occur during periods of extreme heat.

Table 6 – On-site landscape works, timing and implementation

			Tasks		
		Site selection and initial preparation:	Maintain site	Planting preparation	Planting
	March to April 2019	Remove and isolate livestock from site Initial herbicide treatment Deep rip to 500mm			
ρ 0	May to		Keep out livestock		
Timing	June 2019		Weed removal Leave fallow over winter		
-	July 2019			Order plant stock and materials	
	August to				Herbicide
	September				Cultivate planting
	2019				area Install planting

Tasks to be undertaken with regard to on-site landscape works may be subject to adjustments in timing depending on seasonal climatic conditions.

4.4 Inspection of landscape works

An inspection program for all planting areas shall be implemented. Site inspections shall be carried out at 3 monthly intervals for the duration of the 24-month maintenance period. The site inspections will determine and verify the establishment and growth of plantings, as well as the state of associated fencing and/or plant protection measures. A number of typical locations shall be identified to photograph the landscape works at each 3 monthly site inspection. These locations shall be re-photographed during each site inspection and provided to DPE together with a summary report on the establishment and growth of planting at 6 monthly intervals during the maintenance period.

4.5 Maintenance

All areas subject to landscape works shall be inspected to identify any required actions during the maintenance period. **Table 7** outlines the key elements to be inspected and tasks to be undertaken during the maintenance period.

Table 7 – Landscape maintenance tasks

Landscape element	Maintenance action
Planting	Inspection:
	Check for dead or missing plants
	Check for pest damage
	Action:
	Replace missing or dead plants with the same species type and size
	as originally installed
	Identify pest (insect/vertebrate) and action accordingly
Weeds	Inspection:
	Check planting area for weed growth and or infestation
	Action:
	Undertake weed control
Fences	Inspection:
	Check for any damage
	Action:
	Make repairs as necessary
Stakes and tree guards	Inspection:
	Check for any damage and/or missing stakes or tree guards
	Action:
	Make repairs and/or replace as necessary

4.6 Outcome based plant establishment

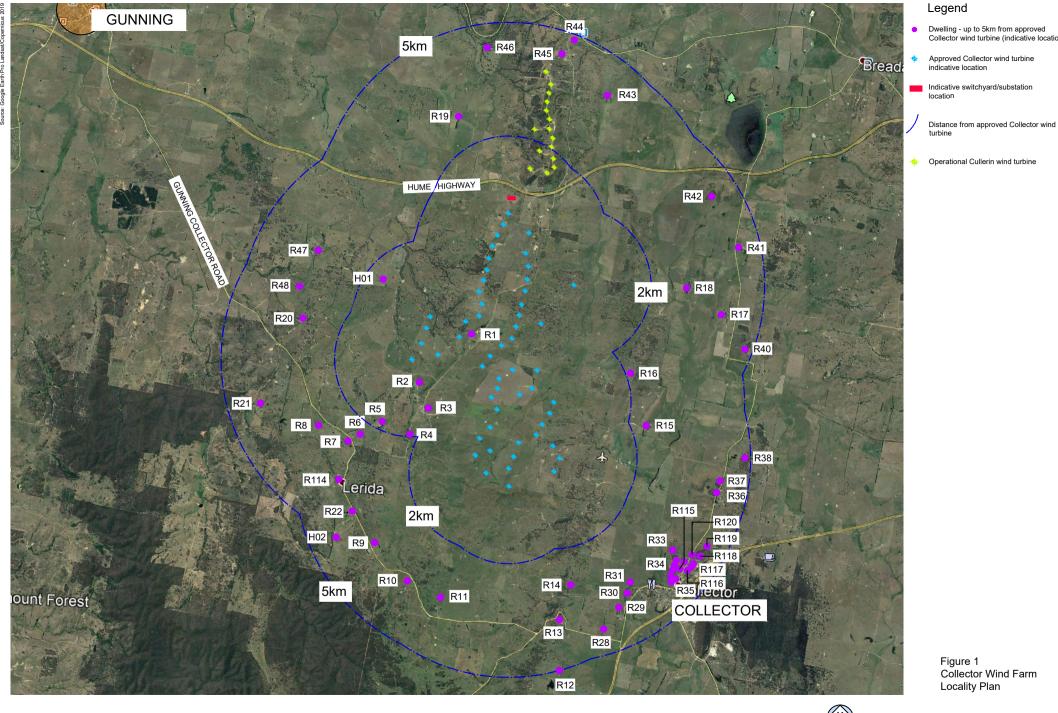
At the completion of the 24-month maintenance period a final site inspection shall be carried out to review and verify successful plant establishment. Successful plant establishment will be determined by not less than 90% of plants being recorded as established across all on-site landscape planting areas.

Where planting areas contain less than 90% of established plants the following actions will be undertaken:

- All missing or dead plants shall be replaced with the same species and sizes as originally installed.
- Where plants have visibly not achieved a rate of growth consistent with the majority of same plant species, these plants shall be removed and replaced with the same plant species and size as originally installed.

Where areas of planting are considered to have been impacted by actions and/or conditions beyond the control of the Proponent (such as inadvertent slashing or errant herbicide spraying by the landowner) or severe weather events (such as extreme and prolonged heat), then measures shall be discussed with DPE to resolve any residual impact and/or seek alternative approaches to achieve the requirements of the relevant CoA.

Figure 1 Preliminary DLP Wind Farm Locality



2km

Collector Wind Farm