



Appendix BB

| *Landscape and visual
impact assessment*

WOODLAWN ADVANCED ENERGY RECOVERY CENTRE

LANDSCAPE AND VISUAL IMPACT ASSESSMENT

Prepared for:



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Glossary

This Visual Impact Assessment has adopted the following definitions from *Guidelines for Landscape and Visual Impact Assessment* (2013) and the Transport for NSW (TfNSW) *Guideline for Landscape Character and Visual Impact Assessment, Environmental Impact Assessment Practice Note EIA-N04* (July 2020).

Table 1 Glossary

Cumulative effects	<i>The summation of effects that result from changes caused by a development in conjunction with other past, present or reasonably foreseeable actions.</i>
Indirect Impacts	<i>Impacts on the environment, which are not a direct result of the development but are often produced away from it or as a result of a complex pathway.</i>
Landscape character	<i>The combined quality of built, natural and cultural aspects which make up an area and provide its unique sense of place.</i>
Magnitude	<i>The measurement of scale, form and character of a development proposal when compared to the existing condition. In the case of visual assessment this relates to how far the proposal is from the viewer. Combined with sensitivity, magnitude provides a measurement of impact.</i>
Mitigation	<i>Measures, including any processes, activity or design to avoid, reduce, remedy or compensate for adverse landscape and visual effects of a development project.</i>
Photomontage (Visualisation)	<i>Computer simulation or other technique to illustrate the appearance of a development.</i>
Sensitivity	<i>The sensitivity of a landscape character zone or view and its capacity to absorb change. In the case of visual impact this also relates to the type of viewer and number of viewers. Combined with magnitude, sensitivity provides a measure of impact.</i>
Visibility	<i>The state or fact of being visible or seen.</i>
Visual Absorption Capacity	<i>The degree to which a particular landscape character type or area can accommodate change without unacceptable adverse effects on its character.</i>

Table 1 Glossary

Visual amenity	<i>The value of a particular area or view in terms of what is seen.</i>
Visual impact	<i>The impacts on the views from residences, workplaces, and public places.</i>
Visual Impact Assessment	<i>A process of applied professional and methodical techniques to assess and determine the extent and nature of change to the composition of existing views that may result from a development.</i>
View location	<i>A place or situation from which a proposed development may be visible.</i>
Visual receiver	<i>Individual and/or defined groups of people who have the potential to be affected by a development.</i>

Table 2 Abbreviations

AHD	<i>Australian Height Datum</i>
APCr	<i>Air pollution control residues</i>
ARC	<i>Woodlawn Advanced Energy Recovery Centre</i>
Bioreactor	<i>Woodlawn Bioreactor</i>
DPIE	<i>Department Planning, Industry and Environment</i>
Eco Precinct	<i>Woodlawn Eco Precinct</i>
ED	<i>Evaporation Dam</i>
EIS	<i>Environmental Impact Statement</i>
km	<i>Kilometres</i>
LVIA	<i>Landscape and Visual Impact Assessment</i>
m	<i>metres</i>
MBT	<i>Woodlawn Mechanical Biological Treatment Facility</i>
SEARs	<i>Secretary's Environmental Assessment Requirements</i>

Section 1 Introduction

1.1 Introduction

Green Bean Design Pty Ltd (GBD) was commissioned by EMM Australia Pty Ltd (EMM) on behalf of Veolia Environmental Services (Australia) Pty Ltd to prepare a Landscape Visual Impact Assessment (LVIA) for the proposed Woodlawn Advanced Energy Recovery Centre (ARC) (the project) located at the Woodlawn Eco Precinct (the Eco Precinct).

This LVIA has been prepared to support an application for development consent under Part 4, Division 4.7 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). The project has been classified as a State significant development (SSD) under the EP&A Act as it is development that requires consent and is a type of development listed in Schedule 1 of the State Environmental Planning Policy (Planning Systems), 2021 and namely meets the definition of both ‘electricity generating works and heat or co-generation’ (section 20) and ‘waste and resource management facilities’ (section 23) under Schedule 1.

1.2 SEARs and LVIA key objectives

This report has been prepared to address the Secretary’s environmental assessment requirements (SEARs) (SSD-21184278) for the project, issued on 2 July 2021. The requirements that are relevant to visual impacts, and where they have been addressed in this report, are summarised in the table below.

Table 3 - Response to SEARs

SEARs	LVIA reference
Visual – a visual impact assessment (including photomontages and perspectives) of the development layout and design (new infrastructure and storage areas),	Section 4 Project overview Section 9 Photomontage Figure 17 Photomontage PM1 Figure 18 Photomontage PM2
consideration of staging, end of life and decommissioning	Section 4 Project overview
an assessment of cumulative impacts with existing site infrastructure	Section 10 Cumulative visual impacts
an assessment of any potential impacts on nearby public and private receivers and significant vantage points (including M23 Federal Highway and Weereewa Lookout) in the broader public domain	Section 7 Viewshed Section 8 Visual Impact Assessment Figure 13, Photo sheet 5

A key objective of this LVIA is to determine the likely visual significance of the project on people living and working in or travelling through the landscape within and surrounding the Eco Precinct. This LVIA has also been undertaken to:

- assess the existing landscape character surrounding the project
- determine the extent and nature of the project's potential significance on surrounding visual receivers and
- identify measures to mitigate and minimise adverse visual impacts.

Section 2 LVIA methodology

2.1 LVIA guidance

This LVIA has been prepared with reference to standard industry guidelines including:

- *Guideline for landscape character and visual impact assessment, Environmental impact assessment practice note EIA–N04, Centre for Urban Design, TfNSW Version 2.2, July 2020 (Practice note – N04)*
- *Guidelines for Landscape and Visual Impact Assessment* (Landscape Institute and Institute of Environmental Management & Assessment 2013).

2.2 LVIA methodology

The LVIA methodology included the following activities:

- detailed desktop review addressing visual character and identification of view locations within the surrounding area
- site photography
- assessment of the project's visual impact and
- identification of recommended mitigation measures.

2.2.1 Desktop review

A detailed desktop review was carried out to identify an indicative visual study area for the ARC and APCr encapsulation cell. This was carried out by reference to topographic maps as well as aerial photographs of the Eco Precinct location and surrounding landscape.

Topographic maps and aerial photographs were also used to identify the locations and categories of potential view locations that could be verified during the fieldwork component of the assessment. The desktop review also outlined the visual character of the surrounding landscape including features such as landform, elevation, land use and the distribution of dwellings.

2.2.2 Site photography

The site photography involved:

- desktop determination and confirmation of the various view location categories and receiver locations from which the project could potentially be visible
- site visit to capture photographic aerial and ground imagery of the Eco Precinct and surrounding landscape.

2.2.3 Assessment of visual impact

The level of visual impact that may result from the construction and operation of the project has been determined by combining the assessment and determination of surrounding receiver sensitivity and the

magnitude of the project when compared to the existing visual environment. The assessment of visual impact has been determined in accordance with *Practice note – N04*.

The determination of visual impact is also subject to other factors which are considered in more detail in this LVIA.

2.2.4 Mitigation measures

A number of mitigation measures have been recommended to assist in the reduction and, where possible, minimisation of any minor visual effects on surrounding receiver locations.

Section 3 Eco Precinct and study area

3.1 Eco Precinct location

Veolia Environmental Services (Australia) Pty Ltd (Veolia) owns and operates the Woodlawn Eco Precinct (the Eco Precinct), located on Collector Road, approximately 6 kilometres (km) west of Tarago, approximately 50 km south of Goulburn and 70 km north of Canberra. The Eco Precinct is in the Goulburn Mulwaree local government area (LGA).

The project study area is part of Veolia's integrated waste management operations. The Woodlawn Mine is immediately to the east of the ARC. Veolia's landholdings, including the broader Eco Precinct area and Pylara Farm as shown in **Figure 2**, provide a buffer between operations and surrounding private properties. The project study area has been subject to disturbance associated with historic and current mining operations and integrated waste management operations.

The Eco Precinct location is illustrated in **Figures 1 and 2**.

3.2 Eco Precinct description

The Eco Precinct comprises the following integrated waste management operations, energy recovery technologies and energy generation, and other sustainable land uses, including the following:

- Woodlawn Bioreactor (the Bioreactor) – a putrescible residual waste landfill in which leachate is recirculated to help bacteria break down the waste, enhancing the early generation, capture and extraction of landfill gas, including leachate and landfill gas management systems
- Woodlawn BioEnergy Power Station – utilises landfill gas from the Bioreactor to generate electricity
- Woodlawn Mechanical Biological Treatment (MBT) Facility – extracts the organic content from a portion of the MSW for use in tailings dam remediation
- Agriculture – includes a working farm that applies sustainable management practices
- Aquaculture and horticulture – use of captured waste heat from the BioEnergy Power Station for use in sustainable fish farming and hydroponic horticulture at the Eco Precinct
- Renewable energy generation – the Woodlawn Wind Farm (operated by Iberdrola) which has an installed capacity of 48.3 MW, and a solar farm with installed capacity of 2.3 MW.

The Eco Precinct is served by the Crisps Creek intermodal facility (IMF) near the village of Tarago. The Crisps Creek IMF is located approximately 8.5 km to the east of the Eco Precinct (by road). Operations are augmented by two waste transfer terminals located in Sydney; the Clyde Transfer Terminal, which commenced operation in 2004 with the Bioreactor and Crisps Creek IMF, and the Banksmeadow Transfer Terminal, which commenced operating in 2016.

Waste is transported from the Sydney transfer terminals in purpose-built shipping containers by rail on the Goulburn-Bombala Railway line to the Crisps Creek IMF from the Eco Precinct. At the Crisps Creek IMF the containers are loaded on to trucks for delivery to the Eco Precinct.

Veolia proposes to develop and operate the ARC, an energy recovery facility (ERF), at the Eco Precinct. This involves the development of an additional waste management technology at the Eco Precinct, treating a portion of the waste stream which is already approved to be received as part of integrated waste management operations, and recovering energy from the process.

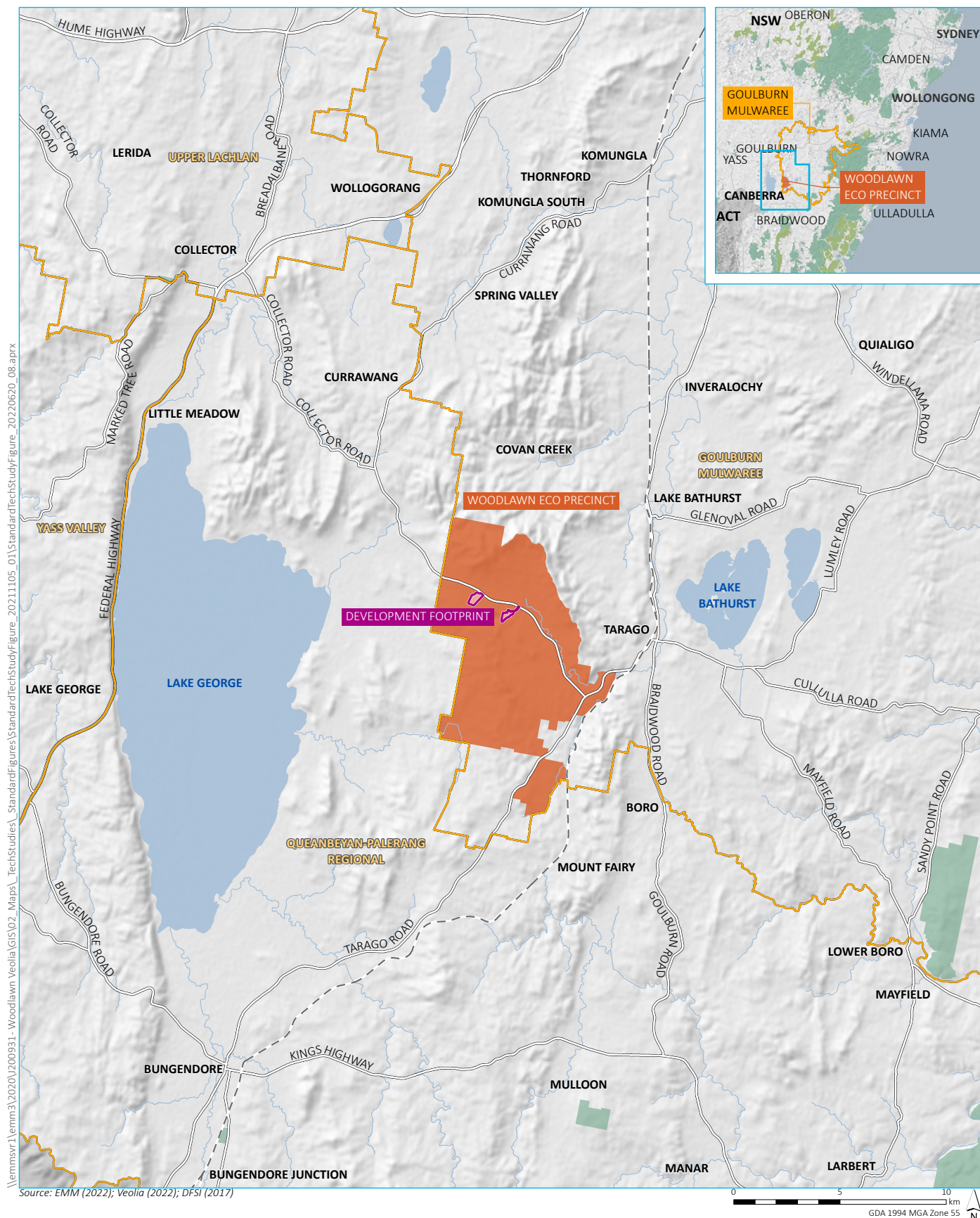
3.3 Study area

The development footprint for the project represents the extent of surface disturbance proposed and assessed in the EIS. All works and disturbance for the project will occur within the development footprint and include:

- the ARC – portion of the development footprint encompassed by the main ARC building and ancillary infrastructure, IBA area and new access road and intersection. This area currently contains former mine plant infrastructure, water management infrastructure (plant collection dam) and other disturbed areas used for area subject to ancillary waste management operations. Reference to the ARC also incorporates the stack structure extending 30m above the ARC building roof
- encapsulation cell – the area encompassed by the dedicated lined and engineered cells for the encapsulation of stabilised air pollution control residues (APCr) from the flue gas treatment system. This area is disturbed and currently comprises water management infrastructure (Evaporation Dam 1, known as ED1).

For the purpose of this LVIA, reference to the ARC incorporates the ARC building, stack structure (extending 30m above the ARC building roof) and the IBA area. The IBA area would be located to the west and south west of the ARC building and between the ARC building and the Woodlawn Bioreactor.

The ARC and encapsulation cell development footprints are illustrated in **Figure 3**.

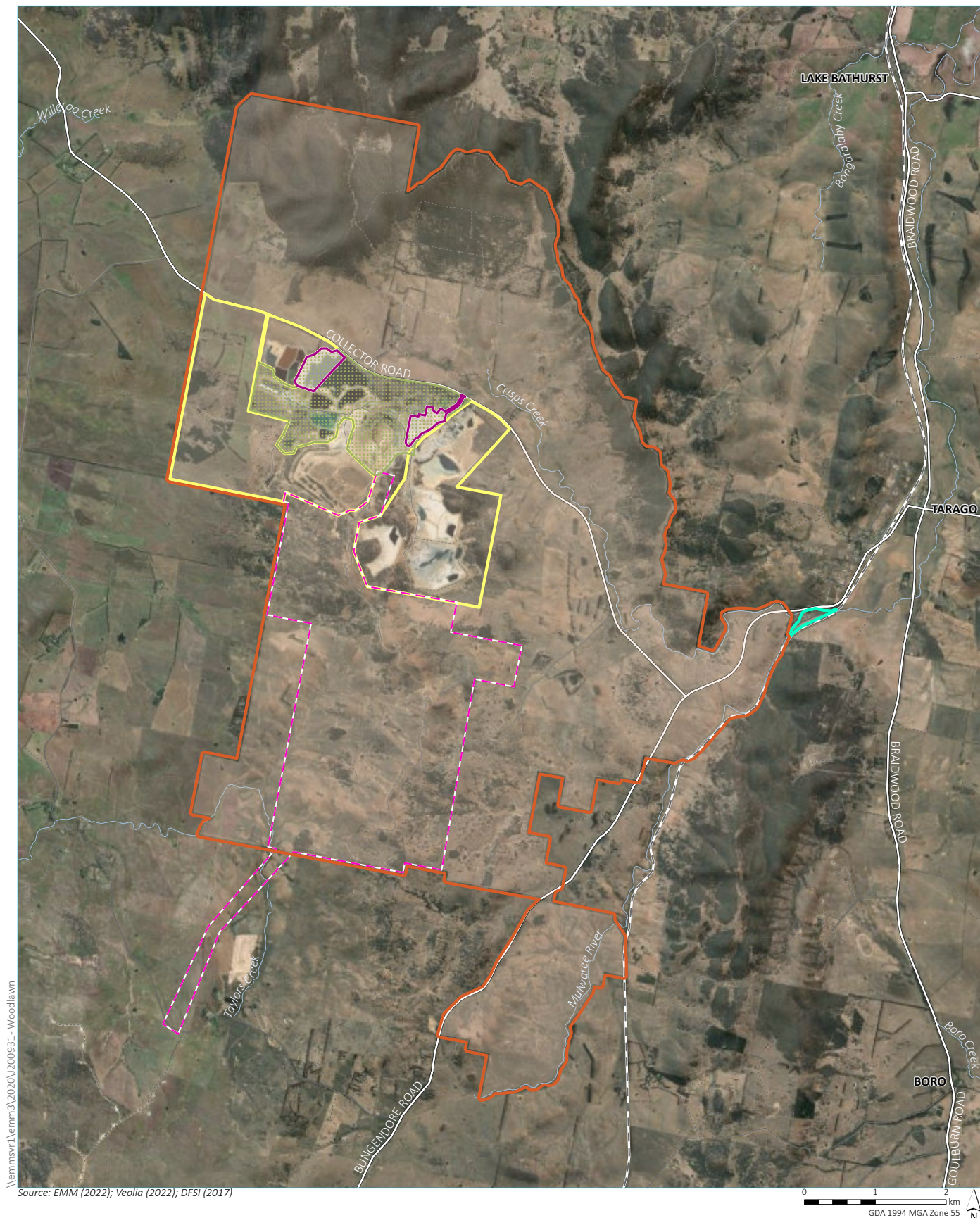


KEY

- Development footprint
- Woodlawn Eco Precinct
- Rail line
- Major road
- Watercourse
- Named waterbody
- NPWS reserve
- Local government area

Figure 1
Regional setting

Woodlawn Advanced Energy Recovery Centre
Environmental impact statement



KEY

- Development footprint
- Veolia integrated waste management operations
- Woodlawn Eco Precinct
- Crisps Creek Intermodal Facility (IMF)
- Woodlawn Mine operations area
- Woodlawn Wind Farm

- Rail line
- Major road
- Minor road
- Vehicular track
- Watercourse

Figure 2
Local setting

Woodlawn Advanced Energy Recovery Centre
Environmental impact statement

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- KEY
- Development footprint
 - Veolia integrated waste management operations
 - Woodlawn Eco Precinct
 - Woodlawn Mine operations area
 - Woodlawn Wind Farm
 - APCr transport route
 - Major road
 - Minor road
 - Vehicular track
 - Watercourse

Project layout

Woodlawn Advanced Energy Recovery Centre
Environmental impact statement



Source: EMM (2022); Veolia (2022); DFSI (2017)

Section 4 Project overview

4.1 Project overview

The project involves development and operation of the ARC and supporting infrastructure at the Eco Precinct. The following table captures the main elements of the project.

Table 4 – Key project elements and supporting infrastructure

Project element	Summary of the project
The ARC building	The ARC building housing the energy recovery plant and ancillary infrastructure.
Ancillary infrastructure	Ancillary infrastructure including: <ul style="list-style-type: none"> • container receipt, handling and temporary storage areas located in the immediate vicinity of the ARC building • administration and education building • landscaping • sub-contractors area • utilities and services, comprising a new substation and • IBA transfer conveyor.
Incinerator bottom ash (IBA) area and handling equipment (IBA area)	Ash management infrastructure for the IBA.
Encapsulation cell and leachate evaporation pond	Staged construction of a dedicated lined and engineered landfill cell for encapsulation of the residual by-products from the flue gas treatment system (the encapsulation cell), and leachate evaporation pond to manage leachate from the encapsulation cell.
Transport and access	The project will involve the construction and operation of: <ul style="list-style-type: none"> • new site access road and intersection with Collector Road • internal access roads, car and bus parking facilities • the container receipt and storage area and • weighbridges for inbound and outbound vehicles.

4.2 The ARC building

The ARC building will house the main energy recovery plant and will be fully enclosed. The building has been designed to fit within the surrounding landscape and environment. The ARC building is illustrated in Plates 1 and 2. The ARC building would include a cylindrical stack around 3m wide, extending to around 864.3m AHD (30m above the ARC building maximum roof height).

4.3 IBA area

The IBA area will consist of:

- the IBA processing building
- IBA maturation pad and stockpiles and
- associated infrastructure for wastewater and leachate management.

4.4 Encapsulation cell

The encapsulation cell will be constructed in stages over a period of approximately 25 years.

The encapsulation cell is wholly within the footprint of an existing evaporation dam, ED1, within Veolia's integrated waste management operations area, and approximately 1.8 km from the ARC building. The existing ground surface elevation in the proposed location of the encapsulation cell is generally between approximate RL 785 m to 790 m.

The encapsulation cell will be progressively filled from south to north to a final landform with a maximum height at approximately RL 815 m (approximately 30 m above the immediately surrounding ground level). The final landform has been developed with shallower final slopes on the north and east batters to reduce visual impact, refer Figure 18 Photomontage PM2.

The ARC building and the encapsulation cell locations are illustrated in Figures 4 and 5.

4.5 Project staging

The construction of the project is expected to be undertaken over a period of three years and staging is likely to include:

- Initial site preparation works, establishment of construction access roads, compounds and laydown areas and other infrastructure and utilities (6 months)
- Construction and erection of the new EfW building and equipment as well as associated site infrastructure including on site landscape works (2 years)
- Commissioning and testing (9 months)
- Demobilisation (2 months) and
- Availability testing, completed during operational phase (12 months).

4.6 Decommissioning

For the purposes of the EIS, the encapsulation cell has been based on a 25-year operational life. Lower annual throughputs would mean the encapsulation cell would provide storage capacity for stabilised APCr in excess of 25 years. Once capped and rehabilitated, the encapsulation cell is intended to remain in situ and will be integrated into final land use planning for the broader Eco Precinct. Decommissioning and/or future use of ARC project infrastructure and final land use planning for the encapsulation cell will be integrated into Veolia's LCRMP (Veolia 2016). The LCRMP outlines Veolia's approach to rehabilitation of areas generally covered under its development consent (DA 31-02-99 and MP 10_0012, as modified).

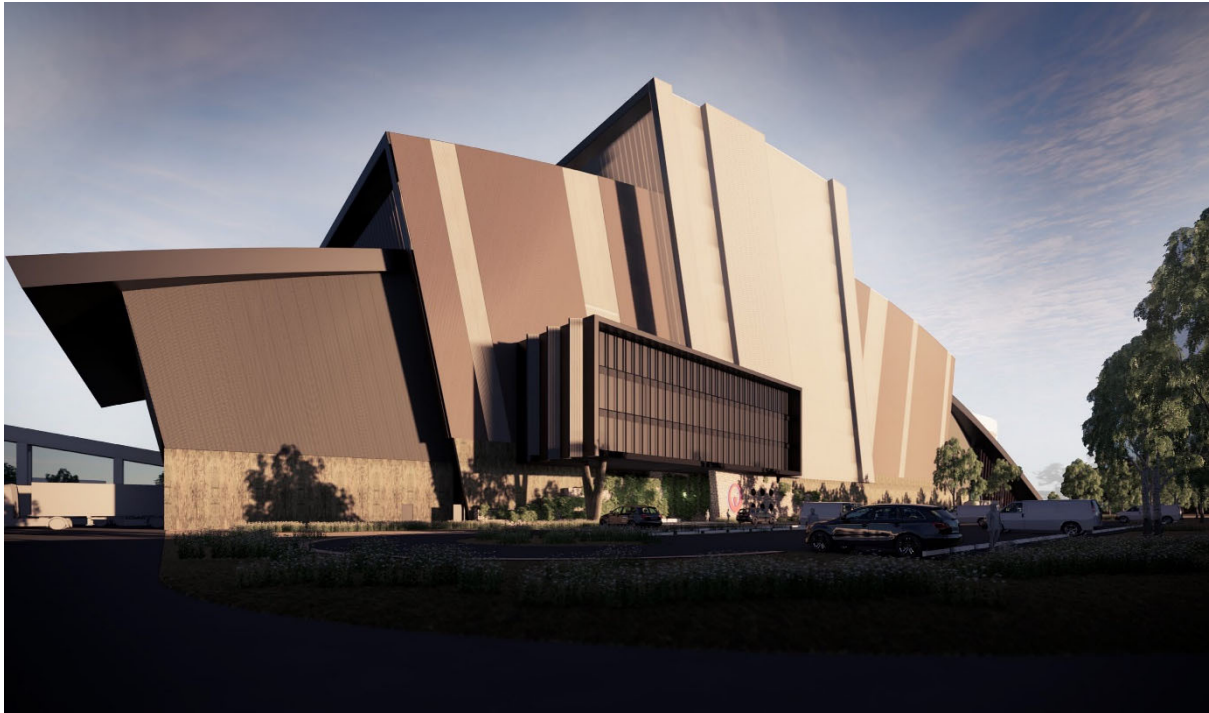


Plate 1 Perspective view north toward the ARC building (source: nettletontribe Design Report June 2022)

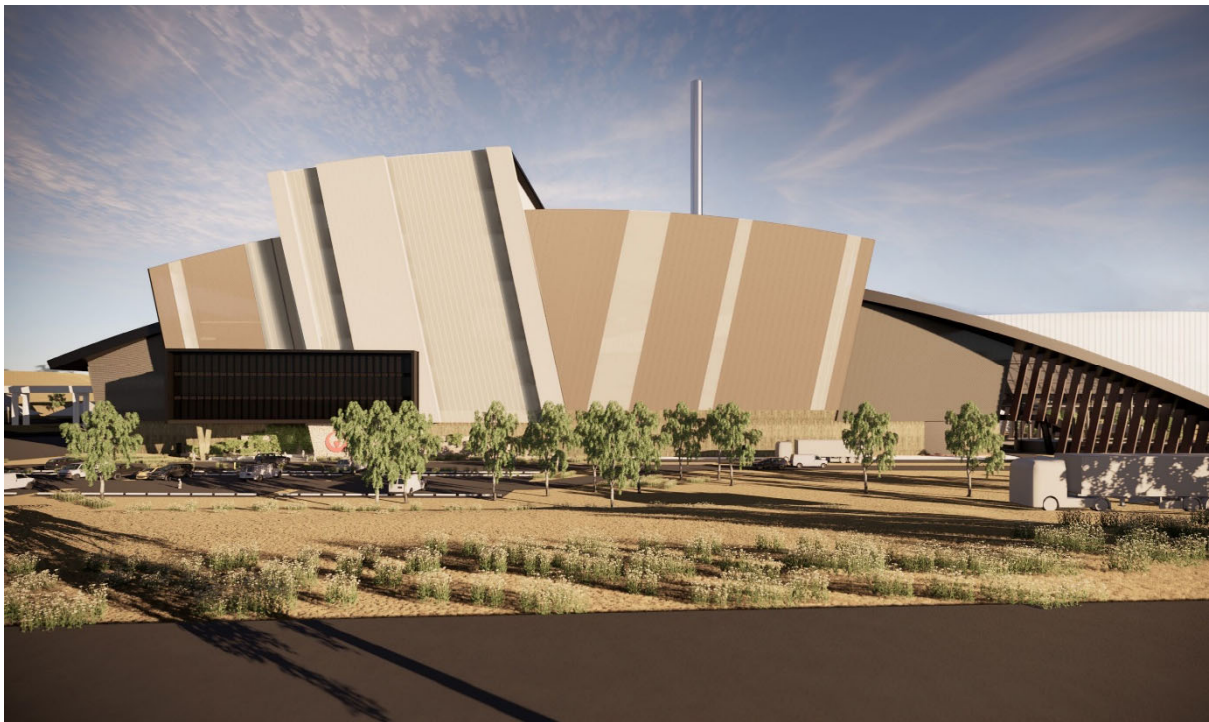


Plate 2 Perspective view north west toward the ARC building (source: nettletontribe Design Report June 2022)



Plate 3 ARC building east elevation (source: nettletontribe Design Report June 2022)

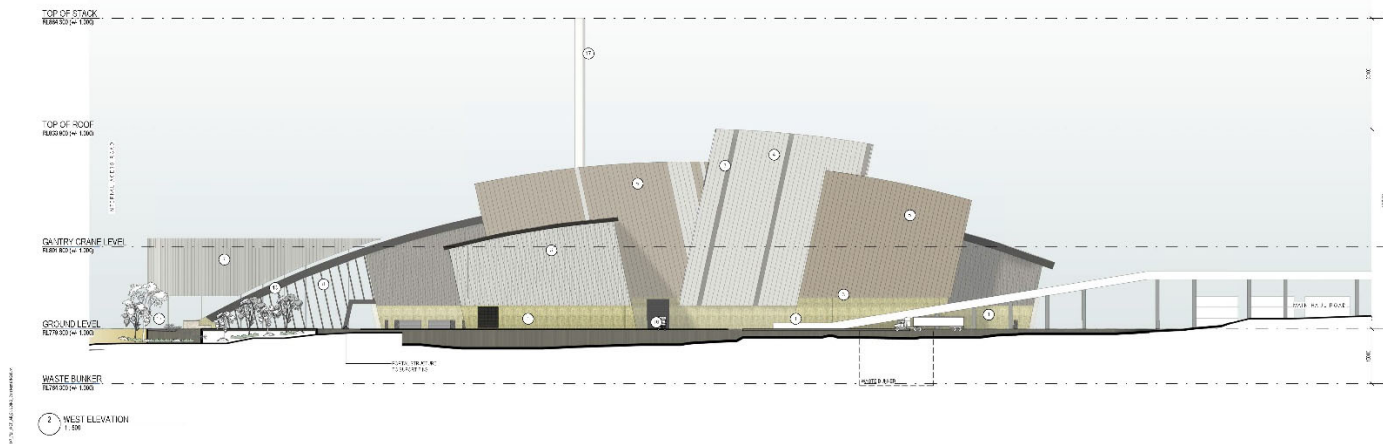


Plate 4 ARC building west elevation (source: nettletontribe Design Report June 2022)

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KEY

- Development footprint
- Site layout detail
- Mezzanine level 1
- Mezzanine level 2

Proposed operations

- 1 Existing Woodlawn substation
- 2 Existing plant collection dam (PCD)
- 3 HV connection point
- 4 Existing Woodlawn bioenergy power station
- 5 ARC substation
- 6 Existing hub 2 power station expansion
- 7 Stormwater retention dam
- 8 Outbound weighbridge
- 9 Sub-contractors area
- 10 Air cooled condenser (ACC)
- 11 Store
- 12 Fire water tanks
- 13 Turbine hall
- 14 APCr stabilisation plant
- 15 Stormwater settling pond
- 16 Waste water irrigation
- 17 Flue gas treatment (FGT)
- 18 Maintenance access corridor
- 19 Workshop
- 20 Boiler hall
- 21 Incoming weighbridge
- 22 Waste bunker
- 23 Entry and reception
- 24 IBA conveyor
- 25 Tipping hall
- 26 Bus dropoff
- 27 IBA area
- 28 Carpark
- 29 Container marshalling area
- 30 IBA processing building
- 31 Diesel tanks
- 32 Raw water feed tank
- 33 Office and administration (Mezzanine level 1)
- 34 Central control room (CCR) (Mezzanine level 2)
- 35 Administration and education area (CCR) (Mezzanine level 2)

Figure 4
ARC building, IBA area and
ancillary infrastructure

Woodlawn Advanced Energy Recovery Centre
Environmental impact statement



Source: EMM (2022); Veolia (2022); DFSI (2017)



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KEY

- Development footprint
- APCr transport route
- Encapsulation cell
- Leachate evaporation pond
- Major road

Figure 5
The encapsulation cell

Section 5 Site photographs

5.1 Panoramic photographs and aerial images

A series of individual and panorama digital photographs and aerial images were taken during the site inspection to illustrate existing views near the Eco Precinct and to give a sense of the overall site in its setting. The panorama photographs were digitally stitched together forming a segmented panorama image to provide a visual illustration of the existing view from each photo location.

The panorama photographs were taken with a Canon EOS 5D Mk IV digital SLR camera with a full frame sensor and a prime 50 mm focal length lens. The photographs were taken as a combination of handheld and tripod mounted images; however, all photographs for the purpose of photomontages were taken with the camera tripod mounted with additional GPS data recorded together with start and end bearings for each panorama.

The aerial photos were taken with a DJI Mavic Spark, flown to a maximum height of 120 m above ground level in accordance with Civil Aviation Safety Authority requirements. The aerial photos provide extensive views and vistas that are not available from ground level due to tree cover within and surrounding the site. The aerial photos provide imagery that illustrates local and distant landscape characteristics as well as the locality of key view locations and the extent/nature of potential screening elements.

The panoramic and aerial photographs presented in this LVA have been annotated to identify local features within and beyond the Eco Precinct. The photograph and aerial image locations are described in the following Table and illustrated in **Figure 6** with photographs illustrated in **Figures 7 to 13**.

Table 5 – Photo locations and description

Photo reference (refer Figure 6)	Location	Description
A1	Above proposed ARC building stack location.	360-degree aerial photo across 3 panorama photographs extending toward distant viewpoints (+15km) surrounding the Eco Precinct.
A2	Above the Collector Road corridor toward the Taylors Creek Road intersection at around 4.3km to the proposed ARC building.	View west to southwest toward the Woodlawn Eco Precinct.
P1	Lumley Road, Tarago at 7.4km to closest point of the proposed ARC building.	View northwest toward hills blocking views toward the Eco Precinct.
P2	Collector Road at Bungendore Road intersection at around 5.2km to the proposed ARC building.	View west to northwest from the Collector Road corridor toward the Eco Precinct.

Table 5 – Photo locations and description

Photo reference (refer Figure 6)	Location	Description
P3	Collector Road alongside the Veolia owned Pylara Farm at around 1.9km to the proposed ARC building.	View west to northwest from the Collector Road corridor toward the Eco Precinct.
P4	Collector Road alongside the Eco Precinct at around 510m to the ARC building.	View south to southwest from the Collector Road corridor toward the Eco Precinct and ARC building location.
P5	Collector Road alongside the Eco Precinct at around 400m to the APCr location.	View south to southeast from the Collector Road corridor toward the Eco Precinct and APCr location.
P6	Taylor's Creek Road toward the Eco Precinct at around 5.9km to the ARC building.	View northeast from the Taylor's Creek Road corridor toward the Eco Precinct and APCr location.
P7	Taylor's Creek Road toward the Eco Precinct at around 7.8km to the ARC building.	View northeast from the Taylor's Creek Road corridor toward the Eco Precinct location.
P8	Taylor's Creek Road toward the Eco Precinct at around 9km to the ARC building.	View northeast from the Taylor's Creek Road corridor toward the Eco Precinct location.
P9	Kevin Wheatley VC rest area between the Federal Highway and Lake George at around 18.6km to the ARC building.	Distant views southeast to east toward the Eco Precinct location.
P10	Weereewa Lookout between the Federal Highway and above Lake George at around 19km to the ARC building.	Distant views northeast toward the Eco Precinct location.

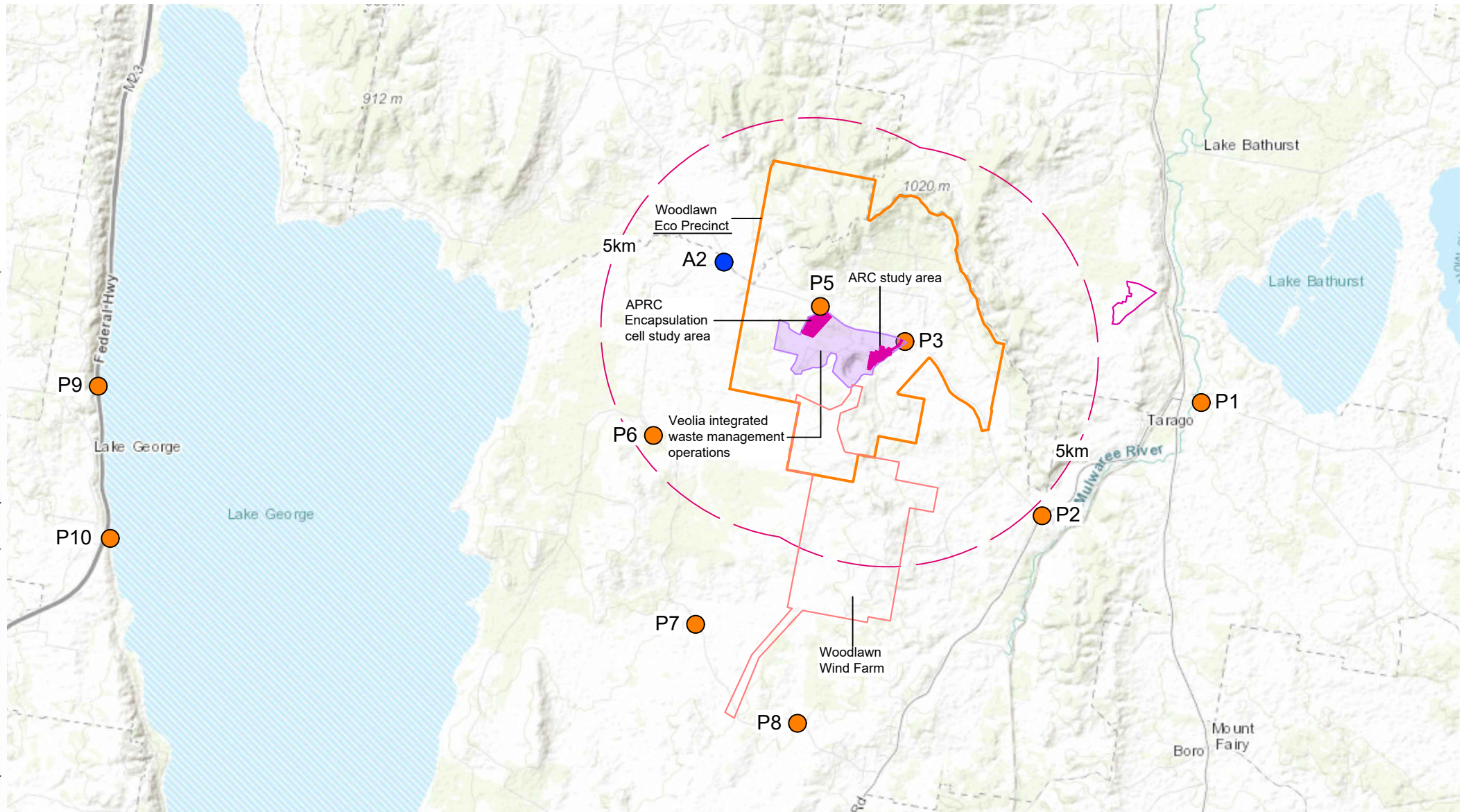


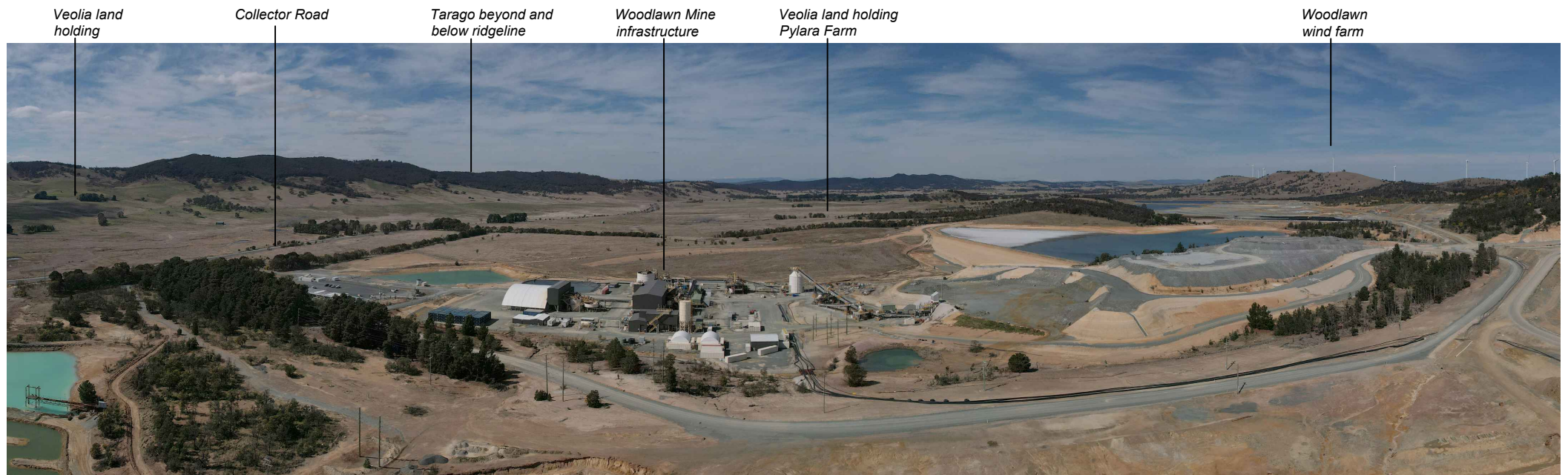
Photo locations

P1 Lumley Road, Tarago
P2 Tarago Collector Road
P3 Collector Road
P4 Collector Road
P5 Collector Road

P6 Taylors Creek Road
P7 Taylors Creek Road
P8 Taylors Creek Road
P9 Kevin Wheatley VC Rest Area (Federal Highway)
P10 Weereewa Lookout (Federal Highway)

A1 Aerial photo from ARC building
approximate stack location and
height at RL862m
A2 Aerial photo from Collector and
Taylors Creek Roads intersection

Figure 6
Photo locations



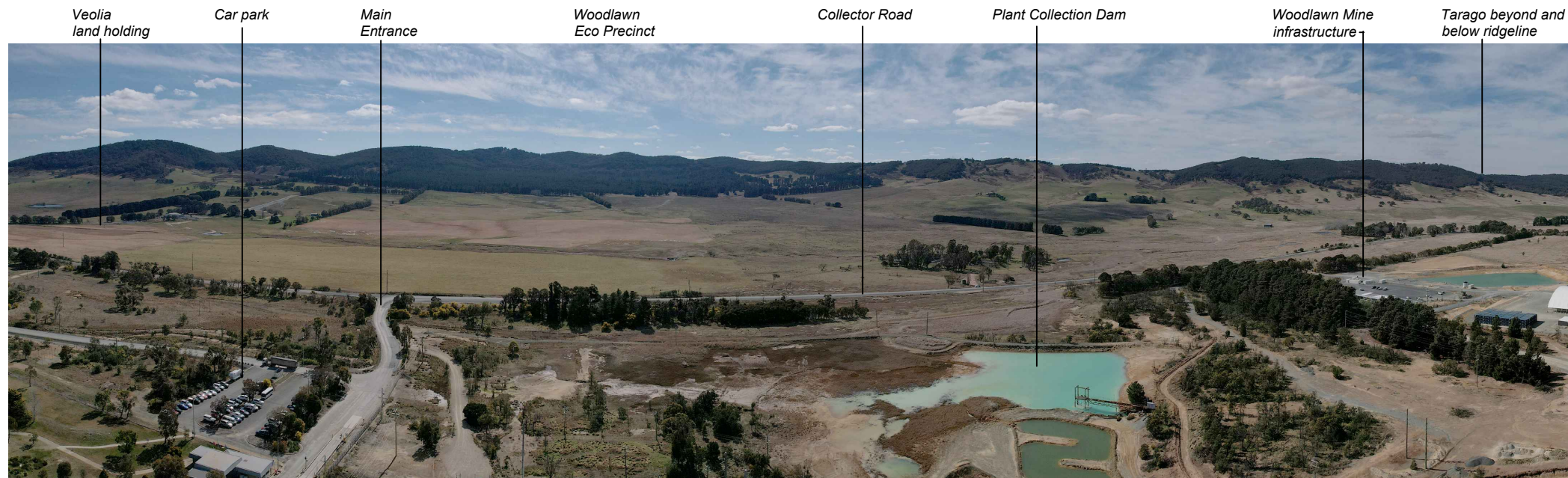
A1 Aerial photo view north east to south from proposed ARC building above approximate stack location



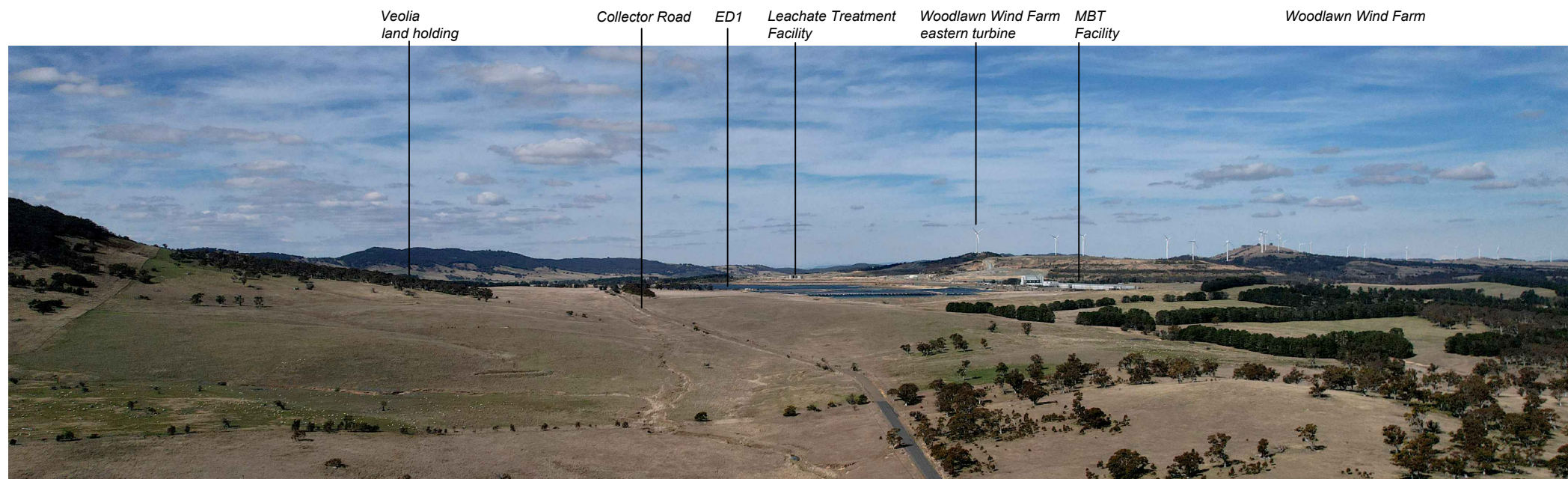
A1 Aerial photo view south to west from proposed ARC building above approximate stack location

Figure 7
Aerial photo sheet 1

Woodlawn Advanced Energy Recovery Centre LVIA



A1 Aerial photo view north to north east from proposed ARC building above approximate stack location



A2 Aerial photo view east to south west above Collector Road toward the Woodlawn Eco Precinct

Figure 8
Aerial photo sheet 2

Woodlawn Advanced Energy Recovery Centre LVIA

Views toward the existing Woodlawn Eco Precinct and proposed ARC/APCr are screened by hills and ridgelines to the north west of Tarago

Braidwood Road



P1 Lumley Road, Tarago. View north west with views toward the Woodlawn Eco Precinct site blocked by landform.

Woodlawn
wind farm

Veolia land holding

Collector Road



P2 Collector Road at junction to Bungendore Road. View north west toward the Woodlawn Eco Precinct site screened by landform and tree cover.

Figure 9
Photo sheet 1

Woodlawn Advanced Energy Recovery Centre LVIA

Woodlawn wind farm
eastern turbine

Woodlawn
Eco Precinct

Woodlawn Mine
infrastructure

Veolia land holding
Pylara Farm

Veolia
land holding

Collector Road



P3 Collector Road. View north west toward the Woodlawn Eco Precinct partially screened by landform and scattered tree cover.

Woodlawn wind farm
eastern turbine

Proposed ARC building
(indicative location)

Existing
substation



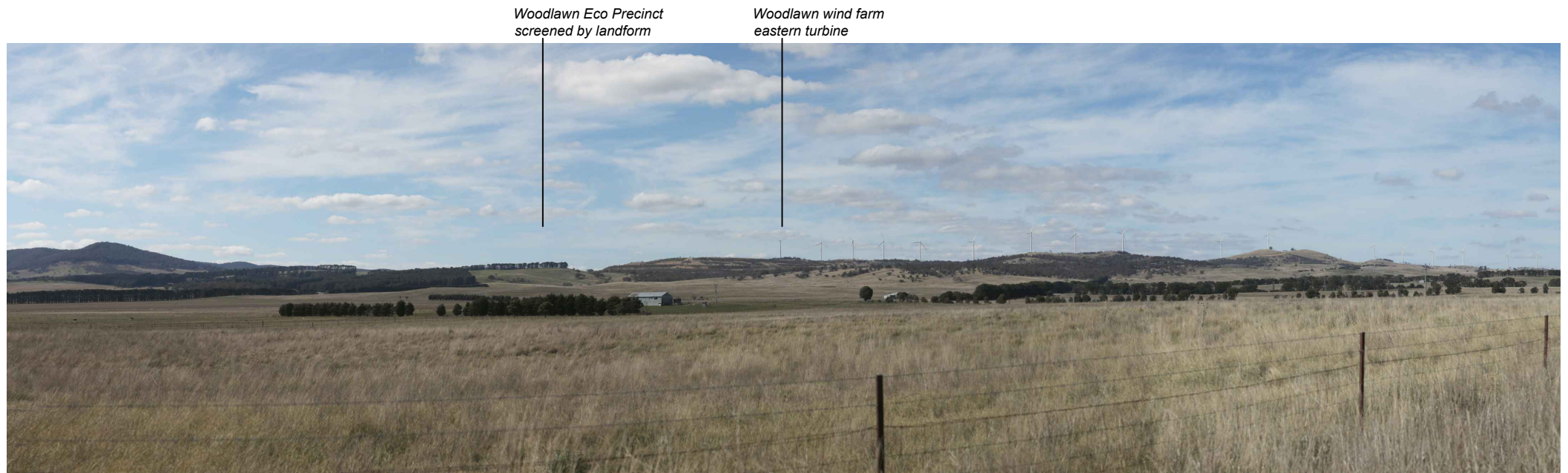
P4 Collector Road. View south west toward the Woodlawn Eco Precinct and proposed ARC building location.

Figure 10
Photo sheet 2

Woodlawn Advanced Energy Recovery Centre LVIA



P5 Collector Road. View south west to south east toward the Woodlawn Eco Precinct.



P6 Taylors Creek Road. View north east to east toward the Woodlawn Eco Precinct screened by landform.

Figure 11
Photo sheet 3

Woodlawn Advanced Energy Recovery Centre LVIA

Woodlawn wind farm
eastern turbine

Views from dwelling toward the Woodlawn Eco Precinct
blocked by landform along wind farm ridgeline



P7 Taylors Creek Road. View north east toward the Woodlawn Eco Precinct and proposed Project location blocked by landform

Top of MBT Facility visible above
sloping ridgeline west of mine site

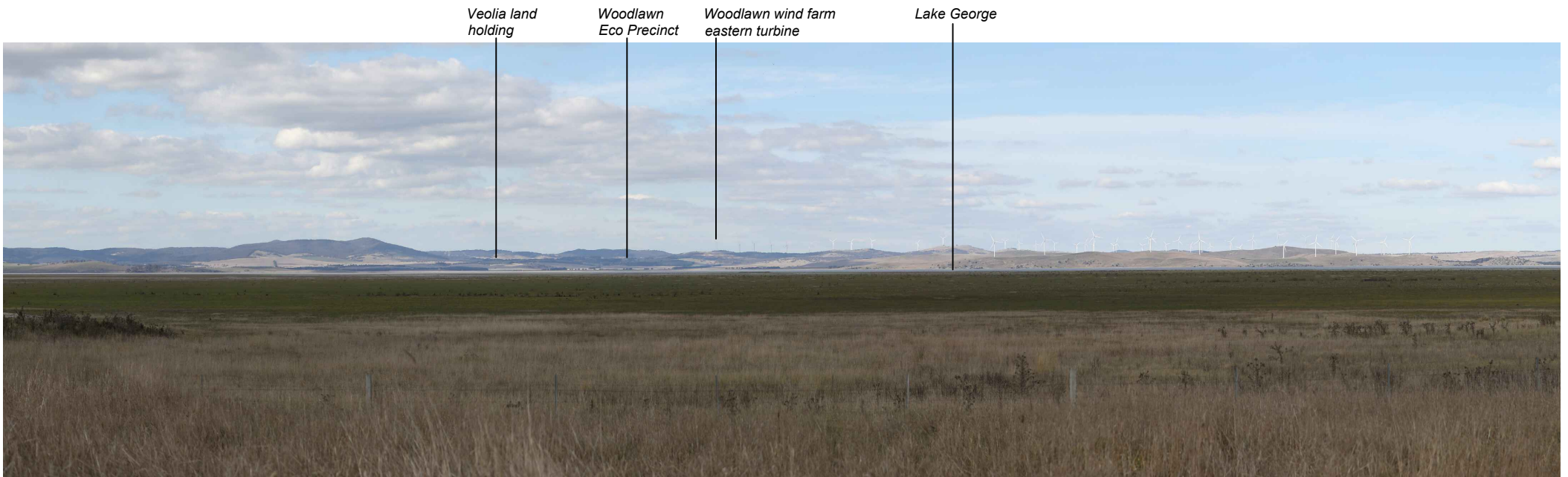
Views toward the Woodlawn Eco Precinct largely
blocked by landform along wind farm ridgeline



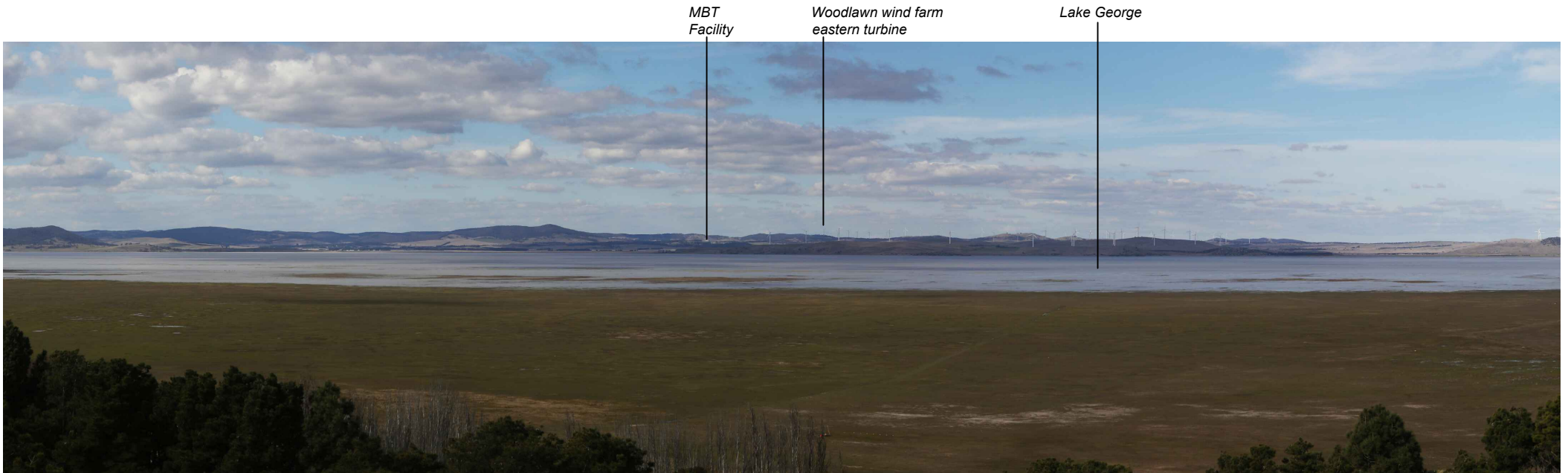
P8 Taylors Creek Road. View north toward the Woodlawn Eco Precinct and proposed Project location largely blocked by landform

Figure 12
Photo sheet 4

Woodlawn Advanced Energy Recovery Centre LVIA



P9 Kevin Wheatley VC Rest Area, Federal Highway. View east toward the Woodlawn Eco Precinct partially screened by landform at around 18.5km from ARC building



P10 Weereewa Lookout, Federal Highway. View north east to east toward the Woodlawn Eco Precinct partially screened by landform at around 19km from ARC building

Figure 13
Photo sheet 5

Woodlawn Advanced Energy Recovery Centre LVIA

Section 6 Landscape character assessment

6.1 Landscape character areas

As part of the LVIA process it is important to understand the nature and sensitivity of different components of landscape character, and to assess them in a clear and consistent process. For the purpose of this LVIA, landscape character is defined as *‘the distinct and recognisable pattern of elements that occur consistently in a particular type of landscape’* (The Countryside Agency and Scottish Natural Heritage 2002). The pattern of elements includes characteristics such as landform, vegetation, land use and settlement.

The landscape character surrounding the Eco Precinct has been determined as a singular landscape unit which generally occurs within 10km of the Eco Precinct. The landscape unit represents an area that is relatively consistent and recognisable in terms of its key landscape elements and physical attributes which include a relatively limited combination of topography/landform, vegetation/landcover, land use and built structures.

Whilst the landscape character surrounding the Eco Precinct has been defined as a singular landscape unit, this LVIA recognises that localised and specific characteristics can occur within the landscape unit, including:

- Landscape associated with the Great Dividing Range (timbered slopes and ridgelines)
- Grassland and pasture
- Lake George
- Collector Road corridor and
- Industrial landscapes (Eco Precinct, including waste management operations, mining operations and the Woodlawn and Capital wind farm infrastructure).

6.2 Landscape character assessment

An understanding of a particular landscape’s key characteristics and principal visual features is important in defining a regional distinctiveness and sense of place and to determine its sensitivity to change. The criteria applied in the determination of landscape character assessment and the ability of a landscape to accommodate change are outlined in **Table 6**. The criteria are broadly outlined in the Guidelines for Landscape and Visual Impact Assessment, Third Edition, Landscape Institute and Institute of Environmental Management & Assessment, 2013 – Chapter 5 Assessment of landscape effects.

Landscape sensitivity is a relative concept, and landscape values of the surrounding environment may be considered of a higher or lower sensitivity than other areas in the region.

Whilst landscape character assessment is largely based on a systematic description and analysis of landscape characteristics, this LVIA acknowledges that some individuals and other members of the local community may place higher values on the local landscape. These values may transcend preferences (likes and dislikes) and include personal, cultural as well as other parameters that may be explored in more depth through consultation with the local community.

Table 6 – Criteria for the assessment of landscape character

Landscape Character Assessment Criteria			
Characteristic	Aspects indicating lower sensitivity to the development	↔	Aspects indicating higher sensitivity to the development
Landform and scale: patterns, complexity and consistency	<ul style="list-style-type: none"> • Large scale landform • Simple • Featureless • Absence of strong topographical variety 	↔	<ul style="list-style-type: none"> • Small scale landform • Distinctive and complex • Human scale indicators • Presence of strong topographical variety
Landcover: patterns, complexity and consistency	<ul style="list-style-type: none"> • Simple • Predictable • Smooth, regular and uniform 	↔	<ul style="list-style-type: none"> • Complex • Unpredictable • Rugged and irregular
Settlement and human influence	<ul style="list-style-type: none"> • Concentrated settlement pattern • Presence of contemporary structures (e.g. utility, infrastructure or industrial elements) 	↔	<ul style="list-style-type: none"> • Dispersed settlement pattern • Absence of modern development, presence of small scale, historic or vernacular settlement
Movement	<ul style="list-style-type: none"> • Prominent movement, busy 	↔	<ul style="list-style-type: none"> • No evident movement, still
Rarity	<ul style="list-style-type: none"> • Common or widely distributed example of landscape character area within a regional context 	↔	<ul style="list-style-type: none"> • Unique or limited example of landscape character area within a regional context
Intervisibility with adjacent landscapes	<ul style="list-style-type: none"> • Limited views into or out of landscape • Neighbouring landscapes of low sensitivity • Weak connections, self contained area and views • Simple large scale backdrops 	↔	<ul style="list-style-type: none"> • Prospects into and out from high ground or open landscape • Neighbouring landscapes of high sensitivity • Contributes to wider landscape • Complex or distinctive backdrops

The landscape sensitivity assessment criteria set out in **Table 6** have been evaluated for the landscape character area by applying a professionally determined judgement on a sliding scale between 1 and 5.

A scale of 1 indicates a landscape characteristic with a lower sensitivity to the project (and would be more likely to accommodate the project). A scale of 5 indicates a landscape characteristic with a high level of sensitivity (and less likely to accommodate the project).

The scale of sensitivity for the landscape character area is outlined in **Table 7** and is set out against each characteristic identified in **Table 6**.

The overall landscape sensitivity for the landscape character area is a summation of the scale for each characteristic identified in **Table 7**.

The overall scale is expressed as a total out of 30 (i.e., 6 characteristics for the landscape character area with a potential top scale of 5). Each characteristic is assessed separately, and the criteria set out in **Table 6** are not ranked in equal significance. The overall landscape sensitivity for the landscape character area has been determined as either:

High (Scale of 23 to 30) – key characteristics of the landscape character area would be impacted by the ARC and would result in major and visually dominant alterations to perceived characteristics of the landscape character area which may not be fully mitigated by existing landscape elements and features. The degree to which the landscape may accommodate the ARC would result in several perceived uncharacteristic and significant changes.

Medium (Scale 15 to 22) – distinguishable characteristics of the landscape character area may be altered by the ARC, although the landscape character area may have the capability to absorb some change. The degree to which the landscape character area may accommodate the ARC would potentially result in the introduction of prominent elements to the landscape character area but may be accommodated to some degree.

Low Rating (Scale of 7 to 14) – most of the landscape character area characteristics are generally robust and would be less affected by the ARC. The degree to which the landscape may accommodate the ARC would not significantly alter existing landscape character.

Negligible Rating (Up to 6) the characteristics of the landscape character area would not be impacted or visibly altered by the ARC.

Table 7 – Landscape character area

	Lower Sensitivity		↔	Higher Sensitivity	
	Low	Low to Med	Medium	Med to High	High
Rating	1	2	3	4	5
Landform and Scale			3		
The Eco Precinct, and development footprint for the ARC and encapsulation cell, extend across generally level to gently sloping land south of the Collector Road corridor. The land slopes from east to west rising around 10m over a distance of around 2km. Landform to the south of the ARC is primarily associated with the Woodlawn Bioreactor site with elevated land surrounding the main void of the former mining operations. The overall Eco Precinct landscape structure is simple with stronger topographical elements including elevated hills and ridgelines along the Great Dividing Range visible to the north and north east beyond the site. The overall scale of the landscape is					

Table 7 – Landscape character area

	Lower Sensitivity		↔	Higher Sensitivity	
	Low	Low to Med	Medium	Med to High	High
Rating	1	2	3	4	5
	moderate to large with low hills and ridgelines constraining opportunities for long range views through the landscape and beyond the ARC building and encapsulation cell.				
Landcover		2			
	Landcover surrounding the Eco Precinct vicinity is largely simple and regular in appearance comprising large areas of agricultural land with pasture and scattered tree cover which becomes denser woodland across steeper hills and ridgelines. Wind turbines extend south from the Woodlawn Bioreactor and south east toward the eastern fringe of Lake George, a semi-permanent water body bordered by the Federal Highway to the west and south west of the project site. Landcover is generally uniform and predictable without any significant level of complexity.				
Settlement and human influence		2			
	Settlement is generally dispersed throughout the surrounding landscape and consists largely of farms and associated dwellings. Human influence within the landscape is evident throughout portions of the Eco Precinct through mining activities and ground disturbance. Constructed elements are visible within the Eco Precinct but are generally visually dispersed and simple in form.				
Movement		2			
	Movement beyond the Eco Precinct generally involves local traffic movements, including cars and trucks travelling along Collector Road and Taylors Creek Road as well as other minor local roads/access tracks. Occasional agricultural vehicles are seen within fields, with movement and activity expected to be greater during intense farming periods. Movement within the Eco Precinct is more noticeable with regular daily vehicular trips for staff to and from the site and onsite operations.				
Rarity		2			
	The landscape characteristics found within and surrounding the Eco Precinct are considered to be relatively common landscape types within a regional context.				
Intervisibility		2			
	The Eco Precinct is considered to be significantly visually constrained by surrounding topography which limits opportunities for major views into or out of the landscape within the Eco Precinct. The Eco Precinct visual environment				

Table 7 – Landscape character area

	Lower Sensitivity		↔	Higher Sensitivity	
	Low	Low to Med	Medium	Med to High	High
Rating	1	2	3	4	5
	is largely self-contained with simple backdrops formed by hills and ridgelines from distant view locations.				
Overall Sensitivity Rating	<p>Score 13 out of 30</p> <p>In consideration of the existing landscape characteristics, the landscape within and surrounding the Eco Precinct has been determined to have a low sensitivity to the ARC and the encapsulation cell. Most of the landscape character area characteristics are generally robust and would be less affected by the project. The degree to which the landscape may accommodate the project would not significantly alter existing landscape character.</p>				

6.3 Visual Absorption Capability

Visual Absorption Capability (VAC) is a classification system used to describe the relative ability of the landscape to accept modifications and alterations without the loss of character or deterioration of visual amenity. VAC relates to the physical characteristics of landscape that are often inherent and quite static in the long term. In essence the VAC indicates the ability of a landscape setting to accommodate new development.

The VAC of a landscape is largely determined by inherent physical factors which include:

- the degree of visual penetration (view distance without obstruction) through surrounding landforms and tree cover
- the complexity of the landscape through scale, form and line.

Landscapes with a low visual penetration tend to have higher VAC values and a greater ability to accommodate new development. Complex landscapes which include a mix of scale, form and line (together with some degree of vegetative screening) also have higher VAC values. The VAC of the landscape surrounding the Eco Precinct and project exhibits a relatively high VAC through a combination of undulating and ridgeline landforms which disrupt long and medium distance views across the landscape, together with areas of scattered and denser stands of vegetation.

Section 7 Viewshed

7.1 Viewshed

For the purpose of this LVIA the viewshed is defined as the area of land surrounding the project which could be affected by project related infrastructure, including the proposed ARC building, the IBA area and the encapsulation cell.

The immediate viewshed (generally within 2km of the ARC) would be limited to views from the Collector Road corridor. Views would extend toward the ARC building and the encapsulation cell from short sections of the road corridor; however, views would be short term and generally indirect to the direction of travel. Views toward the ARC building would also be disrupted by tree cover alongside the road corridor and bounding the mining operations to the east of the ARC building. The immediate viewshed would also be disrupted by gently undulating landforms below distinct ridgelines creating dips and crests along the Collector Road corridor (Refer **Figures 14 and 15**).

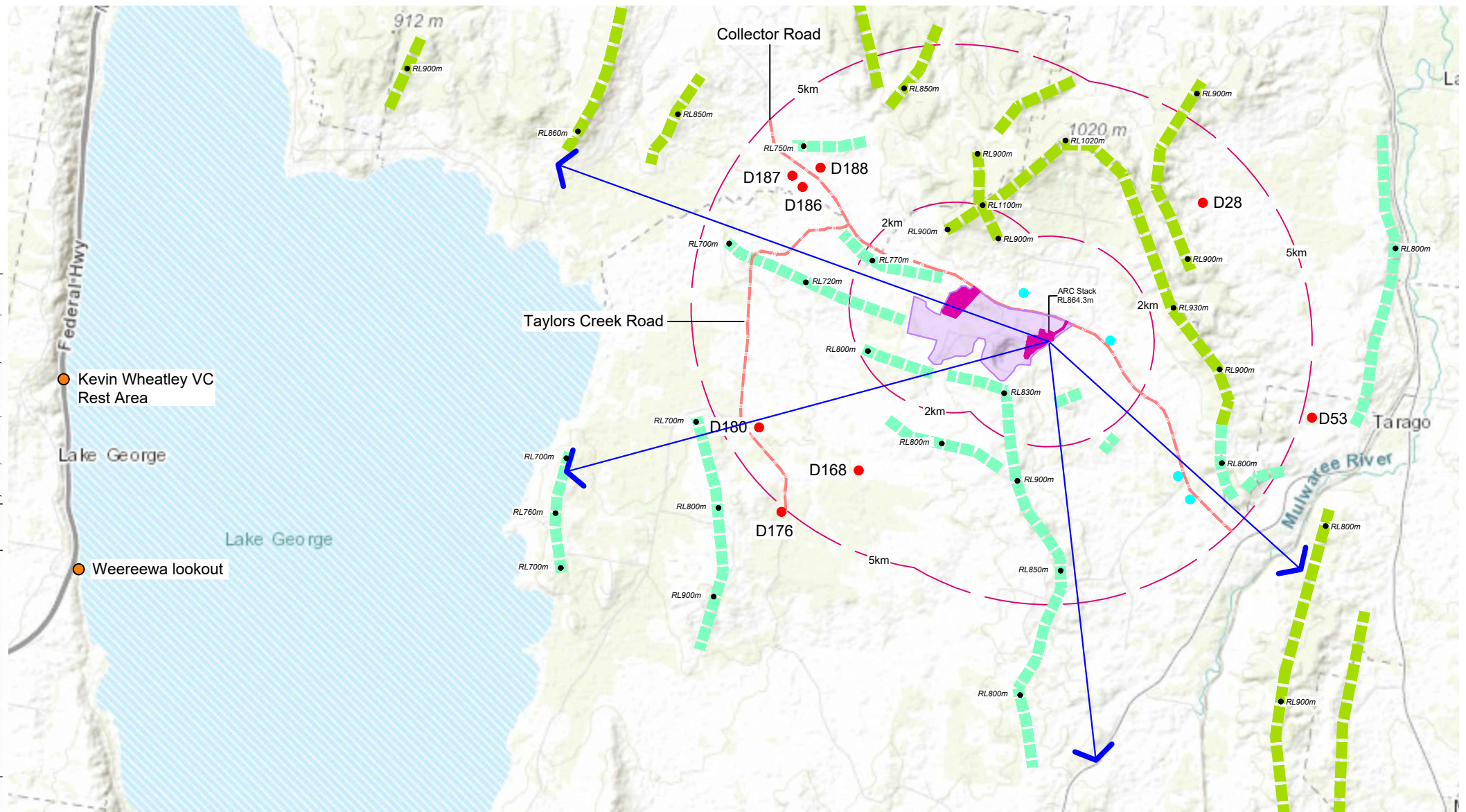
The broader viewshed would be limited by rising landform and ridgelines to the north, northwest, east and southeast of the Eco Precinct, with the Great Dividing Range extending through elevations at around 900m AHD to 1,000m AHD as illustrated in the Viewshed Analysis **Figure 14**.

More distant views would also be influenced by lower undulating landforms (between 700m AHD to 800m AHD), including landforms along the Woodlawn Wind Farm, and across the Capital Wind Farm east of Lake George and south of the Eco Precinct.

Distant views (including those more than 15km) toward project infrastructure from lookout points (rest areas) along the Federal Highway would tend to be screened by landform, as would views from vehicles travelling along the Federal Highway. Views from elevated viewpoints along the Federal Highway, including the Weereewa Lookout may extend toward portions of the ARC building and the encapsulation cell; however, at around 19km view distance any visible elements would be indistinct and unlikely to be viewed as dominant features within the available viewshed.

Receiver locations with a view toward the ARC within the immediate viewshed would be largely confined to motorists experiencing short duration views toward the ARC from Collector Road.

The Viewshed Analysis and Viewshed Map are illustrated in **Figures 14 and 15**.

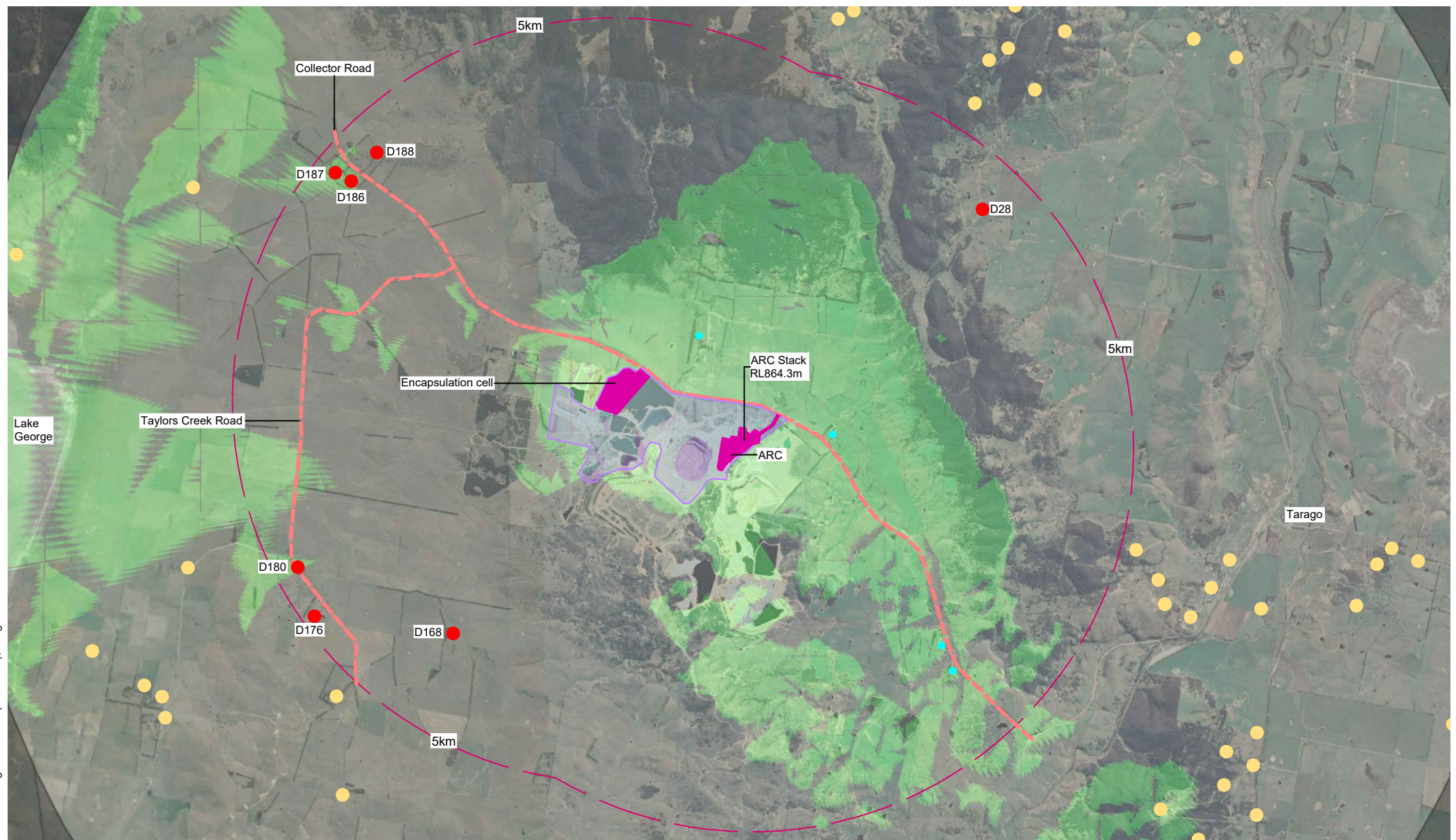


Key

- | | | | | | |
|---|--------------------|-------------------------------------|----------------------------------|--|--|
| ● D28 | Dwelling location | ● | Veolia owned dwelling | | Elevated steep ridgeline (timbered) with screening potential |
| | Project study area | | Distance from study area | | Low soft ridgeline (pasture/scattered timber) with local screening potential |
| | Veolia operations | | Local road | | Indicative view corridor |
| P10 ● | Lookout | | Indicative ridgeline spot height | | |

Figure 14
Viewshed analysis

Woodlawn Advanced Energy Recovery Centre LVIA



Key

- D28 Dwelling location
- Project study area
- Veolia operations

- Veolia owned dwelling
- 5km Distance from study area
- Dwelling location beyond 5km from study area
- Local road

■ Indicative visibility toward ARC Building top of stack (around 864.3m AHD)

Note:
Indicative visibility is modelled against landform and does not account for the potential screening effect of vegetation or built structures which may also screen or filter views toward the ARC.

Figure 15
Viewshed map

Woodlawn Advanced Energy Recovery Centre LVIA

Section 8 Visual impact assessment

8.1 Introduction

In accordance with Practice note – N04 the significance of visual impact that would result from the construction and operation of a project is a composite of the *sensitivity* of the view and *magnitude* of the project in that view.

8.2 Quantifying impacts

Practice note – N04 states that:

‘Sensitivity refers to the qualities of an area, the number and type of receivers and how sensitive the existing character of the setting is to the proposed change. For example a pristine natural environment would be more sensitive to change than a built up industrial area’.

‘Magnitude refers to the nature of the project. For example a large interchange would have a very different impact on landscape character than a localised road widening in the same area’.

The combination of sensitivity and magnitude provide the rating of visual impact for a viewpoint. **Table 8** sets out the Practice note – N04 relative visual impact grading values which combine sensitivity and magnitude.

Table 8 Visual impact grading matrix

		Magnitude			
		High	Moderate	Low	Negligible
Sensitivity	High	High impact	High-Moderate	Moderate	Negligible
	Moderate	High-Moderate	Moderate	Moderate-Low	Negligible
	Low	Moderate	Moderate-Low	Low	Negligible
	Negligible	Negligible	Negligible	Negligible	Negligible

Practice note – N04 determines that *‘a judgement must be made as to the quality and extent of the design solution in assessing magnitude and impact. Determining a low impact based on the assumption that the very highest quality design outcome would be achieved could be unrealistic and misleading. However it is equally misleading to determine impacts based on the very worst outcomes. A balance must be found but it is usually better to err on the side of caution’*. To be in accordance with Practice note – N04, this LVIA has erred on the side of caution given that the assessment is based on a concept design that would be further refined during the following stages of the design process.

8.3 Key existing viewpoints

This LVIA has considered and assessed residential and public viewpoints to around 5km from the project study area. The desktop review determined that views toward the Eco Precinct from viewpoints more than 5km away would be unlikely to experience a significant visual impact, and that existing and proposed structures within the Eco Precinct would be largely screened by landform and/or tree cover. The viewpoints included in this LVIA comprise residential dwellings, road corridors and public lookouts from rest areas west of Lake George. The viewpoints are illustrated in **Figure 16**.

8.4 Visual sensitivity

Following selection, the viewpoints have been rated as to their sensitivity to change by the project. The Practice note – N04 states that *‘visual sensitivity refers to the quality of the existing view and how sensitive the view is to the proposed change. Visual sensitivity is related to the direction of view and the composition of the view’*.

Table 9 identifies:

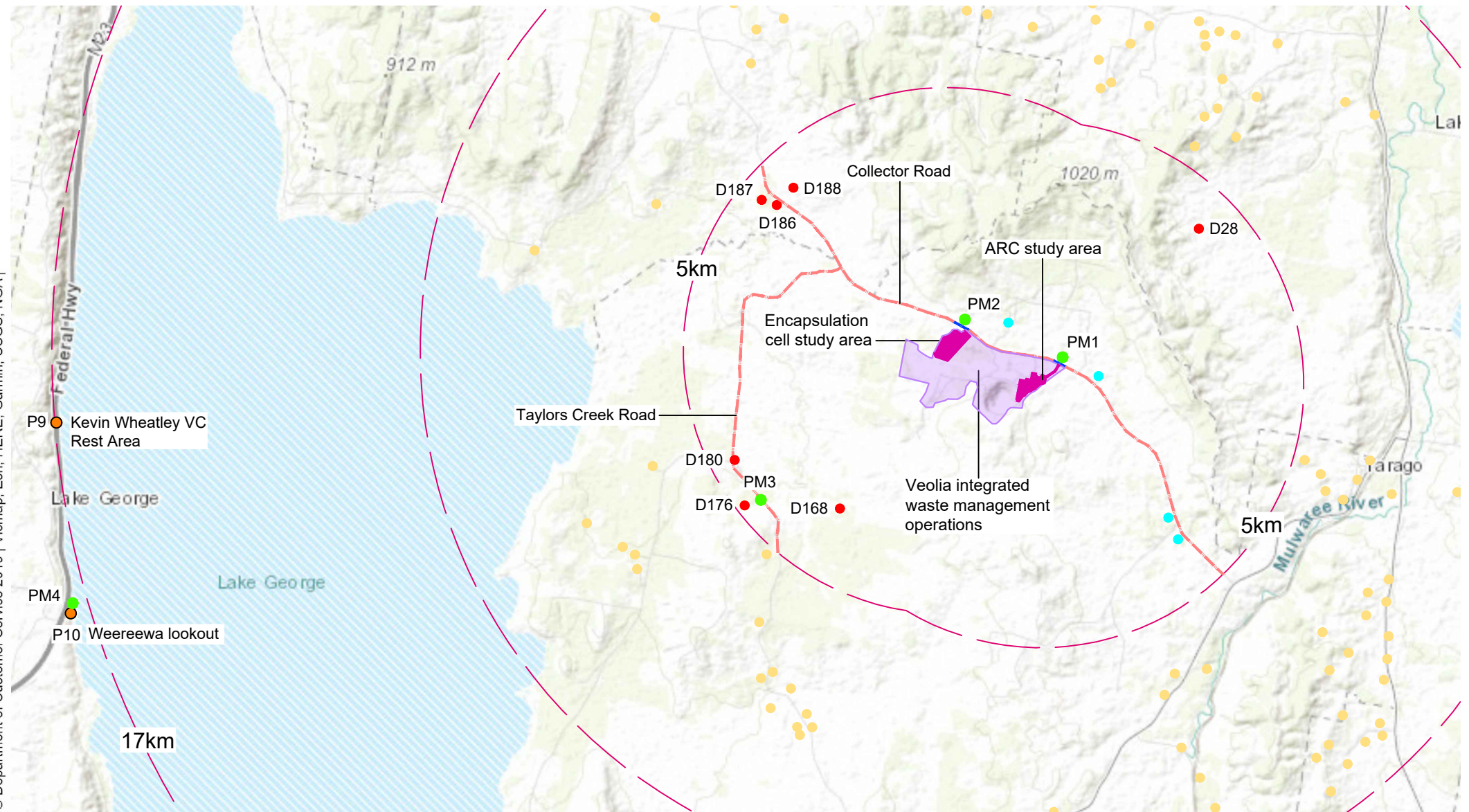
- viewpoints and receiver types for the project
- the view direction and approximate distance to the project for each receiver viewpoint
- description of the existing view from each viewpoint and
- an assessment of the visual sensitivity and visual magnitude (erring on the side of caution) for each viewpoint.

8.5 Visual magnitude

In accordance with Practice note – N04, magnitude is *‘the measurement of scale, form and character of a development proposal when compared with the existing condition. In the case of visual assessment this also relates to how far the proposal is from the viewer’*.

Table 10 identifies:

- viewpoints
- the approximate distance from the viewpoint to the project
- a judgement on comparable scale, form and character between existing and proposed conditions and
- an assessment of the visual magnitude (erring on the side of caution) for each viewpoint.



Key

- | | | | | | |
|--|---|---|--------------------------|--|--|
| ● D28 | Dwelling within 5km of the project site | ● | Veolia owned dwelling | — | Approximate extent of view toward ARC and encapsulation cell from Collector Road |
| ● | Dwelling beyond 5km of project site | --- | Distance from study area | ● PM2 | Photomontage location |
| | Project study area | ● P10 | Public lookout | | |
| | Veolia operations | --- | Local road | | |

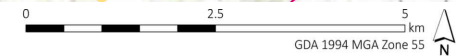


Figure 16
View locations

Woodlawn Advanced Energy Recovery Centre L VIA

Table 9 – Visual sensitivity and magnitude matrix

Receiver viewpoint (Refer Figure 16)	View direction and distance	View description	Visual sensitivity grading	Comparable judgement between the existing and proposed condition	Visual magnitude grading
D28 Rural dwelling/building Refer Figure 9 photo P1 for general context	The ARC is located 4.24km south-west of the dwelling/building location. The encapsulation cell is located 5.34km south-west of the dwelling/building.	Views toward the ARC and encapsulation cell from the receiver viewpoint are screened by landform and existing timber on slopes and ridgelines west of the dwelling/building.	High	The ARC would not form a visible element from this receiver viewpoint. Views toward the project are blocked by landform south-west of the receiver viewpoint. The encapsulation cell would not be visible from this receiver viewpoint. There would be no change to the existing view.	Negligible
D168 Rural dwelling	The ARC is located 4.46km north-east of the dwelling location. The encapsulation cell is located 3.57km north-east of the dwelling.	Views toward the ARC and encapsulation cell from the receiver viewpoint are screened by a low undulating landform and scattered tree cover on slopes and ridgelines.	High	The ARC would not form a visible element from this receiver viewpoint. Views are blocked by landform as well as tree planting surrounding the dwelling. The encapsulation cell would not be visible from this receiver viewpoint. There would be no change to the	Negligible

Table 9 – Visual sensitivity and magnitude matrix

Receiver viewpoint (Refer Figure 16)	View direction and distance	View description	Visual sensitivity grading	Comparable judgement between the existing and proposed condition	Visual magnitude grading
				existing view.	
D176 Rural dwelling	The ARC is located 5.92km north-east of the dwelling location. The encapsulation cell is located 4.67km north-east of the dwelling.	Views toward the ARC and encapsulation cell from the receiver viewpoint are screened by a low undulating landform and scattered tree cover on slopes and ridgelines.	High	The ARC would not form a visible element from this receiver viewpoint. Views are blocked by landform as well as tree planting surrounding the dwelling. The encapsulation cell would not be visible from this receiver viewpoint. There would be no change to the existing view.	Negligible
D180 Rural dwelling	The ARC is located 5.96km north-east of the dwelling location. The encapsulation cell is located 4.55km north-east of the dwelling.	Views toward the ARC and encapsulation cell from the receiver viewpoint are screened by a low undulating landform and scattered tree cover on slopes and ridgelines south-west of the Woodlawn Mine.	High	The ARC would not form a visible element from this receiver viewpoint. Views are blocked by landform as well as tree planting surrounding the dwelling. The encapsulation cell would not be visible from this receiver viewpoint. There would be no change to the existing view.	Negligible
D186	The ARC is located 5.98km south-east of the dwelling	Views toward the ARC and encapsulation cell from the receiver	High	The ARC would not form a visible element from this receiver viewpoint.	Negligible

Table 9 – Visual sensitivity and magnitude matrix

Receiver viewpoint (Refer Figure 16)	View direction and distance	View description	Visual sensitivity grading	Comparable judgement between the existing and proposed condition	Visual magnitude grading
Rural dwellings	location. The encapsulation cell is located 4.32km south-east of the dwellings.	viewpoint are screened by a low undulating landform and tree screen planting east of the dwellings.		Views are blocked by landform as well as tree planting surrounding the dwelling. The encapsulation cell would not be visible from this receiver viewpoint. There would be no change to the existing view.	
D187 Rural dwelling	The ARC is located 6.27km south-east of the dwelling location. The encapsulation cell is located 4.6km south -east of the dwelling.	Views toward the ARC and encapsulation cell from the receiver viewpoint are screened by a low undulating landform and tree screen planting east of the dwellings.	High	The ARC would not form a visible element from this receiver viewpoint. Views are blocked by landform as well as tree planting surrounding the dwelling. The encapsulation cell would not be visible from this receiver viewpoint. There would be no change to the existing view.	Negligible
D188 Rural dwelling	The ARC is located 5.97km south-east of the dwelling location.	Views toward the ARC and encapsulation cell from the receiver viewpoint are screened by a	High	The ARC would not form a visible element from this receiver viewpoint. Views are blocked by landform as well	Negligible

Table 9 – Visual sensitivity and magnitude matrix

Receiver viewpoint (Refer Figure 16)	View direction and distance	View description	Visual sensitivity grading	Comparable judgement between the existing and proposed condition	Visual magnitude grading
	The encapsulation cell is located 4.39km south-east of the dwelling.	combination of landform and tree screen planting beyond a shearing shed east of the dwelling.		as tree planting east of the dwelling. The encapsulation cell would not be visible from this receiver viewpoint. There would be no change to the existing view.	
Collector Road (north of ARC and encapsulation cell and leachate evaporation pond) Refer Figure 10 photo P3 and P4 and Figure 11 photo P5 for general context	The ARC building is located 400m south-west of the road corridor at approximate closest point. The encapsulation cell and leachate evaporation pond are located 300m south of the road corridor.	Views extend into the Eco Precinct with some filtering of views provided by scattered tree cover which screens views of existing constructed elements. Wind turbines are prominent to the skyline.	Moderate	The ARC would be visible from a short section of the road corridor (around 220m) with existing roadside screen planting disrupting views toward existing infrastructure within the Eco Precinct site. Views toward the encapsulation cell and leachate evaporation pond would be largely screened along Collector Road by an earth embankment running parallel to the road corridor north of ED1. The encapsulation cell would be visible from a short 250m section of	Low

Table 9 – Visual sensitivity and magnitude matrix

Receiver viewpoint (Refer Figure 16)	View direction and distance	View description	Visual sensitivity grading	Comparable judgement between the existing and proposed condition	Visual magnitude grading
				road corridor north-west of ED1.	
Taylors Creek Road Refer Figure 11 photo P6 for general context	The ARC is located 5.7km east of the road corridor at approximate closest point. The encapsulation cell is located 4km east of the road corridor.	Views toward the ARC and encapsulation cell from the Taylors Creek Road corridor are screened by a combination of low undulating landform within and beyond the Eco Precinct site.	Low	The ARC would not form a visible element from this receiver viewpoint. Views are blocked by landform as well as tree planting east of the dwelling. The encapsulation cell and leachate evaporation pond would not form significant visible elements from this receiver viewpoint. There would be minimal change to the existing view.	Negligible
Key receiver viewpoints more than 5km from study area (Refer Figure 16)					
Kevin Wheatley VC rest area	The ARC is located 17km east of the rest area at approximate closest point. The encapsulation cell is	Broad views from the rest area extend east across Lake George toward undulating hills and ridgelines accommodating the Capital and Woodlawn Wind Farm turbines.	High	The ARC would not form a significant visible element from this receiver viewpoint. Views are largely blocked by landform as well as tree planting west of the Eco Precinct.	Negligible

Table 9 – Visual sensitivity and magnitude matrix

Receiver viewpoint (Refer Figure 16)	View direction and distance	View description	Visual sensitivity grading	Comparable judgement between the existing and proposed condition	Visual magnitude grading
	located 18.6km east of the rest area.	Views toward the ARC and encapsulation cell would be largely screened by undulating landform and tree cover to the west of the Eco Precinct.		The encapsulation cell would not be visible from this receiver viewpoint. There would be minimal change to the existing view.	
Weereewa Lookout	The ARC is located 19km east of the rest area at approximate closest point. The encapsulation cell is located 17.5km east of the rest area.	Broad elevated views from the lookout extend east across Lake George toward undulating hills and ridgelines accommodating the Capital and Woodlawn Wind Farm turbines. Views toward the ARC and encapsulation cell would be partially screened by undulating landform and tree cover to the west of the Eco Precinct.	High	The ARC would not form a significant visible element from this receiver viewpoint. Views are largely blocked by landform as well as tree planting west of the Eco Precinct. The upper portion of the encapsulation cell would be partially visible from this receiver viewpoint; however, very long-distance views would not result in the cell forming a dominant landscape feature. There would be minimal to negligible change to the existing view.	Negligible

Table 9 – Visual sensitivity and magnitude matrix

Receiver viewpoint (Refer Figure 16)	View direction and distance	View description	Visual sensitivity grading	Comparable judgement between the existing and proposed condition	Visual magnitude grading
Federal Highway	<p>The ARC is located 18.5km east of the Federal Highway at approximate closest point.</p> <p>The encapsulation cell is located 16km east of the Federal Highway at approximate closest point.</p>	<p>Broad views from the Highway extend east across Lake George toward undulating hills and ridgelines accommodating the Capital and Woodlawn Wind Farm turbines.</p> <p>Views toward the ARC and encapsulation cell would be largely screened by undulating landform and tree cover to the west of the Eco Precinct.</p>	Moderate	<p>The ARC would not be a readily visible element from this receiver viewpoint due to the view distance. Views are largely blocked by landform as well as tree planting west of the Eco Precinct.</p> <p>The encapsulation cell would not be visible from this receiver viewpoint.</p>	Negligible
Tarago locality	<p>The ARC is located 7km west of Tarago at the approximate closest point.</p> <p>The encapsulation cell is located 8.7km west of the Tarago at the approximate closest</p>	<p>Views toward the ARC and encapsulation cell from Tarago are blocked by elevated landform and ridgelines along the Great Dividing Range.</p>	High	<p>The ARC would not be visible from this receiver viewpoint due to landform blocking views.</p> <p>The encapsulation cell would not be visible from this receiver viewpoint.</p> <p>There would be no change to the existing view.</p>	Negligible

Table 9 – Visual sensitivity and magnitude matrix

Receiver viewpoint (Refer Figure 16)	View direction and distance	View description	Visual sensitivity grading	Comparable judgement between the existing and proposed condition	Visual magnitude grading
	point.				

8.6 Assessment of visual impacts

Practice note – N04 stipulates that the impact of the project on each viewpoint be assessed and that the visual impact should be based on a composite of the sensitivity of the view and magnitude of the project in that view. A composite visual impact grading has been determined for each receiver viewpoint by reference to the visual impact grading matrix set out in **Table 8**.

Table 10 identifies:

- receiver viewpoints
- the visual sensitivity grading for each receiver location
- the visual magnitude grading for each receiver location
- an assessment of the visual impact (erring on the side of caution).

Table 10 – Visual impact assessment matrix

Receiver viewpoint (Refer Figure 16)	Visual sensitivity grading	Visual magnitude grading	Visual impact
D28 Rural dwelling	High	Negligible	Negligible
D168 Rural dwelling	High	Negligible	Negligible
D176 Rural dwelling	High	Negligible	Negligible
D180 Rural dwelling	High	Negligible	Negligible
D186 Rural dwelling	High	Negligible	Negligible
D187 Rural dwelling	High	Negligible	Negligible
D188 Rural dwelling	High	Negligible	Negligible
Collector Road (north of ARC and encapsulation cell)	Moderate	Low	Moderate-Low
Taylors Creek Road	Moderate	Negligible	Negligible

Table 10 – Visual impact assessment matrix

Receiver viewpoint (Refer Figure 16)	Visual sensitivity grading	Visual magnitude grading	Visual impact
Kevin Wheatley VC Rest Area	High	Negligible	Negligible
Weereewa Lookout	High	Negligible	Negligible
Federal Highway	Moderate	Negligible	Negligible
Tarago locality	High	Negligible	Negligible

8.7 Summary of visual impact

This LVIA has determined that:

- One of the thirteen receiver viewpoints would likely experience a moderate to low visual impact and
- Twelve of the thirteen receiver viewpoints would likely experience a negligible visual impact.

Collector Road (incorporating views from north of the ARC and the encapsulation cell) has been determined to have an overall moderate-low visual impact with regard to the ARC building and encapsulation cell. These sections of Collector Road represent the closest point along Collector Road to each of these project elements, respectively. Whilst determined as a moderate-low impact, it is noted that:

- views toward both sites would primarily occur from moving vehicles (for less than 10 seconds) and would be indirect to the direction travel
- opportunities to gain views toward the ARC and the encapsulation cell would be further interrupted and/or limited by tree screening along the majority of the Collector Road corridor.

All dwelling receiver viewpoints, as well as the Tarago locality, have been determined to have an overall negligible visual impact with regard to the ARC building and encapsulation cell. The negligible visual impact results from the screening and blocking effect of landform and tree cover between the receiver viewpoints and the Eco Precinct and project.

Dwelling receiver locations beyond 5km of the project study areas would be largely subject to screening through the influence of landform and tree cover. **Figure 14** illustrates most dwelling receiver locations beyond 5km would have limited visibility toward the ARC and encapsulation cell study areas.

The ARC building stack would not be significantly visible from surrounding view locations, including short duration and indirect views from Collector Road. From distant views, including the Weereewa Lookout around

19km from the study areas, views toward the ARC building would include the ARC building roof and stack. At this distance the ARC building and stack would form very small elements within the overall available view with the stack viewed against a backdrop of vegetated hills and ridgelines and not forming a skyline object. The encapsulation cell would also be largely indistinct within long distance views, and once established with grass cover, would not be visually distinguishable from surrounding undulating landform or vegetated slopes forming a backdrop to views from the Lookout. The leachate evaporation pond would not be visible from the Lookout. The view toward the ARC from the Weereewa Lookout is illustrated in photomontage PM4 and the PM4 detail (refer Figures 19 and 20). The stack would be visible as a much smaller structure in comparison to the wind turbines to the south and south west of the study areas.

A plume from the ARC stack may be visible at certain times and may occur under weather conditions where water vapour condenses resulting in a visible white or light grey plume. The weather conditions include cold and clear conditions (occurring mainly at night) as well as days with high relative humidity (i.e., wet and damp weather). A plume would not result in significant visual impacts, with plume height and duration of visibility subject to prevailing weather conditions. Other plumes not related to the ARC may also be visible in the landscape at certain times of year, including those associated with wood burning stoves at dwelling locations.

Receiver viewpoints including the Federal Highway, the Kevin Wheatley VC rest area and the Weereewa Lookout have been determined to have a negligible visual impact. The negligible visual impact results from the view distance of between 16km and 19km toward the ARC building and the encapsulation cell. Elements within these works would not be generally distinguishable from the surrounding landscape, or where visible would not be dominant visual elements in the view.

8.8 Construction activities

Whilst construction activities would tend to be more visible than the operational stage of the ARC building, the construction activities would be temporary and transient in nature. Views toward construction activities would be partially restricted by landform existing tree cover surrounding the Eco Precinct.

The encapsulation cell would be constructed in a staged approach over an anticipated 25 year design life. The staging would include development in four major cells located within the western extent of ED1. Stage 1 of the encapsulation cell would be at the furthest extend from Collector Road, with the encapsulation cell stages being developed in a south to north direction. The encapsulation cell would be located in a visually constrained location where ongoing works would be largely restricted to indirect and very short term views (less than 15 seconds) from around 250m of the road corridor.

8.9 Night time lighting

The project would require installation of lighting for operational, safety, security and maintenance purposes. Night lighting would include building and pole mounted directional spot lighting and pole mounted pedestrian/car park lighting. The ARC building would avoid broad area or floodlighting where possible. Some flood lighting may be required during night time handling of containers; however, this lighting would be screened by the ARC building. There would be no opportunity for light spill to fall on to surrounding sensitive

views locations. Light installations would be installed in accordance with the Australian Standard *Control of the obtrusive effects of outdoor lighting* (AS 4282-2019) and avoid light spill to adjoining road corridors and residential areas. In summary, night time lighting is not anticipated to have an adverse impact.

8.10 Overshadowing

The location of the ARC building in relation to the offset distance to road corridors would result in shadows cast by new infrastructure being largely contained within the Eco Precinct boundary. The ARC building will not create any cumulative shadowing in addition to existing infrastructure within the Eco Precinct boundary.

Section 9 Photomontages

9.1 Photomontages

Photomontages have been prepared to illustrate the general appearance of the ARC building and the encapsulation cell. Four locations were selected to illustrate the proposed works from view locations on the Collector Road corridor, Taylors Creek Road and the Weereewa Lookout and include:

- **Figure 17** Photomontage 1 looking south from Collector Road corridor toward the ARC building and
- **Figure 18** Photomontage 2 looking south from Collector Road corridor toward the encapsulation cell and ARC building.
- **Figure 19** Photomontage 3 looking north east from Taylors Creek Road (illustrating landform screening view)
- **Figure 19** Photomontage 4 looking east to north east from the Weereewa Lookout over Lake George and
- **Figure 20** Photomontage 4 detail view from the Weereewa Lookout.

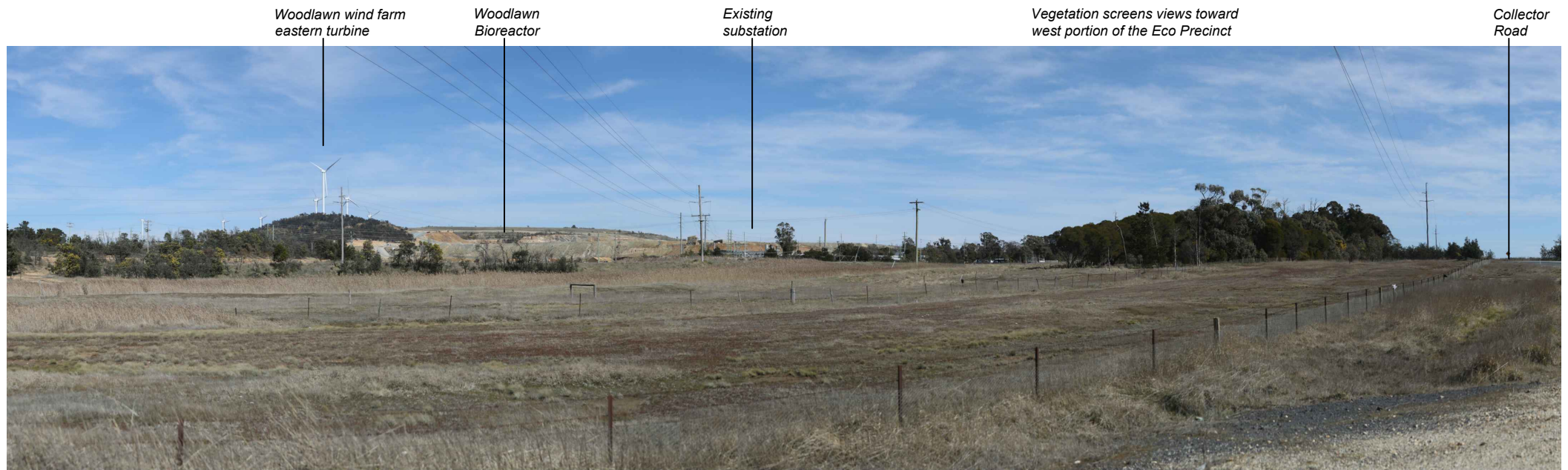
Each photomontage was generated through the following steps:

1. A digital terrain model (DTM) of the project site was created from a terrain model of the surrounding area using digital contours
2. The site DTM was loaded into a modelling software package
3. The layout of the ARC building and APCr encapsulation call was configured
4. The location of each viewpoint (photo location) was configured in the modelling software – the sun position for each viewpoint was configured by using the time and date of the photographs from that viewpoint
5. The view from each photomontage location was then assessed. This process requires accurate mapping of the terrain as modelled, with that as seen in the photographs. The photographs, taken from each photomontage location were loaded into the modelling software and visible superimposed on the photographs
6. The photomontages were adjusted using Photoshop CS3 to compensate for fogging due to haze or distance, as well as screening by vegetation or obstacles and
7. The final image was converted to JPG format and imported and annotated as the final figure.

The horizontal and vertical field of view within the majority of the photomontages exceeds the parameters of normal human vision. However, in reality the eyes, head and body can all move and under normal conditions a person would sample a broad area of landscape within a panoramic view. Rather than restricting the extent of each photomontage to a single photographic image, a broader field of view is presented to more fully illustrate the extent of the project.

Whilst a photomontage can provide an image that illustrates an accurate representation of constructed elements in relation to their proposed location and scale relative to the surrounding landscape, this LVIA acknowledges that large scale objects in the landscape can appear smaller in photomontage than in real life and is partly due to the fact that a flat image does not allow the viewer to perceive any information relating to depth or distance.

The photomontage locations are illustrated in **Figure 16** and the photomontages are presented in **Figures 17 to 20**.



PM1 Collector Road. Existing view south west toward the Woodlawn Eco Precinct and proposed ARC building location.



PM1 Collector Road. Proposed view south west toward the Woodlawn Eco Precinct and ARC building.

Figure 17
Photomontage PM1

Leachate Treatment Plant

Woodlawn wind farm eastern turbine

Woodlawn Bioreactor

Evaporation Dam ED1

MBT Facility



PM2 Collector Road. Existing view south west to south east toward the encapsulation cell location

ARC Building

Leachate Treatment Plant

Woodlawn wind farm eastern turbine

Evaporation Dam ED1

Encapsulation cell final landform

RL815m
▽



PM2 Collector Road. Proposed view south west to south east toward the encapsulation cell and ARC Building

Figure 18
Photomontage PM2

Woodlawn Advanced Energy Recovery Centre LVIA

Woodlawn Bioreactor
beyond ridgeline

Woodlawn wind farm
eastern turbine



PM3 Taylors Creek Road. Existing view northeast in the direction of the Eco Precinct

ARC Building (shown in pink)
would be located beyond landform and not
visible from this location

Woodlawn wind farm
eastern turbine



PM3 Taylors Creek Road. Proposed view north east in the direction of the Eco Precinct

Lake George

MBT

Woodlawn wind farm
eastern turbine



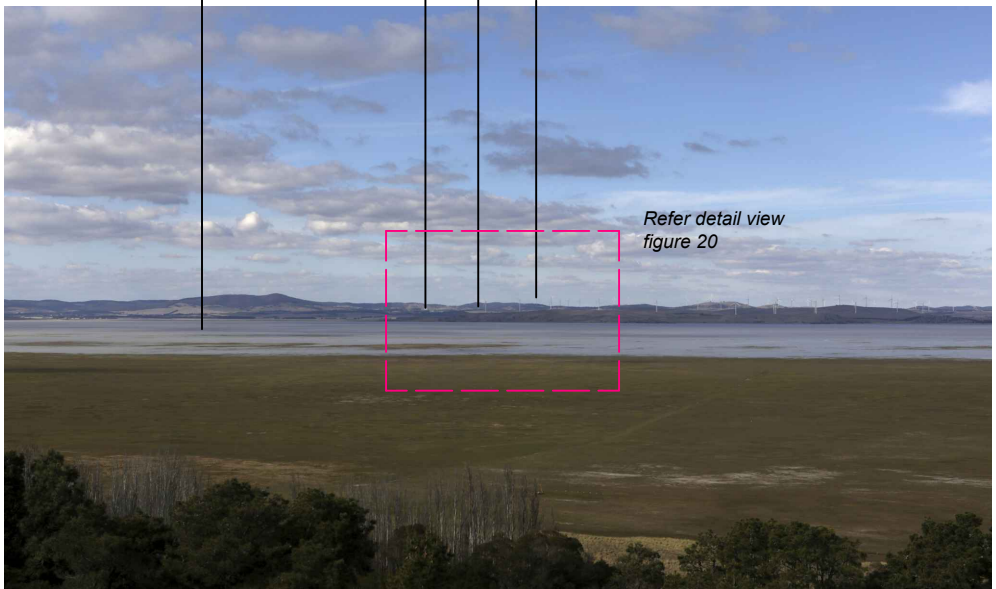
PM4 Weereewa Lookout

ARC Building roof and stack structure
visible below vegetated hillside beyond

Lake George

MBT

Woodlawn wind farm
eastern turbine



PM4 Weereewa Lookout view east to north east.

Figure 19
Photomontage PM3 & PM4

MBT

Lake George

ARC building roof and stack structure
visible below vegetated hillside beyond

Woodlawn wind farm
eastern turbine



PM4 Weereewa Lookout. Proposed view east to north east in the direction of the Eco Precinct and ARC building roof and stack.

Figure 20
Photomontage PM4 Detail

Woodlawn Advanced Energy Recovery Centre LVIA

Section 10 Cumulative impact assessment

10.1 Cumulative Impact Assessment

A cumulative visual impact could result from elements of the ARC building being constructed in conjunction with other existing or proposed developments which could be either associated or separate to it. Separate developments could occur or be located within a local context where visibility is dependent on a journey between each site or within the ARC building viewshed.

The ARC building would be located within the Eco Precinct which contains various built infrastructure. Existing built infrastructure includes the BioEnergy Power Station, onsite substation, MBT Facility, wind farm infrastructure, as well as visual features remnant from historic mining operations including exposed batter slopes and waste rock emplacements. In addition, there is built infrastructure associated with approved mining operations to the east of the ARC building.

Constructed elements associated with existing infrastructure are dispersed across the Eco Precinct area and are largely screened from surrounding view locations by landform and tree cover. Most existing infrastructure is small scale and comparable in line and form with existing agricultural structures found in the broader landscape. Existing large scale constructed elements, including the MBT Facility located in the western portion of the Eco Precinct, would not be visible within the same direct view as the ARC building.

The ARC building is considered to have limited potential to result in a significant cumulative visual impact in addition to existing large scale visual elements, including the wind turbines, located within and beyond the Eco Precinct. This is largely due to the extent of visual screening surrounding the Eco Precinct for most receiver viewpoints as well as the location of project elements relative to existing infrastructure.

Section 11 Mitigation measures

11.1 Mitigation measures

Mitigation measures should be considered to minimise the level of residual visual impacts during construction and operation. The mitigation measures generally involve reducing the extent of visual contrast between the visible portions of the ARC building structures and the surrounding landscape, and/or screening direct views toward the ARC building where possible.

11.2 Construction

Mitigation measures during construction should consider:

- minimise tree removal and/or protection of existing trees to be retained
- avoidance of temporary light spill beyond the construction site where temporary lighting is required
- appropriate selection of landscape plant materials and sizes to be installed around the ARC building and along the Collector Road corridor north of the encapsulation cell.

11.3 Operation

Mitigation measures during the operational period should consider:

- light installation to be designed and placed in accordance with AS 4282-2019, to minimise obtrusive effects
- ongoing maintenance and repair of constructed elements
- replacement of damaged or missing constructed elements and
- long term maintenance (and replacement as necessary) of tree planting within the Eco Precinct to maintain visual filtering and screening of external views.

Section 12 Conclusion

12.1 Summary

Undulating and ridgeline landscapes together with tree cover within and surrounding the Eco Precinct results in a relatively high VAC. The high VAC would tend to visually absorb changes associated with the project. The ARC building, IBA area and encapsulation cell are unlikely to result in a significant impact on the sensitivity of existing views.

Project elements, including the ARC building, IBA area, encapsulation cell and leachate evaporation pond, would not be inconsistent with the scale and form of existing buildings and structures within the surrounding landscape, and would not have a significant visual impact on dwellings within, and beyond, 5km of the proposed works. Dwellings and sensitive view locations beyond 5km would not have significant views toward the Eco Precinct with most views screened by undulating landform and/or tree cover.

The ARC building and encapsulation cell would be visible from a very short section of the Collector Road corridor (around 220m to 250m); however, views from the road corridor would be indirect, and very short term in duration less than 10 seconds from a moving vehicle.

A plume from the ARC stack may be visible at certain times. Plume visibility would be dependent on prevailing weather conditions and would not be expected to result in significant visual impacts.

Views from distant locations, including the Federal Highway and the Weereewa Lookout would not be impacted by the proposed works which would not form significant visual elements at distances more than 17km from the view locations.

This LVIA determined that the ARC building and the encapsulation cell would have a negligible visual impact on most people living/working in or travelling through the landscape surrounding the Eco Precinct.

The consideration and application of mitigation measures outlined in this LVIA would assist to minimise the relatively low visual impacts of the project.