



Mount Piper to Wallerawang Transmission Line Upgrade

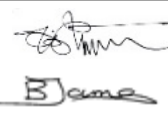
Technical Report 4 – Landscape Character and Visual Impact Assessment

Transgrid

August 2025

➔ **The Power of Commitment**



Project name		Mount Piper to Wallerawang Transmission Line Upgrade					
Document title		Mount Piper to Wallerawang Transmission Line Upgrade Technical Report 4 – Landscape Character and Visual Impact Assessment					
Project number		12612502					
File name		Mount Piper to Wallerawang Transmission Line UpgradeMP2W_LVIA.docx					
Status Code	Revision	Author	Reviewer		Approved for issue		
			Name	Signature	Name	Signature	Date
S4	0	D Taylor K Petersen	K Petersen B James		G Marshall		31/07/25
S4	1	B James	K Petersen		G Marshall		19/08/25

GHD Pty Ltd | ABN 39 008 488 373

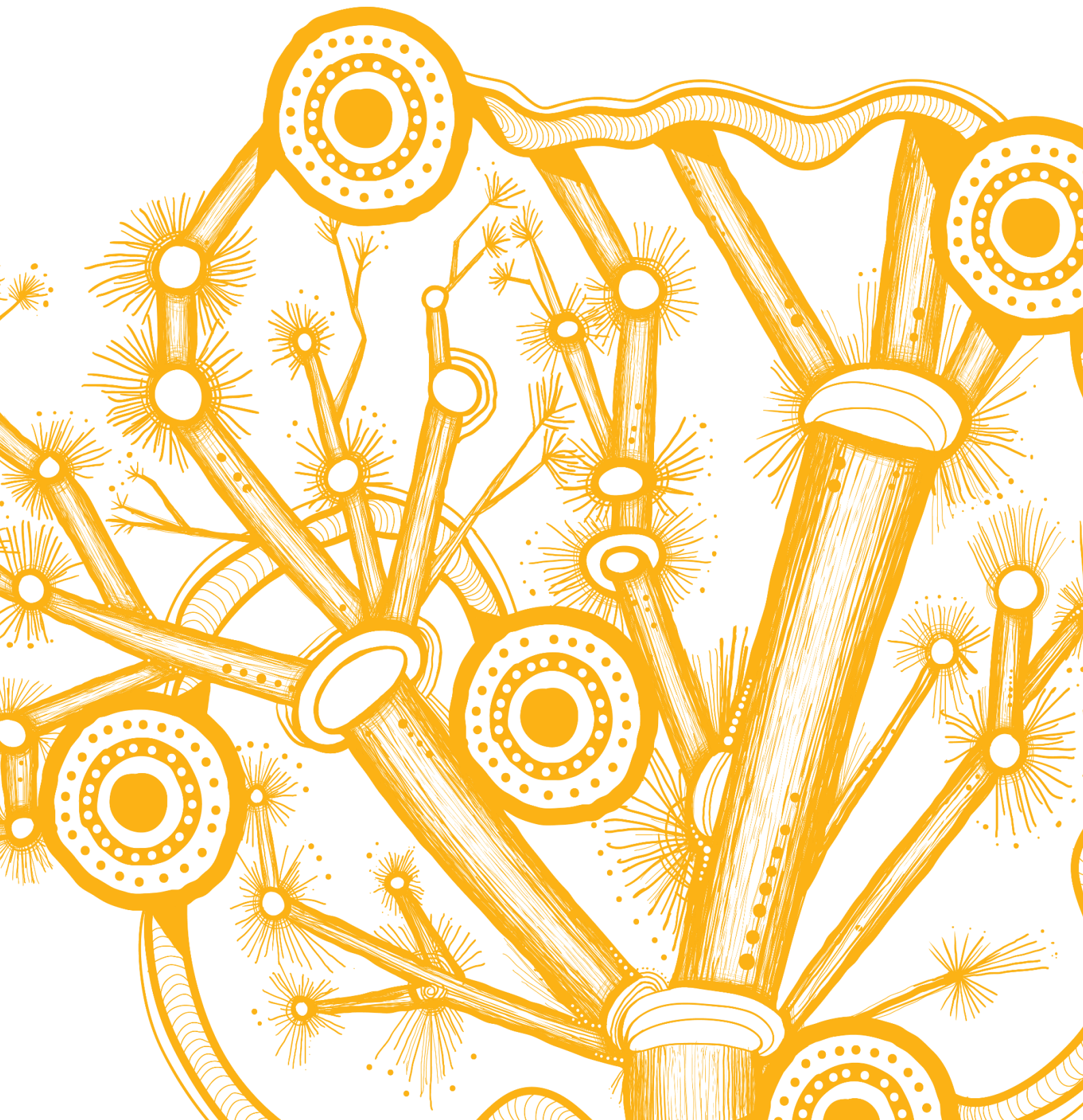
133 Castlereagh Street,
Sydney, New South Wales 2000, Australia
T +61 2 9239 7100 | **E** sydmail@ghd.com | **ghd.com**

© GHD 2025

This document is and shall remain the property of GHD. The document may only be used for the purpose for which it was commissioned and in accordance with the Terms of Engagement for the commission. Unauthorised use of this document in any form whatsoever is prohibited.

Acknowledgement of Country

Transgrid and GHD acknowledge Aboriginal and Torres Strait Islander peoples as the Traditional Custodians of the land, water and sky throughout Australia on which we do business. We recognise their strength, diversity, resilience and deep connections to Country. We pay our respects to Elders of the past, present and future, as they hold the memories, knowledges and spirit of Australia. Transgrid and GHD are committed to learning from Aboriginal and Torres Strait Islander peoples in the work we do.



Executive summary

The project

Transgrid proposes to deliver approximately eight kilometres (km) of new 330 kilovolt (kV) transmission line and double circuit transmission structures located between the Mount Piper and Wallerawang 330 kV substations (the project). The project would incorporate sections of an existing, single-circuit 132 kV transmission line, where the two transmission lines would share a widened easement and transmission structures. The project is located within the Central West region of NSW within the Lithgow Local Government Area (Lithgow LGA).

The project is identified in the NSW Network Infrastructure Strategy (EnergyCo 2023) and also supports the key tenets of the NSW Electricity Infrastructure Roadmap (DPIE 2020). The Roadmap identifies that the expansion of renewable generation must be accompanied by increased transmission capacity to transfer power from Renewable Energy Zones (REZ) in inland NSW to key demand centres. The Mount Piper to Wallerawang Transmission Line Upgrade Project would provide the additional capacity required to reliably transmit power from the Central West Orana REZ to the Greater Sydney region.

Purpose of this report

This landscape and visual impact assessment has been prepared as part of the Environmental Impact Statement (EIS) to assess potential visual impacts from the construction and operation of the project. The assessment has been undertaken in accordance with the Secretary's Environmental Assessment Requirements (SEARs).

Assessment methodology

The methodology used for preparing the assessment was guided by the NSW Government, Department of Planning, Housing and Infrastructure's (DPHI) *Technical Supplement – Landscape and Visual Impact Assessment, Transmission Guideline*, Version 1.1, April 2025 (the Supplement).

In accordance with the Supplement two study areas were identified, one for the landscape assessment and one for the visual impact assessment. The landscape assessment study area consisted of a 2 km buffer from the project footprint, while the visual impact assessment study area included a 1,125 metre (m) buffer from the project footprint.

The Supplement does not apply to the augmentation of existing transmission corridors or development immediately adjacent to existing transmission lines. This report was prepared considering the broad objectives and principles in the Supplement in relation to the identification of viewpoints and assessment of impacts.

Community engagement

Community engagement for the project has involved regular meetings with landowners, letter box drops, and direct consultation with those potentially affected by the project. Visual impact was raised as a key concern during the route selection process and community feedback informed the selection of a route that minimises impacts to private properties and visual amenity. Community values in relation to visual amenity were also considered in the assessment of viewpoint sensitivity and scenic quality and in the development of the mitigation measures.

Impact assessment

Landscape character impacts

The landscape character in the study area is typical of the Central-West region of NSW including areas of hilly, natural bushland and open, cleared rural to semi-rural farming and grazing lands. The study area also includes large areas of industry and electrical infrastructure such as substations, power stations, coal mining and transmission structures.

Four Landscape Character Zones (LCZs) were identified within the study area. The following landscape character impacts were identified:

- Moderate-low impacts on LCZ1 (Forested hills) and LCZ4 (Rural subdivision), primarily due to the natural values resulting from the presence of tracts of vegetation, including the Gardens of Stone State Conservation Area (SCA)

- Low impacts on LCZ2 (Agricultural lands) and LCZ3 (Industrial), primarily due to the presence of existing industrial infrastructure, such as transmission structures.

Visual impact assessment

There were approximately 269 private and nine public visual receivers identified in the study area. Eight private viewpoints were identified for a simple assessment in accordance with the Supplement. The simple assessment included a desktop review involving worst-case assumptions for sensitivity and magnitude. The eight private viewpoints considered in the simple assessment represented either a single visual receiver or a cluster of visual receivers that share similar views of the project.

Of the eight viewpoints included in the simple assessment, four viewpoints (VP01, VP04, VP05 and VP06) were identified as requiring detailed assessments due to a moderate or high overall visual impact rating in the simple assessment from their proximity to, and potential views of, new transmission structures by residential visual receivers. VP04 was not carried forward for further assessment due to the capacity of the landscape to absorb the new infrastructure and some screening of the view provided by trees, structures, and/or landform. As VP01 is an easement-affected property, a detailed assessment for this visual receiver is not required as per the Supplement.

A low overall visual impact rating was assessed for VP05 (a residential dwelling view from Duncan Street, Lidsdale) while a moderate rating was assessed for VP06 (a residential dwelling view from on a rural property at Brays Lane, Wallerawang) through the preparation of photomontages and grid overlays that assisted in the determination of the magnitude ratings.

Nine public visual receivers were identified consisting of five road corridor locations and four public places. Road corridors included local roads such as Brays Lane. Public open space visual receivers included the commercial area along Main Street north of the Wallerawang town centre, Lake Wallace foreshore camping area, the Barton Park Cemetery and Rangers Park.

All but two of the public visual receivers, Castlereagh Highway (VP09) and Brays Lane (VP12) were identified as having either low or very low visual impacts, primarily due to very low or low scenic quality ratings from the presence of existing transmission lines and other industrial infrastructure in the views, distance, landform and/or intervening vegetation reducing visibility of the project. It was determined that further assessments for VP09 and VP12 was not warranted owing primarily to the very low scenic quality of the views due to the existing transmission lines and other industrial infrastructure such as the coal loader and the very low visual sensitivity of the visual receivers using a highway or Brays Lane.

Night lighting and air traffic

No operational lighting impacts are anticipated as there is no permanent lighting proposed. There may be construction lighting impacts during night works where construction occurs near residential dwellings such as near VP05 and VP06.

During the winter months there is potential for some works requiring lighting during proposed project construction hours; however, these would cease at 6pm daily across the project footprint, except in construction compounds, which would operate until 7pm Monday to Friday.

The use of night lighting would also be required where out-of-hours work is required, such as during outage recalls or stringing work over road or rail corridors. Such work is expected to be infrequent and of a duration of up to 72 hours, however could impact receivers on more than one occasion. It is expected to be infrequent; however, evening and night work may be required in the vicinity of some dwellings multiple times during the construction of the project.

Visual impacts from night lighting could be mitigated by directing construction lighting away from residential receivers.

There were no visual impacts identified to commercial aircraft including on any certified aerodrome or aircraft flights due to the relative distance from the nearest airfield. Aircraft passengers would be in an elevated position taking in a relatively broad landscape, resulting in a lack of any discernible changes to views.

Cumulative impacts

Of the 10 projects reviewed as part of the cumulative impact assessment, two projects (Great Western BESS and Pinecrest BESS) were identified as having potential cumulative visual impacts due to their location within views from VP06. The presence of operational infrastructure associated with these two projects, coupled with the project's visible infrastructure have the potential to intensify impacts on VP06 due to the introduction of additional electrical infrastructure from this viewpoint. The introduction of the Pinecrest BESS into the view at VP06 (identified visual receiver in Pinecrest BESS scoping report (AECOM 2022)), would result in a greater intensification of electrical infrastructure with more ground level elements of the BESS being introduced into the viewpoint.

The project is expected to have relatively low potential cumulative impacts on the wider landscape as it would become part of a landscape already comprising numerous large, industrial structures from electricity generation, transmission lines, coal mining, processing and transport and agricultural activities within the study area. The project's cumulative impacts are therefore considered to contribute to low cumulative impacts within the overall landscape.

Recommended mitigation measures

Vegetation clearing will be minimised to the extent practicable to minimise the extent of landscape character and visual impacts. This is particularly important in LCZ1 where it will assist in the preservation of the natural, bushland character.

Proposed mitigation measures that could further assist in reducing the visual impacts to private property (VP06) include planting vegetation to screen views of the project. Where night works are required, construction lighting should also be designed to minimise impacts on nearby residential receivers.

Contents

Key terms, acronyms and abbreviations	vii
1. Introduction	1
1.1 Background	1
1.2 Location	1
1.3 The project	3
1.4 Environmental assessment requirements	7
1.5 Purpose of this report	7
2. Relevant policy and guidelines	8
2.1 Landscape and visual impact guidelines	8
2.2 State and regional planning	8
2.3 Local planning documents	9
3. Methodology	10
3.1 Application of the Supplement	10
3.2 Study areas	10
3.3 Aerial Imagery used within this report	11
3.4 Identification of viewpoints	11
3.5 Site inspections	12
3.6 Landscape character impact assessment	12
3.7 Visual impact assessment	16
3.8 Cumulative impacts	22
3.9 Night lighting and views from the air	23
3.10 Panoramas and photomontages	23
3.11 Mitigation and management measures	24
4. Existing environment	25
4.1 Regional and local context	25
4.2 Topography	25
4.3 Vegetation	28
4.4 Land zoning	30
4.5 Heritage	30
4.6 Landscape character zones	33
4.7 Community and stakeholder engagement	39
5. Landscape character assessment	40
5.1 LCZ1 – Forested hills	40
5.2 LCZ2 – Agricultural lands	41
5.3 LCZ3 – Industrial	42
5.4 LCZ4 – Rural suburban development	43
6. Visual impact assessment	44
6.1 Viewshed analysis	44
6.2 Results of the simple assessment	44
6.3 Detailed viewpoint assessment	45
6.4 Public viewpoints	55
6.5 Night lighting impacts	56

6.6	Air traffic impacts	57
7.	Cumulative impacts	58
8.	Performance objectives and mitigation	63
8.1	Performance objectives	63
8.2	Mitigation measures	63
9.	Conclusion	64
9.1	Summary of landscape character assessment	64
9.2	Summary of visual impact assessment	64
10.	References	66

Table index

Table 1.1	The project	3
Table 1.2	SEARs requirements - Visual	7
Table 2.1	Central West and Orana Regional Plan 2041 relevant objectives	8
Table 2.2	Lithgow LEP objectives	9
Table 3.1	Magnitude of change criteria (landscape)	16
Table 3.2	Landscape character impact rating matrix (Transport for New South Wales, 2023)	16
Table 3.3	Viewpoint sensitivity levels and examples	18
Table 3.4	Frame of reference and visual reference for scenic quality values	19
Table 3.5	Visual sensitivity rating matrix	20
Table 3.6	Potential magnitude thresholds	21
Table 3.7	Visual impact rating matrix	21
Table 3.8	Magnitude of change criteria (visual impact)	22
Table 3.9	Requirements for capturing panorama photographs	23
Table 3.10	Visual performance objectives	24
Table 4.1	Vegetation groups	28
Table 5.1	LCZ1 impact assessment	40
Table 5.2	LCZ2 impact assessment	41
Table 5.3	LCZ3 impact assessment	42
Table 5.4	LCZ4 impact assessment	43
Table 6.1	Simple assessment ratings	44
Table 6.2	VP05 detailed visual impact assessment	49
Table 6.3	VP06 detailed visual impact assessment	52
Table 7.1	Potential cumulative impacts of relevant future projects	60
Table 8.1	Landscape and visual impact mitigation and management measures	63
Table 9.1	Landscape character impact assessment summary for construction and operation	64
Table 9.2	Detailed visual impact assessment summary	64

Figure index

Figure 1.1	Project location and regional context	2
Figure 1.2	Key features of the project	6
Figure 3.1	Extent of the scoping study area	11
Figure 3.2	Study areas	14
Figure 3.3	Conservative vertical field of view	20
Figure 4.1	Topography	27
Figure 4.2	Vegetation groups	29
Figure 4.3	Land zoning	31
Figure 4.4	Heritage items	32
Figure 4.5	Landscape character zones	34
Figure 4.6	LCZ1 character images	35
Figure 4.7	LCZ2 character images	36
Figure 4.8	LCZ3 character images	37
Figure 4.9	LCZ4 character images	38
Figure 6.1	Viewshed analysis and viewpoints	46
Figure 6.2	VP05 existing view	51
Figure 6.3	VP05 proposed view with new transmission line infrastructure	51
Figure 6.4	VP06 existing view, location of existing 132 kV transmission line, with existing structures to be replaced shown with green arrows	54
Figure 6.5	VP06 proposed view with new transmission line infrastructure	54
Figure 7.1	Projects considered for cumulative impacts	59

Appendices

Appendix A	Photomontages
Appendix B	Scoping Stage ZTV
Appendix C	Heritage listings
Appendix D	Visual receiver locations

Key terms, acronyms and abbreviations

Term	Description
ACHAR	Aboriginal Cultural Heritage Assessment Report
AHIMS	Aboriginal Heritage Information Management System
BESS	Battery Energy Storage System
CWO REZ	Central-West Orana Renewable Energy Zone
DPE	Department of Planning and Environment
DPHI	Department of Planning, Housing and Infrastructure
DPIE	Department of Planning, Industry and Environment
Easement	A legal property right attached to a parcel of land that enables the use of an identified part of the land by a third party other than the owner. For transmission lines, an easement defines the corridor area where the lines are located and that allows access, construction and maintenance work to take place. The easements for the 330 kV transmission lines would typically be 60 metres wide. The easement grants a right of access and for construction, maintenance and operation of the transmission line and other operational assets. For the project, some easements may overlap with existing easements such that the final easement width for the new easement would be narrower than 60 m (e.g. where paralleling the existing transmission line north of the Wallerawang 330 kV substation) and in other areas it may be wider to accommodate diverging transmission lines (e.g. in the area south of the Mount Piper 330 kV substation).
EIS	Environmental Impact Statement
GIS	Geographic Information System
GPS	Global Positioning System
km	Kilometre
kV	Kilovolt
Landscape	A holistic area comprised of its various parts including landform, vegetation, buildings, villages, towns, cities and infrastructure.
Landscape character	The combined quality of built, natural and cultural aspects which make up an area and provide its unique sense of place.
Landscape assessment study area	Study area used for the landscape character assessment consisting of a 2 km buffer of the project. Further details of this area are found in section 3.2.1.
Landscape character zone	An area of landscape with similar properties or strongly defined spatial qualities, distinct from areas immediately nearby.
LCZ	Landscape Character Zone
LVIA	Landscape and Visual Impact Assessment
LEP	Local Environment Plan
LGA	Local Government Area
m	Metre
Magnitude	The apparent size of a project in the landscape or when viewed from a given viewpoint.
MW	Megawatt
MWh	Megawatt-hour
NSW	New South Wales
PAD	Potential Archaeological Deposit
PCT	Plant Community Type

Term	Description
Project	The CSSI project “Mount Piper to Wallerawang Transmission Line Upgrade Project”, which is the subject of this Environmental Impact Statement. The project involves the construction and operation of high voltage transmission lines between the 330 kV Mount Piper and Wallerawang substations.
Project footprint	Area that is to be directly affected by the construction and operation of the project.
REZ	Renewable Energy Zones
Reduced level or RL	The elevation of a point relative to a known reference datum to indicate height above sea level or another fixed benchmark.
SCA	State Conservation Area
SEARs	Secretary’s Environmental Assessment Requirements
Sensitivity	The capacity of a landscape or viewpoint to absorb the impacts from a proposed land use change and/or built form.
SSI	State Significant Infrastructure
The Supplement	<i>Technical Supplement - Landscape and Visual Impact Assessment, Transmission Guideline</i> version 1.1 (NSW Department of Planning, Housing and Infrastructure, 2025)
TL	Transmission line
TS	Transmission structure
Transmission structure	All structures supporting transmission lines including poles, towers and pylons
View	The sight of a landscape or scene
Viewpoint	A location within the public or private domain with a potential view of the project
Viewshed	The area within which a project can be seen at eye level above ground. Its extent will usually be defined by a combination of landform, vegetation and built elements.
Visibility	The state or fact of being visible or seen.
Visual assessment study area	Study area used for viewpoint selection, the zone of theoretical visibility, and the visual impact assessment consisting of a 1.125 km buffer of the project. Further details of this area are found in section 3.2.2.
Visual impact	The impact on views from private and public places. It is determined by considering the visual magnitude and sensitivity.
Visual receiver	Individuals and/or groups of people who have the potential to be affected by views of or towards the project.
Zone of theoretical visibility or ZTV	A map, usually digitally produced, showing areas of land within which a development is theoretically visible.

1. Introduction

1.1 Background

The Commonwealth and NSW governments have both established targets to achieve net-zero emissions by 2050. Achieving these targets requires low emissions technologies to be deployed at scale across all sectors of the economy, including the electricity generation sector, currently Australia's largest source of greenhouse gas emissions.

The NSW Transmission Infrastructure Strategy (DPE 2018) aims to engage the private sector to invest in priority energy infrastructure projects, which can deliver low-cost, clean and reliable energy to consumers

As part of the Transmission Infrastructure Strategy, the NSW Government has developed a plan to establish five Renewable Energy Zones (REZs) to increase renewable energy generation, reduce carbon emissions, and help deliver lower wholesale electricity costs to consumers. The Central-West Orana REZ (CWO REZ), being the first REZ established, is planned to generate at least 4.5 gigawatt by the late-2020s.

The NSW Government's Electricity Infrastructure Roadmap (DPIE 2020) identifies that the expansion of renewable generation must be accompanied by increased transmission capacity to transfer power from REZs in inland NSW to key demand centres. Interest in new energy generation projects in the CWO REZ is forecasted to exceed the existing transmission network capacity in several locations. The existing infrastructure located between the Mount Piper 550/330 kilovolt (kV) substation (Mount Piper 330 kV substation) and the Wallerawang 330/132 kV substation (Wallerawang 330 kV substation) has been identified in the NSW Network Infrastructure Strategy (EnergyCo 2023) as requiring upgrades. The Mount Piper to Wallerawang Transmission Line Upgrade Project (the project) would provide the additional capacity required to reliably transmit power from the CWO REZ to the Greater Sydney region.

1.2 Location

The project is located within the Central West region of NSW within the Lithgow City Council Local Government Area (LGA). It is located approximately 14 kilometres (km) north-west of Lithgow situated on the western fringes of the Blue Mountains (Figure 1.1).

The area that is to be directly affected by the construction and operation of the project, is referred to as the project footprint and is shown in Figure 1.1. The project footprint is approximately 86.5 hectares in size and is generally bounded by the following:

- Castlereagh Highway to the north
- Former Wallerawang Power Station site to the east
- Gardens of Stone State Conservation Area (SCA) to the south
- Mount Piper Power Station to the north-west.

Land uses within and adjacent to the project footprint include:

- Electricity generation at Mount Piper Power Station
- Electricity transmission, including the Mount Piper and Wallerawang 330 kV substations, and associated transmission lines
- Mining activities, with several Centennial Coal operations including the former Ivanhoe Coal Mine and Springvale Coal Services overlapping the project footprint
- Agriculture, primarily livestock grazing
- Conservation, notably the Gardens of Stone SCA
- State and local road reserves including the Castlereagh Highway, Boulder Road and Brays Lane
- Rail corridors including the Main Western Rail Line and a disused railway line near Brays Lane.

A mixture of land uses are proposed at the former Wallerawang Power Station site. This may include commercial and industrial land use. Development of a Battery Energy Storage System is also proposed at the site.

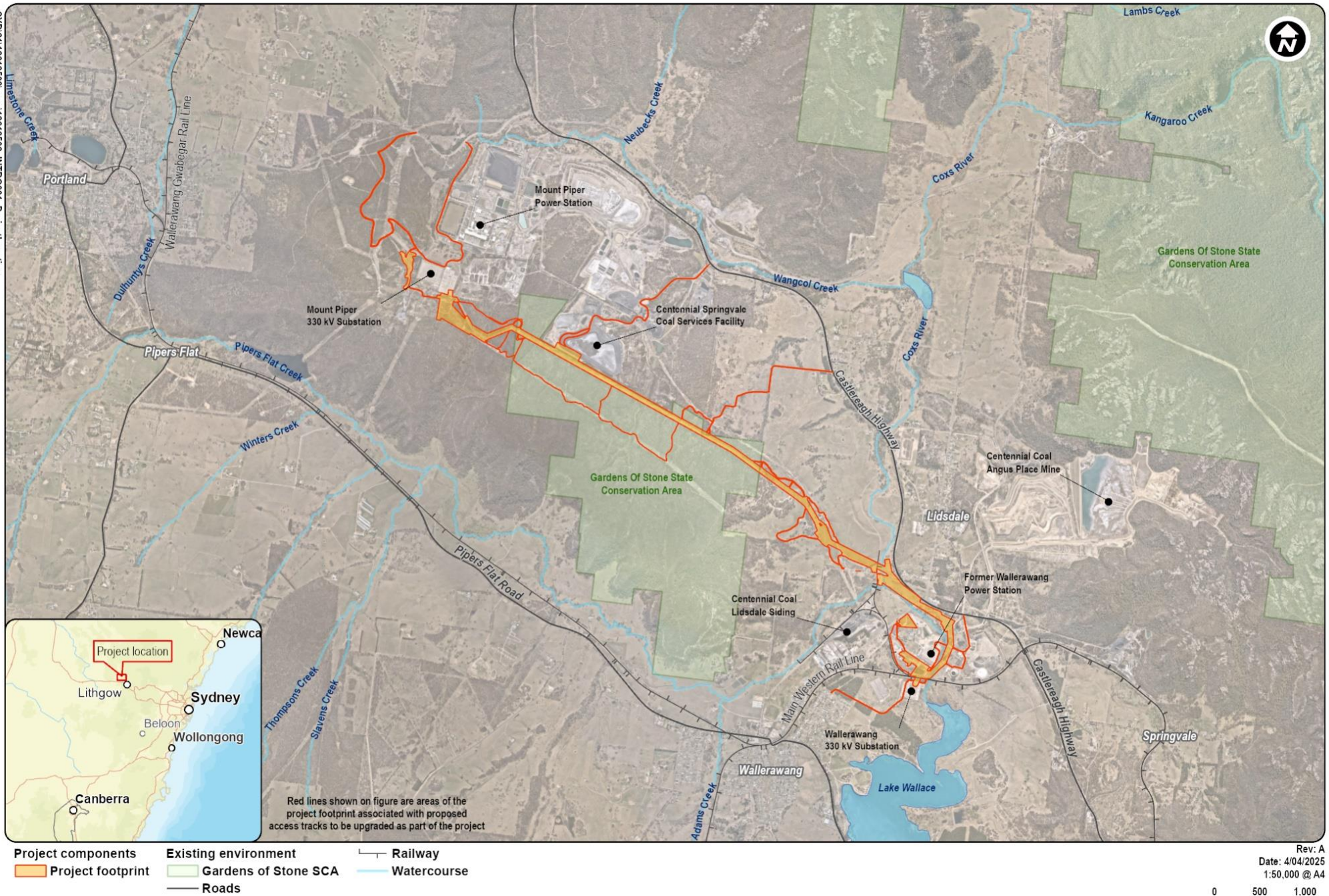


Figure 1.1 Project location and regional context

1.3 The project

The project would involve construction and operation of approximately 8 km of new 330 kV transmission line between the Mount Piper and Wallerawang 330 kV substations as shown in Figure 1.2. The project would also include the replacement of transmission structures, partial adjustment of existing transmission lines, permanent and temporary access tracks, construction compounds and laydown areas.

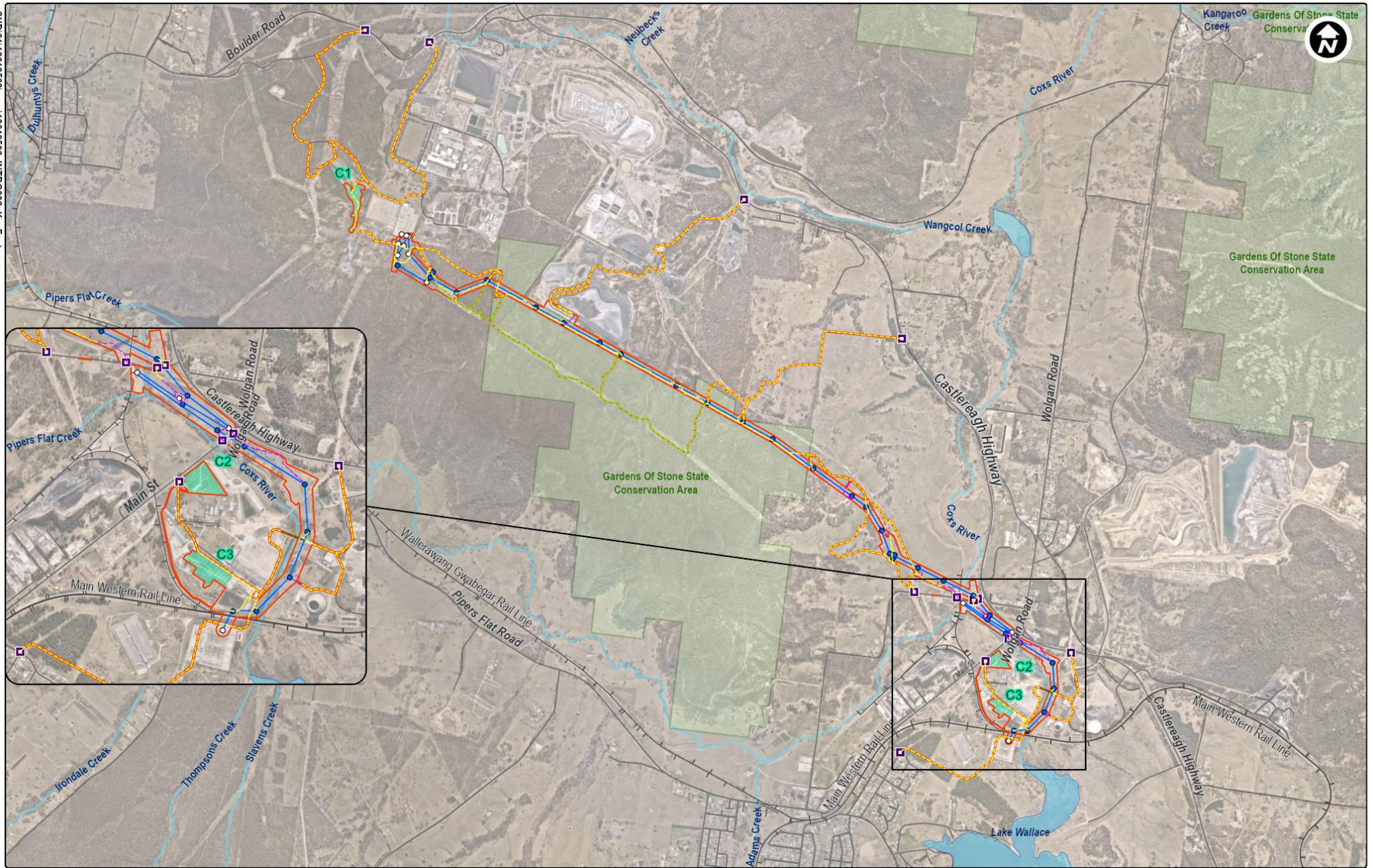
Table 1.1 outlines the key features of the project. The description of the project in Table 1.1 is based on the current concept design. Further detail is provided in Chapter 3 of the Environmental Impact Statement (EIS). The project will continue to be refined as part of detailed design.

Table 1.1 *The project*

Feature	Description
Design	
Transmission line and easement	Approximately 8 km of new 330 kV transmission line between the existing Mount Piper 330 kV and Wallerawang 330 kV substations that would include (from west to east): – widening of approximately 0.5 km of existing easements in the vicinity of the Mount Piper 330 kV substation by up to 40 m to accommodate the new 330 kV transmission line and adjustments to existing 132 kV and 330 kV transmission lines – widening of the existing 132 kV easement from 45 m to 60 m for 4.8 km to accommodate double circuit transmission structures for the existing 132 kV transmission line and the new 330 kV transmission line – installation of two 132 kV pole structures where the existing 132 kV transmission line is restrung onto the new double circuit transmission structures – construction of 1.2 km of new 330 kV transmission line from the existing 132 kV transmission line south-east to the intersection of Main Street and the Castlereagh Highway on a 60 m easement – construction of 1.5 km of new 330 kV transmission line on a 40 m easement running parallel to existing 330 kV transmission lines for approximately 1.1 km and then diverging and widening to 60 m for the remaining 0.4 km to the Wallerawang 330 kV substation. The standard easement widths for 132 kV and 330 kV transmission lines are 45 m and 60 m respectively. However, easements may vary in width where multiple transmission lines converge/ diverge or where they overlap with an existing easement.
Transmission structures	Transmission structures for the project include approximately 28 new steel lattice towers and four steel and/or concrete pole structures. Transmission structures would range in height from approximately 14 to up to 60 m, however these heights would be subject to detailed design. The image below presents an indicative illustration of the types of structures proposed for the project and their maximum heights. The steel transmission structures would generally be spaced between 100 m to 550 m apart and the pole structures about 30 m to 50 m apart. New conductors, earth wires and optical ground wire (OPGW) would be installed on the new transmission structures for the new 330 kV and existing 132 kV lines.

Feature	Description																																																																																																																														
	Local adjustment of existing transmission structures would be required in the vicinity of the Mount Piper 330 kV substation to minimise crossover of transmission lines. Redundant transmission structures, including the gantry immediately north of the Main Western Rail Line, would be removed and recycled, where possible.																																																																																																																														
Construction																																																																																																																															
Program	Construction of the project would commence once all necessary approvals are obtained. It is anticipated that construction would commence in late 2026. Construction would be undertaken in stages over a period of approximately 20 months. The key activities and their indicative durations shown in the below table. <table><tr><th>Activity</th><th>1</th><th>2</th><th>3</th><th>4</th><th>5</th><th>6</th><th>7</th><th>8</th><th>9</th><th>10</th><th>11</th><th>12</th><th>13</th><th>14</th><th>15</th><th>16</th><th>17</th><th>18</th><th>19</th><th>20</th></tr><tr><td>Site establishment</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>Civil works</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>Assembly of structures</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>Testing and commissioning</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>De-mobilisation</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>	Activity	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Site establishment																					Civil works																					Assembly of structures																					Testing and commissioning																					De-mobilisation																				
Activity	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20																																																																																																											
Site establishment																																																																																																																															
Civil works																																																																																																																															
Assembly of structures																																																																																																																															
Testing and commissioning																																																																																																																															
De-mobilisation																																																																																																																															
Construction methodology	Construction of the project would include: – site establishment including vegetation removal, construction compound establishment, access track construction and upgrade – removal of existing transmission structures where required – civil works involving earthworks and establishment of construction benches for each transmission structure, and establishment of brake and winch sites – construction of footings and foundation work for the new transmission structures – assembly and erection of new transmission structures – stringing of conductors.																																																																																																																														
Construction hours	The proposed construction working hours for the project are 7 am to 7 pm Monday to Sunday. Out-of-hours construction work will likely be required between 7 pm to 7 am Monday to Sunday and public holidays, to align with scheduled outages. Justification for the out-of-hours works includes: – proximity to live transmission lines requiring the work to be completed under a scheduled outage for network and personnel and contractor safety – the need to complete works within a limited time window to meet a timeframe to re-energise the transmission line to avoid disruption to customers – minimising disruptions to the use of the Main Western Rail Line during stringing.																																																																																																																														
Construction workforce	Expected to peak at about 150 personnel and contractor, with an average workforce of about 60 personnel and contractor.																																																																																																																														
Construction compounds and laydown areas	A total of three construction compounds would support the construction of the project. One would be located at the western end of the project near the Mount Piper 330 kV substation and two located at the eastern end of the project within the former Wallerawang Power Station site. The locations of these compounds are shown in Figure 1.2. Laydown of materials (e.g. poles, cable drums, other large equipment, etc.) would also occur at specified locations along the easement within the project footprint, particularly at transmission structure locations.																																																																																																																														
Access	To facilitate efficient construction access, the following is required: – upgrading and widening of approximately 25 km of existing access tracks to at least 6 m, with some sections widened up to 10 m due to local topography – construction of approximately 2 km of new 6 m wide access tracks. In addition to those tracks, approximately 4 km of existing track would be used only by light vehicles. The light vehicle tracks may require minor repairs (for example, filling potholes), but would not be graded or widened. The project footprint would be accessed from public roads at 13 access points, with the majority of these being existing property access points.																																																																																																																														

Feature	Description
	Existing access tracks would be used in preference to new tracks wherever possible. Access track upgrades and widening would include required drainage. Access points and access tracks established for the construction of the project that are not required for future operation and maintenance activities would be returned to pre-project conditions, subject to agreement with landowners.
Utility adjustments and infrastructure crossings	The new transmission line would need to cross the following utilities and infrastructure: – water pipeline operated by WaterNSW – distribution lines operated by Endeavour Energy – rail signal power supply – council drainage and other assets – public roads at Brays Lane and Main Street – rail lines at the Main Western Rail Line and the disused rail line travelling north of Brays Lane. It is not currently anticipated that the project would require the adjustment of any nearby utilities. Further investigations and consultation with asset owners would be undertaken during detailed design.
Vegetation clearing	The project would require the clearance of vegetation for a number of activities including but not limited to building new access tracks and widening existing ones, establishment of construction compounds, laydown areas, and brake and winch sites, construction of the transmission structures, and establishing and maintaining the vegetation clearance requirement for the transmission lines. Vegetation clearing would be undertaken either with the use of machinery or manually, where it is unsafe to operate machinery, or when access is limited. Root balls would be retained where possible. Clearing methods would be determined with consideration to vegetation type or structure, slope and terrain, and environmental and ecological constraints. Removed vegetation, which is weed free, would be mulched for beneficial reuse, where appropriate. Areas cleared for construction, that are not needed for operation of the project, would be rehabilitated to a stable and weed free condition.
Testing and commissioning	Testing and structure checks would form part of the final construction and installation work. These activities would ensure the project has been installed in accordance with the design and statutory standards and is safe to proceed to commissioning which would include, but not be limited to: – transmission line cut-in and connection to the electrical network – protection, control and metering checks – high voltage equipment operation and energisation – post commissioning testing and verification.
Demobilisation and rehabilitation	Upon completion of the construction works, all construction equipment, temporary fencing and waste would be removed. All disturbed areas would be rehabilitated to a stable, weed-free condition, unless designated as a permanent access track. This would include spreading topsoil, cleared and stockpiled at the beginning of construction, across the disturbed area to stabilise it to a state where natural regrowth can occur.
Operation	
Design life	About 50 years.
Maintenance	All project infrastructure would require regular maintenance to maintain serviceability and maximise its operational life. Maintenance activities would include: – transmission structure monitoring – annual aerial inspection – routine vegetation management on the easement and in the hazard tree zone – access tracks would be maintained in a trafficable condition. Should any irregularities be identified following routine inspections, a work crew would be dispatched from existing Transgrid maintenance depots to rectify any defects found. Periodic inspection and maintenance work would be managed by Transgrid as part of existing operations, with no additional personnel requirements.



- | | |
|---|--|
| Project components
— Project footprint
— New and adjusted transmission line
● Proposed transmission structure
○ Existing transmission structure to be reused | Construction compounds
— Access tracks - new
— Access tracks - minor upgrades as required (light vehicles only)
— Access tracks - upgrade and widen
— Access tracks - existing (no change)
■ Access point |
|---|--|

- | |
|---|
| Existing environment
— Gardens of Stone SCA
— Roads
— Railway
— Watercourse |
|---|

Rev: A
 Date: 7/07/2025
 1:40,000 @ A4
 0 500 1,000
 Metres
 Grid: GDA2020 MGA Zone 56

Figure 1.2 Key features of the project

1.4 Environmental assessment requirements

This Landscape and Visual Impact Assessment (LVIA) has been prepared to address the Secretary's Environmental Assessment Requirements (SEARs) issued on 22 May 2025. Table 1.2 includes the requirements relevant to this assessment and where they are addressed in the LVIA.

Table 1.2 SEARs requirements - Visual

Requirements	Where addressed in this report
Key issues – Landscape and visual	
A detailed assessment of the visual impacts of all components of the project in accordance with the <i>Transmission Guideline</i> and supporting <i>Technical Supplement for Landscape Character and Visual Impact Assessment</i>	This report Section 3.1 (Application of the Technical Supplement)

1.5 Purpose of this report

This LVIA has been prepared by GHD as part of the Environmental Impact Statement (EIS) for the project. The purpose of this report is to assess potential landscape character and visual impacts from the construction and operation of the project, and where required, identify feasible and reasonable mitigation and management measures.

The report is structured as follows:

- Section 1 – provides background information and an overview of the project and assessment.
- Section 2 – Provides an outline of the key legislative requirements and policy guidelines relating to the project.
- Section 3 – describes the methodology used for the purposes of this assessment.
- Section 4 – provides an overview and describes the landscape and visual environment within the study area.
- Section 5 – assesses the landscape character impacts on landscape character zones.
- Section 6 – identifies and assesses visual impacts of the project on visual receivers. This includes night lighting and air traffic visual impacts.
- Section 7 – provides a discussion of potential cumulative impacts.
- Section 8 – recommends mitigation measures in response to issues arising in the assessment during construction and operation.
- Section 9 – presents a summary of the LVIA.

2. Relevant policy and guidelines

2.1 Landscape and visual impact guidelines

The Department of Planning, Housing and Infrastructure's (DPHI) *Transmission Guideline Technical Supplement for Landscape Character and Visual Impact Assessment* (the Supplement) (2025, Version 1.1), is used to guide the Landscape and Visual Impact Assessment of new transmission infrastructure in NSW.

Section 1.2 of the Supplement states:

This technical supplement does not apply to the augmentation of existing transmission corridors or development immediately adjacent to existing transmission lines.

As the project involves the augmentation of an existing transmission corridor, with the proposed transmission line replacing or running adjacent to existing transmission lines, the Supplement does not apply to this project in accordance with Section 1.2 of the Supplement.

Although the Supplement does not apply to this LVIA, some of the methodologies in the Supplement have been applied to ensure an appropriate level of assessment. The overall aim was to satisfy the Supplement's objectives and principles to help ensure that best practise outcomes are achieved. Further information on what methodologies were applied from the Supplement is described in section 3.1.

This LVIA also is also informed by *Guidelines for Landscape and Visual Impact Assessment, 3rd Edition*, Landscape Institute and Institute of Environmental Management & Assessment, 2013.

This LVIA provides an assessment of the impacts from both the construction and operational phases of the project.

2.2 State and regional planning

The following sections identifies key planning documents which are considered relevant to providing context for landscape and visual impacts of the project.

2.2.1 Central West and Orana Regional Plan 2041

The project is located near Lithgow in the eastern section of the Central West Orana region and central west of NSW. The *Central West and Orana Regional Plan* (NSW Department of Planning and Environment, 2022) sets out a 20-year strategic framework to guide land use planning decisions in the region by the NSW Government. Objectives outlined in the plan, relevant to the project and this LVIA, refer Table 2.1.

Table 2.1 Central West and Orana Regional Plan 2041 relevant objectives

Objective	Relevance to the project/report
Objective 9 <i>Ensure site selection and design embraces and respects the region's landscape, character and heritage</i>	This objective emphasises the importance of landscape character and heritage places including the Gardens of Stone SCA bushland, rural landscape and heritage associated with Wallerawang's Main Street and railway. Scenic and heritage values associated with these landscapes should be considered in this LVIA.

2.2.2 Gardens of Stone State Conservation Area – Plan of Management

The Gardens of Stone SCA is described in the *Gardens of Stone State Conservation Area Plan of Management* (NSW National Parks & Wildlife Service, 2022) as “an area of outstanding natural and cultural value” and “an outstanding destination that will attract visitors and support the continued growth of the Lithgow region's economy” (NSW National Parks & Wildlife Service, 2022). The Plan of Management outlines objectives to conserve the natural and cultural values of the Gardens of Stone SCA, while also enabling the continued operation of existing mining infrastructure. While only a small area of the Gardens of Stone SCA falls within the project study area, this LVIA considers the values associated with the SCA area when assessing landscape character and visual impacts.

2.3 Local planning documents

The following sections identifies key local planning documents which are considered relevant to providing context for landscape and visual impacts of the project.

2.3.1 Lithgow 2040 Local Strategic Planning Statement

The Local Strategic Planning Statement provides a strategic direction for the growth of the Lithgow region and identifies a number of community values from consultation processes. Two key community values identified that are relevant to this LVIA include:

- *scenic and conservation areas/landscapes, and*
- *local character and identity.*

The vision expressed in the Local Strategic Planning Statement focuses on maintaining and protecting the rural character and identity of small towns within the Lithgow region, including Wallerawang. These rural values, as well as the scenic and conservation values associated with the Gardens of Stone SCA are considered as part of this LVIA.

The Local Strategic Planning Statement also identifies Wallerawang as a sub-regional centre of Lithgow and introduces the industrial opportunities in Wallerawang as part of Planning Priority 9 (*Attract Investment and Grow Local Jobs: Industrial*). For example, plans to potentially repurpose the former Wallerawang Power Station into an eco-industrial business park potentially shifts land use away from rural to more industrial and commercial uses thereby potentially changing landscape character of the locality.

2.3.2 Lithgow Local Environment Plan 2014

The *Lithgow Local Environment Plan 2014* (the LEP) outlines proposed land uses in the Lithgow LGA. The key relevant objectives are included in Section 1.2 of the LEP and with these objectives summarised in Table 2.2 along with the relevance to the project.

Table 2.2 *Lithgow LEP objectives*

Objective	Relevance to project/report
2(a) <i>to encourage sustainable and planned development that complements the unique character and amenity of Lithgow and enhances its towns, villages and rural areas</i>	The project is located within a predominately rural landscape with contrasting industrial uses such as mining operations, power and electricity infrastructure including transmission lines as well as areas of natural bushland associated with the Gardens of Stone SCA. The character therefore consists of both natural and man-made elements that define a predominantly peri-urban character. This hybrid landscape character should therefore be considered in this assessment with respect to the objective.

3. Methodology

3.1 Application of the Supplement

As detailed in section 2.1, due to the project location within or adjacent to existing transmission line easements the Supplement does not apply to the project as detailed in Section 1.2 of the Supplement.

Section 1.2, application of the technical supplement, states:

“Any landscape or visual impact assessment for projects of this nature should recognise the impact of existing transmission lines and consider the extent to which new transmission lines would incrementally increase the visual impacts.”

Although the Supplement does not apply to this LVIA, it was decided to adopt particular methodologies within the Supplement to help ensure that the project was appropriately assessed using relevant guidelines by considering the Supplement’s broad objectives and principles thereby ensuring best practise outcomes were achieved.

The following aspects from the Supplement have been considered as part of the methodology for this assessment:

- Landscape character assessment including landscape character zones and impact assessment for both construction and operation
- Visual impact assessment including simple assessment (private and public viewpoints) and detailed assessment (private viewpoints only).

The application of the Supplement is outlined in the following sections.

The following elements of the LVIA were not undertaken in line with the Supplement:

- Viewshed mapping undertaken as part of the scoping phase detailed in the scoping report for the project.
- Establishment of the landscape assessment study area has adopted a 2 km buffer of the project footprint and not the generally recommended 5 km buffer in the Supplement for the reasons outlined in section 3.2.1. It is noted that the Supplement states the area should ‘generally be 5 km from the proposed development’ however ‘proponents may provide justification for analysing a smaller area’.
- Intermediate assessment of visual impacts for private viewpoints
- Intermediate and detailed assessment for public viewpoints.

3.2 Study areas

For the purposes of the assessment, two study areas have been defined for specific elements of this assessment. The details of these two study areas are outlined in sections 3.2.1 and 3.2.2.

3.2.1 Landscape assessment study area

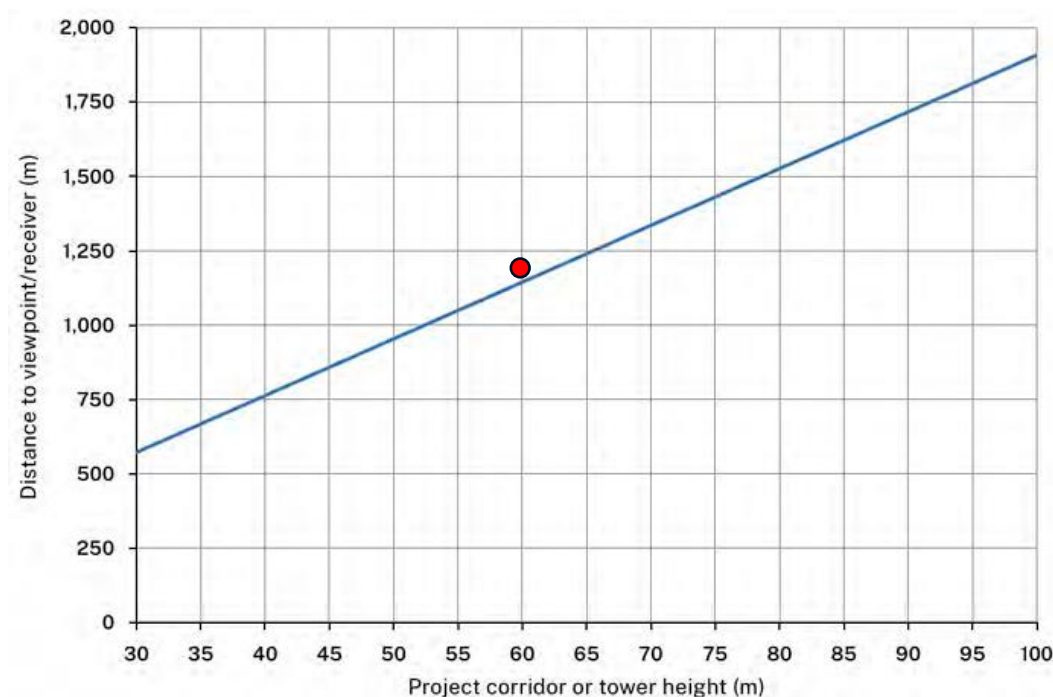
The landscape assessment study area encompasses the broader landscape context, including land use, topography, vegetation and settlement patterns and is utilised as part of the landscape character assessment and identification of landscape character zones.

A 2 km buffer has been identified for the project and is shown in Figure 3.2. A buffer of 2 km, compared to the generally recommended 5 km distance in the Supplement was considered appropriate to the context of the project due to the following:

- extension of the landscape assessment study area would not result in the introduction of any additional landscape character zones or other environmental factors not already considered in this assessment
- surrounding topography, presence of vegetation and areas not accessible to the public means that views are largely contained within the 2 km buffer

3.2.2 Visual assessment study area

The visual assessment study area is the area in which viewpoint selection, the Zone of Theoretical Visibility (ZTV) and the visual impact assessment are undertaken. The size of this study area is dictated by the maximum height of transmission structure (60 m) and the use of Figure 7 of the Supplement (Figure 3.1) which outlines the minimum extent of the study area based on the transmission structure height. For the project, the study area used for the assessment was 1,125 m from the project footprint as indicated by the red dot in Figure 3.1.



Source: DPHI, 2025

Figure 3.1 Extent of the scoping study area

3.3 Aerial Imagery used within this report

Aerial imagery used within this report has been sourced from NearMap under licence via a Web Service which is updated as imagery is updated. Imagery on figures is fed into GIS directly with the resolution of the imagery adjusted depending on the scale of the figure being generated.

Imagery used for figures is the most recently available from NearMap and is dated 22 September 2024.

3.4 Identification of viewpoints

In accordance with the Supplement, an analysis was undertaken to inform the selection of viewpoints for visual impact assessment. Viewpoints were initially identified based on the location of visual receivers within the defined visual assessment study area. This process considered both public and private receivers, consistent with guidance in the Technical Supplement.

Following the simple assessment stage (refer to section 3.7.3), viewpoints were refined in accordance with the proportionate assessment approach outlined in the Supplement. This refinement identified viewpoints where further assessment would be required to assess potential moderate or higher visual impacts (refer to section 6.2). If a private landowner would be affected by an easement they are not required to be assessed in accordance with the Supplement, however they will be eligible for compensation under the *Land Acquisition (Just Terms Compensation) Act 1991*. Transgrid has and will continue to consult with the landowner on the proposed impacts of the project.

3.5 Site inspections

Two separate site inspections were undertaken by two qualified Landscape Architects. The first site visit took place on 1 May 2024 between the hours of 9am and 3pm. The purpose of this site inspection was to:

- review the existing conditions and landscape character of the project footprint and study area
- review publicly accessible locations identified in the desktop study as likely to provide views of the project, including from roads, car parks, trails and other publicly accessible areas
- confirm sensitive visual receiver locations that were identified as part of the initial desktop assessment and conduct photography from these locations.

The second site inspection was undertaken on 28 January 2025 between the hours of 9am and 12pm to conduct panoramic photography from two visual receiver viewpoint locations (VP05 and VP06) identified in the simple assessment (refer to section 3.7.3) as having moderate or higher potential visual impacts. Access to VP06 was undertaken at the dwelling, while photography for VP05 was undertaken from the Duncan Street roads reserve as a worst case view from the collection of dwellings covered by this viewpoint.

3.6 Landscape character impact assessment

An assessment of the existing landscape was undertaken to form a baseline for the assessment. This includes determination of key landscape and spatial elements, features and values. The landscape assessment begins with the identification of landscape character zones. An assessment of landscape impact was then carried out by identifying the sensitivity of each landscape character area, describing the magnitude of change expected as a result of the project, and combining these factors to make an overall assessment of landscape impact.

The assessment is a desktop analysis and includes the use of aerial imagery, Geographic Information Systems (GIS) mapping and relevant legislation and policies presented in section 2. Analysis of the existing environment in section 4 identifies and describes the elements that comprise the landscape in the study area.

3.6.1 Landscape character

Landscape character, as described in the Supplement, “*is the distinct, recognisable and consistent pattern of elements in the landscape that make one landscape different from another*” (DPHI, 2025). This includes physical features of the existing environment, reviewed in section 4, and how all these features interact. It also includes human influences such as cultural and historic land uses and patterns that have shaped the landscape.

3.6.2 Landscape character baseline analysis

A baseline analysis was undertaken in accordance with section 2.1 of the Supplement to establish the existing landscape character and its sensitivity to change. This involved both desktop review and field observation to identify the defining features and values of the broader landscape.

The baseline analysis considered:

- physical characteristics, including landform, vegetation patterns, waterways, and land use
- human influences, such as settlement patterns, infrastructure, and land management
- aesthetic and perceptual aspects, including scale, openness, tranquillity, and coherence
- cultural and community values, identified through engagement with stakeholders and review of local planning instruments
- condition and intactness of the landscape, as well as any relevant planning or heritage designations.

The findings from the baseline analysis (refer to sections 4.1 to 4.5) informed the delineation of landscape character zones and provided the foundation for assessing the magnitude of change and the overall impact on landscape character.

3.6.3 Landscape character zone identification

To assess landscape impacts, landscape character zones (LCZs) are identified and mapped. LCZs divide the landscape based on common distinguishing visual characteristics including landforms and major land cover patterns. These patterns are formed by combinations of vegetation, water bodies, landforms and land use, from which the key landscape features can also be identified. Section 4.5.2 defines and describes each LCZ to:

- define landscape elements that contribute to defining character
- define landscape character attributes
- identify landscape value.

The assessment of the existing environment also considers factors which have influenced landscape change in the past and those that are likely to do so in the future.

When defining LCZs, the value attached to the landscape also forms the baseline for which the significance of the impact is measured. Landscape value looks at designated and undesignated landscapes and holistically at all the elements such as the environmental, cultural, historical, and visual/sensory elements that form the landscape. The value of the landscape from an international, national, local and community level is considered when applying a landscape value. The following factors are taken into consideration when defining landscape value:

- Landscape quality (physical state of the landscape)
- Scenic quality (appeal of the landscape to the senses)
- Rarity (presence of rare elements)
- Representativeness (distinct character or features of landscape)
- Conservation value
- Recreation value
- Perceptual aspects/qualities
- Associations (with particular people, artists, events in history).

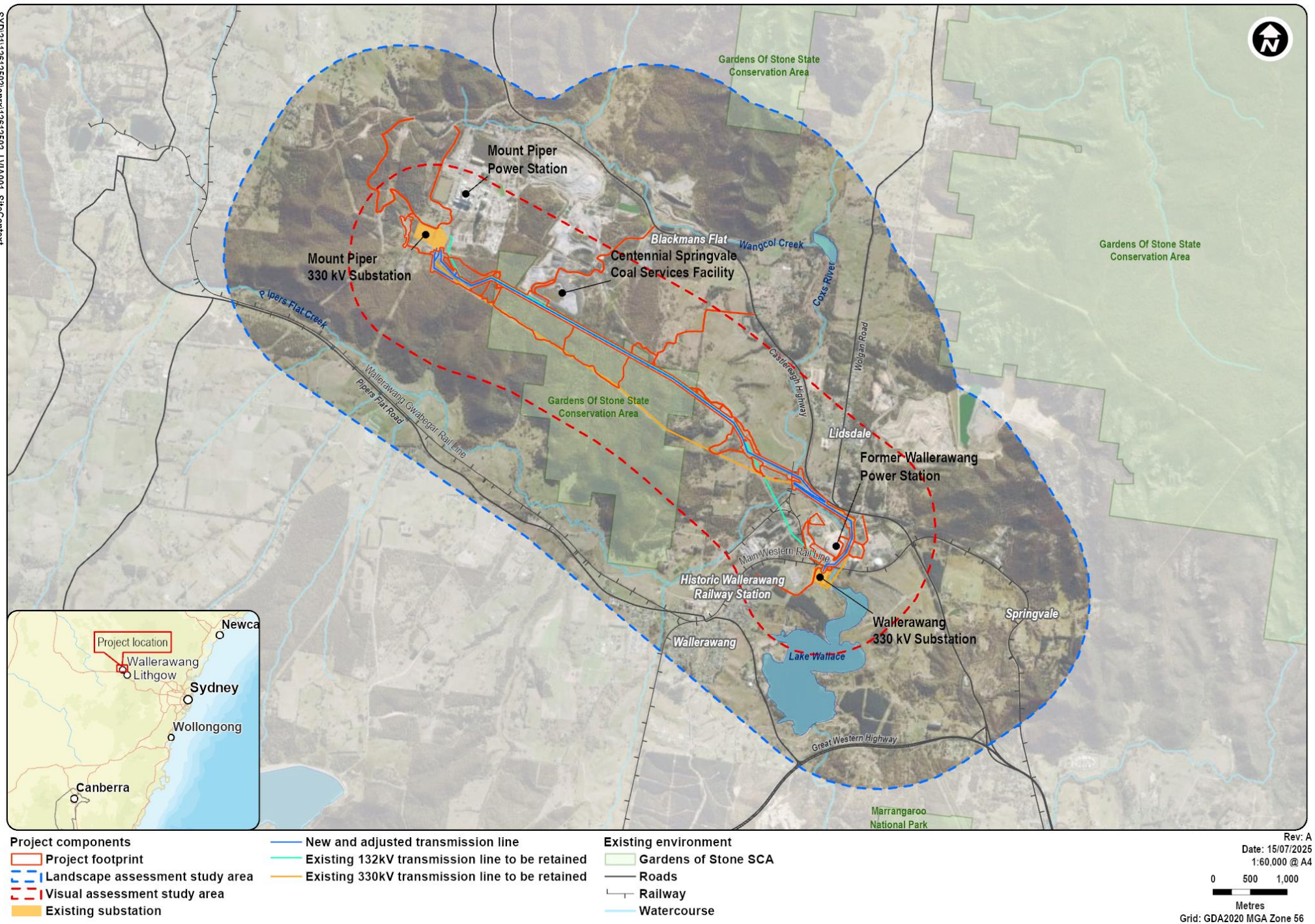


Figure 3.2 Study areas

3.6.4 Landscape character impacts

Assessment of landscape impacts deals with the effect of change and development on landscape as a resource. The concern is with how the project would affect the elements that make up the landscape, the aesthetic and perceptual aspects of the landscape and its distinctive character. The consideration of potential impacts on landscape character is determined based on the sensitivity of the existing landscape and the magnitude of change that is likely to occur.

A judgement is made on the overall level of significance of the landscape impact in relation to the existing conditions. The assessment criteria have been derived from the *Guidelines for Landscape and Visual Impact Assessment, 3rd Edition* (Landscape Institute and Environmental Management Assessment, 2013).

Sensitivity

Landscape sensitivity refers to the value placed on a landscape and its susceptibility to change. The sensitivity of a landscape may reflect the frequency and volume of users, as well as valued characteristics such as scenic amenity, its contribution to sense of place, and rarity. Additionally, sensitivity is shaped by relevant policies and guidelines, as outlined in section 2. A judgement on the level of sensitivity is made and a rating of high, moderate or low is applied. The following are guidelines used for the ratings:

- High Sensitivity
 - highly valued landscapes (e.g. national parks, AONBs, heritage landscapes)
 - distinctive character with strong sense of place
 - low capacity to absorb change due to intact features or minimal development
 - often protected by policy or designation.
- Moderate Sensitivity
 - landscapes of some value, possibly locally designated
 - mixed character with some development or alteration
 - moderate capacity to absorb change without major character loss.
- Low Sensitivity
 - heavily modified or degraded landscapes
 - limited scenic quality or sense of place
 - high capacity to absorb change due to existing infrastructure or urbanisation.

Magnitude

The magnitude of change to landscape character depends on the nature, scale and duration of the change expected to occur. The magnitude of change also depends on the loss, change or addition of any feature to the existing landscape. It is based on that part of the landscape character zone which is likely to be impacted to the greatest extent by the project.

Magnitude refers to the physical scale of the project which is assessed based on the following factors:

- Size and scale including:
 - The extent of existing landscape elements that may be lost and the contribution of that element to the character of the landscape.
 - The extent to which the project becomes a minor or major element in the landscape and its dominance in the visual catchment.
 - The extent to which the project changes the key characteristics of the landscape, which are critical to its distinctive character.
- Geographical area – the area of the landscape over which the effects will be experienced, having regard to the nature and scale of the project's effects. This could vary from the immediate setting of the site to larger scales where the project may influence several landscape characters units.
- Duration and reversibility of the effects on the landscape.

Each LCZ is assigned a magnitude rating (high, moderate or low). These ratings describe the extent of changes to the landscape's character due to the project development. Table 3.1 outlines the definitions on how the ratings are typically assigned.

Table 3.1 *Magnitude of change criteria (landscape)*

Rating	Criteria
High	A substantial/obvious change to the landscape character due to total loss of, or change to, elements, features or characteristics of the landscape. Would cause a landscape to be permanently changed and its quality diminished.
Moderate	Discernible changes in the landscape character due to partial loss of, or change to elements, features or characteristics of the landscape, however has potential to be partly mitigated. The change would be out of scale with the landscape character, and at odds with the local pattern and landform and would leave an adverse impact on the landscape character.
Low	Minor or no loss or alteration to one or more key landscape character elements, features or characteristics, or the introduction of components that may be new but may not be uncharacteristic within the existing landscape character.

The matrix shown in Table 3.2 is then used to determine the overall landscape character impact, based on the assigned sensitivity and magnitude ratings.

Table 3.2 *Landscape character impact rating matrix (Transport for New South Wales, 2023)*

		Magnitude		
		High	Moderate	Low
Sensitivity	High	High	High-moderate	Moderate
	Moderate	High-moderate	Moderate	Moderate-low
	Low	Moderate	Moderate-low	Low

3.7 Visual impact assessment

The visual impact assessment determines the day-to-day visual effects of a project on people's views from the private and public domain for both the construction and operational phases of a project. Assessment of visual impacts deals with the effects of change and development on a person's view and visual amenity.

3.7.1 Viewpoint selection

Visual receivers are identified based on their location within the study area and their potential for views of the project. Key considerations in selecting viewpoints include:

- proximity to the project, noting that closer receivers generally experience more significant visual change unless screened or at a lower elevation
- type of receiver, acknowledging that different land uses and viewer expectations (e.g. residential, road users, commercial) influence sensitivity to change.

Following analysis and field validation, viewpoints are selected for assessment. Each viewpoint represents either:

- a single private receiver, or
- a group of receivers in a geographically similar area with comparable visual context and project visibility.

The representative viewpoints are selected to reflect worst-case locations, including consideration of:

- local topography and vegetation
- the highest potential visibility of proposed transmission structures
- the most sensitive vantage point within each group.

In line with the Supplement, representative viewpoints have only been used to represent grouped dwellings, and not for views from the public domain except for public road viewpoints.

3.7.2 Zone of theoretical visibility

A Zone of Theoretical Visibility (ZTV) map is a computer-generated analysis using Geographical Information Systems (GIS) and satellite imagery to identify areas from which it is theoretically possible to view the project. The ZTV map considers landform only and does not consider buildings, trees or other intervening factors that may screen views of the project.

Initial investigations to determine the potential visibility of the project and establish viewpoints involved the preparation of a ZTV map during the scoping stage of the project, refer Appendix B. The map was initially utilised to determine visibility from visual receivers. The map has been updated as part of this LVIA in response to the latest design information and is shown in Figure 6.1.

3.7.3 Simple assessment

The Supplement prescribes an incremental visual impact assessment including Simple, Intermediate and Detailed assessments.

The simple assessment is the first stage and uses desktop analysis to eliminate the need for intermediate and detailed assessment of viewpoints that are likely to have low and very low impacts.

The following are considered in the simple assessment to provide initial ratings for each selected viewpoint:

- Determine visual sensitivity by identifying the viewpoint sensitivity and scenic quality at each viewpoint
- Determine the potential magnitude of impacts based on desktop analysis
- Determine the overall visual impact rating utilising the outcomes of the above steps.

Visual sensitivity

As outlined in the Supplement, visual sensitivity refers to the quality of the view and how sensitive it is to the proposed change. The visual sensitivity is determined by identifying the sensitivity of each viewpoint and categorising the scenic quality of the area within the view.

The below sections outline how visual sensitivity is determined in accordance with the Supplement.

Viewpoint sensitivity

Viewpoint sensitivity is determined using Table 3 in the Supplement (reproduced in Table 3.3 below) and is based on land zoning allocations at the viewpoint location and whether the view is a primary or secondary viewpoint. Primary views and residential land zoning allocations tend to have higher sensitivity ratings. The following is a summary of these two view types:

- Primary view – principal/frequented living spaces such as kitchens, living rooms and dining areas, front or rear views from a dwelling, particularly where there is a porch or balcony.
- Secondary view – less frequented living and service areas including bedrooms, laundries and bathrooms, side view from dwellings.

Each viewpoint is assigned a “Very low”, “Low”, “Moderate” or “High” sensitivity rating.

Table 3.3 Viewpoint sensitivity levels and examples

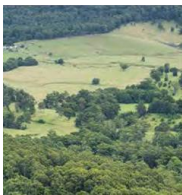
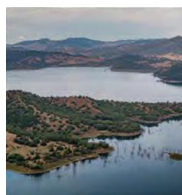
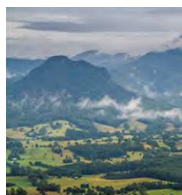
Viewpoint type	Very low viewpoint sensitivity	Low viewpoint sensitivity	Moderate viewpoint sensitivity	High viewpoint sensitivity
Private receiver	Not applicable	Secondary view from dwelling rural area (zoned RU1, RU2, RU3, RU4 and RU6), large lot residential areas (zoned R5) and environmental or conservation areas (zoned C2, C3 and C4) Primary views from dwellings in residential and rural villages (land zoned R1, R2, R3, R4 and RU5)	Primary view from dwellings in rural areas (zoned RU1, RU2, RU3, RU4 and RU6), large lot residential areas (zoned R5) and environmental or conservation areas (zoned C2, C3 and C4) Tourist and visitor accommodation (bed-and breakfasts, motels and hotels) and places of worship	Historic rural homesteads or residences on the national, state or local heritage list
Public viewpoint	State highways, freeways and classified main roads	Tourist roads and scenic drives Significant entry ways to regional towns and cities Cemeteries and memorial parks Publicly accessible green and open spaces, including picnic areas, parks, public recreation areas and lookouts Town centres and central business districts	Tourist uses in tourist areas (zoned SP3)	Not applicable

Source: Reproduced from DPHI, 2025

Scenic quality

Scenic quality is defined as the “holistic and relative scenic, cultural or aesthetic value of the landscape” and is based on the presence or absence of key landmarks or landscape features (DPHI, 2025). These landmarks or features may be identified in policy and guidelines, as outlined in section 2 of this report. Tables 5 and 6 in the Supplement (reproduced in Table 3.4) provide guidance for rating a view as having “Very Low”, “Low”, “Moderate” or a “High” scenic quality.

Table 3.4 Frame of reference and visual reference for scenic quality values

Viewpoint type	Very low scenic quality		Low scenic quality		Moderate scenic quality		High scenic quality	
Landform		Large expanses of flat or gently undulating terrain Indistinct, dissected or broken landforms that provide little illusion of spatial definition or landmarks with which to orient		Mostly flat or gently undulating terrain with isolated areas of undulating topography		Steep, hilly and undulating ranges that are not visually dominant Broad, shallow valleys Moderately deep gorges or moderately steep valley walls Minor rock outcrops		Isolated peaks, steep rocky ridges, cones or escarpments with distinctive form and colour contrast that become focal points Large areas of distinctive rock outcrops or boulders Well-defined, steep valley gorges
Vegetation		Extensively cleared and cropped areas with very limited variation in colour and texture Pastoral areas, human-created paddocks, pastures or grasslands and associated buildings typical of grazing lands		Predominantly cleared and cropped areas with small areas of variation in colour and texture Most pastures or grasslands with small blocks of distinct native vegetation		Predominantly open forest or woodland combined with some natural openings in patterns that offer some visual relief Vegetative stands ranging in size, form, colour, texture and spacing, including human-influenced vegetation (for example, vineyards, plantation forests and orchards)		Strongly defined natural patterns with combinations of native forest, naturally appearing openings, streamside vegetation and scattered exotics Distinctive stands of vegetation that may create unusual forms, colours or textures compared with surrounding vegetation
Waterbodies		Absence of natural waterbody Farm dams, irrigation canals or stormwater infrastructure		Minor water forms, such as creeks and streams		Intermittent streams, lakes, rivers, swamps and reservoirs		Visually prominent lakes, reservoirs, rivers, streams, wetlands and swamps Presence of harbour inlet, bay or open ocean
Social and cultural		Places of worship, cemeteries, memorial parks, private open spaces		Places of worship, cemeteries, memorial parks, private open spaces Local heritage sites		Local or state heritage sites Distinguishable entry ways to a regional city identified in the State Environmental Planning Policy (Transport and Infrastructure) 2021		Culturally important sites, wilderness, world heritage areas and protected areas World, national and state heritage sites
Human presence		Dominating presence of infrastructure, human settlements, highly modified landscapes and higher density populations, such as regional cities, industrial areas, agricultural transport or electricity infrastructure		Highly modified landscapes with visible infrastructure, such as transmission lines and railway corridors		Dispersed yet evident presence of human settlement, such as villages, small towns, isolated pockets of production and industry, lower scale and trafficked transport infrastructure		Natural, undisturbed landscape Minimal evidence of human presence and production

Source: Reproduced from Table 5 and 6 in DPPI, 2025

Overall visual sensitivity

The viewpoint sensitivity and scenic quality ratings (outlined in the above sections) are then combined to form an overall sensitivity rating using the matrix in Table 3.5 which is based on Table 7 in the Supplement.

Table 3.5 Visual sensitivity rating matrix

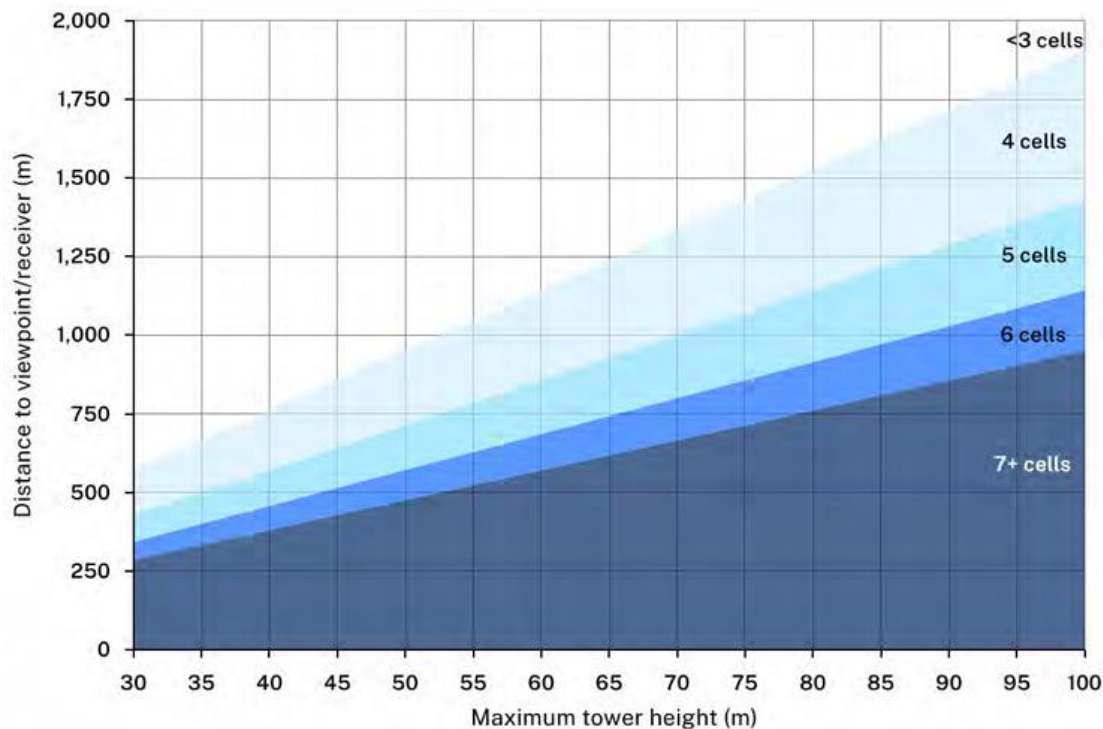
		Scenic quality			
		High	Moderate	Low	Very low
Viewpoint sensitivity	High	High	High	Moderate	Low
	Moderate	High	Moderate	Moderate	Low
	Low	Moderate	Low	Low	Very low
	Very low	Very low	Very low	Very low	Very low

Magnitude

As outlined in the Supplement, the simple assessment can rely on a theoretical calculation of the likely magnitude using simple parameters, including the height of the proposed transmission structures and distance of the nearest tower or corridor from each viewpoint.

To determine magnitude the following steps are followed:

- Determine the worst-case vertical field of view from each visual receiver in accordance with Figure 10 in the Supplement using the maximum height of transmission structures (60 m) and the distance of a receiver from the nearest transmission structure (refer Figure 3.3)
- Determine the potential magnitude threshold rating based on the vertical field of view (see dot point above) in accordance with Table 10 in the Supplement (refer Table 3.6).



Source: DPHI, 2025

Figure 3.3 Conservative vertical field of view

Table 3.6 Potential magnitude thresholds

Potential vertical cells of nearest tower	Potential magnitude
Less than 3 cells	Very low
4 cells	Low
5 cells	Moderate
6 cells	High
7 cells or more	Very high

Source: Reproduced from DPPI, 2025

Visual impact

The combination of sensitivity and magnitude determines the significance of the overall visual impact on the representative viewpoint. Table 3.7 is the matrix used to determine the significance of impact and is based on Table 8 in the Supplement.

Table 3.7 Visual impact rating matrix

		Visual sensitivity			
		High	Moderate	Low	Very low
Magnitude	Very high	High	High	Moderate	Moderate
	High	High	Moderate	Moderate	Low
	Moderate	Moderate	Moderate	Low	Low
	Low	Moderate	Low	Low	Very low
	Very low	Low	Low	Very low	Very low

3.7.4 Intermediate assessment

Where the simple assessment identifies viewpoints with moderate or higher impacts, in accordance with the Supplement, an intermediate and/or a detailed assessment is required. The intermediate assessment utilises wireframes of the project to determine the magnitude rating for any impacts. Where ratings from the intermediate assessment are moderate or high, a detailed assessment (refer to section 3.7.5) is required.

Intermediate assessments have not been undertaken as part of this LVIA and instead where further assessment was required, detailed assessments were undertaken as they were considered to be more informative in understanding the impacts on the visual receivers. This is consistent with the Supplement which outlines that proponents are able to skip the intermediate assessment if they choose.

3.7.5 Detailed assessment

The following steps are undertaken to determine the detailed visual impact assessment rating for operation:

- Refine the sensitivity ratings from the simple assessment through site visits and panoramic photomontages, considering specific attributes to individual views contributing to scenic quality and visual sensitivity.
- Refine magnitude rating to consider other forms of visual mitigation, including vegetation and built forms by:
 - Capturing panoramic photography from the viewpoint that comprises 180 degrees of horizontal field of view towards a project.
 - Superimpose a 3D rendered model and the magnitude grid tool on the panoramic photograph.
 - Verify whether any elements of the project would be obstructed by existing vegetation or built elements.
 - Determine the magnitude rating for each viewpoint based on the number of cells occupied within the magnitude grid tool and the thresholds in Table 2 of the Supplement. This magnitude rating replaces the potential magnitude identified in the simple assessment.

Construction

As the Supplement does not prescribe a method for calculating the construction magnitude rating, a qualitative assessment has been undertaken based on the method outlined below.

The magnitude of change to a viewpoint depends on the nature, scale and duration of the change expected to occur. The magnitude of change also depends on the loss, change or addition of any feature to the existing viewpoint. It is based on the most affected receivers being assessed as part of the viewpoint.

Magnitude refers to the physical scale of the project construction elements which is assessed based on the following factors:

- Size and scale of change including:
 - refers to how much of the view is affected and the degree of contrast introduced by the development
 - includes consideration of the extent of visibility, degree of obstruction, and introduction of new elements.
- Geographical extent – the area of the viewpoint over which the effects will be experienced which can range from a localized viewpoint to a wide panoramic landscape.
- Duration and reversibility – whether the change is temporary, long-term, or permanent.

Each viewpoint is assigned a magnitude rating (high, moderate or low). These ratings describe the extent of changes to the viewpoint due to the project development. Table 3.8 outlines the definitions on how the ratings are typically assigned as part of the visual assessment.

Table 3.8 *Magnitude of change criteria (visual impact)*

Rating	Criteria
High	A substantial/obvious change to the viewpoint due to total loss of, or change to, elements, features or characteristics of the viewpoint. Would cause a viewpoint to be permanently changed and its quality diminished.
Moderate	Discernible changes in the views due to partial loss of, or change to elements, features or characteristics of the viewpoint, however has potential to be partly mitigated. The change would be out of scale with the existing viewpoint, and at odds with the local pattern and landform and would leave an adverse impact on the viewpoint.
Low	Minor or no loss or alteration to one or more key viewpoint elements, features or characteristics, or the introduction of components that may be new but may not be uncharacteristic within the existing viewpoint.

The matrix shown in Table 3.2 is then used to determine the overall landscape character impact, based on the assigned sensitivity and magnitude ratings.

3.8 Cumulative impacts

Cumulative landscape and visual impacts result from further changes to the landscape or visual amenity caused by the proposed development in conjunction with other developments (associated with or separate to it) or actions that occurred in the past, present or are likely to occur in the foreseeable future (Landscape Institute et al, 2008).

Cumulative impact analysis involves identifying and assessing the combined effects of the proposed development with other existing or planned projects for both landscape and visual impacts. This helps to ensure a comprehensive understanding of how multiple developments collectively influence the landscape and visual environment.

It is important to evaluate whether or not the impact of other projects within the region would change the character by becoming the dominant visual element thereby transforming the discernment of the overall character.

The cumulative impact assessment involved:

- defining the area where the project and other existing or planned projects might have overlapping impacts
- identifying related projects including all existing, approved, and proposed developments that might contribute to cumulative impacts
- gathering baseline data on the current landscape and visual conditions through desktop research

- evaluating the landscape and visual impacts of the proposed development on its own, considering factors like landscape character, visual receivers, and key viewpoints
- assessing how the proposed development, combined with other identified projects, will impact the landscape
- determining the significance of cumulative impacts by considering the scale of change and the sensitivity of the affected landscape and visual receivers.

3.9 Night lighting and views from the air

There is no guidance provided in the Supplement for assessing night lighting however a general discussion of the potential impacts has been included in section 6.5 to address the SEARS.

Similarly, no guidance is provided in the Supplement for visual impacts from air traffic however a general discussion of the potential impacts from the air is described in Section 6.6. This considers views from the air generally rather than a representative viewpoint.

3.10 Panoramas and photomontages

Panoramas and photomontages reflect, as close as is reasonably possible, the likely effects of the project on the character of an area and on views from specific points. Their accuracy is critical to the assessment process and informed stakeholder engagement. The preparation of accurate visualisation involves the use of multiple processes. Creating panorama photographs is the first step and this process is described in Appendix D of the Supplement and outlined in Table 3.9.

Table 3.9 Requirements for capturing panorama photographs

Parameter	Requirement
Camera	– Full frame sensor – Camera positioned 1.5 m above the ground – Use of tripod (with levelling tools) and panoramic head
Lens	– 50 mm focal length – Aperture set to ensure all elements of the photograph are in focus
Composition	– Horizon positioned at the midpoint of the photographs – Multiple photographs taken every 15 degrees or at such frequency to provide adequate overlap (approximately 30%) between images
Location and conditions	– Where possible, photographs should be taken with no or minimal cloud cover and when the sun is high in the sky (generally from 9am to 3pm) – Clear skies should be superimposed over any imagery that would otherwise contain overcast skies
Merging photographs	– Photographs merged to achieve a panoramic photograph with horizontal field of view of 180 degrees – Merged panoramic photographs avoid distortion or warping of the individual images

Creating photomontages involves combining the photomontages with a digital terrain model of the surrounding landform and the 3D components of the project. The process used to prepare photomontages is as follows:

- GPS coordinates and details of the camera are recorded.
- A digital surface model (terrain, trees and buildings) is prepared using LiDAR data information.
- A “virtual” camera is positioned in the model using the photograph GPS data for each image.
- The digital surface model are used to align the view.
- The transmission structures, wires and associated infrastructure are then modelled in 3D and surface finishes assigned to the model.
- 3D modelled components were then incorporated into the photograph using the Adobe Photoshop program.

3.11 Mitigation and management measures

Mitigation measures are considered for any landscape character zones or viewpoints with moderate or higher impact ratings in the detailed assessment as outlined in the Supplement's performance objectives and mitigation requirements (DPHI, 2025). The impact is assessed against the performance objectives from the Supplement as outlined in Table 3.10.

Table 3.10 Visual performance objectives

Performance objectives	Level of impact
High visual impact	This level of impact should be avoided unless the proponent can justify that: – all reasonable efforts have been made to avoid the impact and alternative project designs are not feasible or would be unlikely to materially reduce the impact – all reasonable mitigation options have been considered – the proposed mitigation measures would effectively mitigate the impact and would not result in a significant obstruction of views.
Moderate visual impact	Public road viewpoints: – As far as is reasonable and feasible, the proponent should seek to reduce moderate visual impacts to road users. – Appropriate mitigation options include vegetation or other screening. Mitigation should only be considered if it would not obstruct important views and sight lines, could be confined to a relatively small area (i.e. vegetation screening would not be required for several hundred metres along a transport corridor) and where agreed with the relevant road authority. All other private receivers and public viewpoints: – Visual impact mitigation should be implemented within the project corridor and/or offered to the affected landowner and should be proportionate to the scale of impact. – There is no expectation this mitigation should eliminate the view of the development entirely, but it must reduce the impact to an acceptable level and not create unacceptable visual impacts to other receivers.
Low and very low visual impact	– No mitigation required.

4. Existing environment

Landscape features relevant to the project and considered in this LVIA include:

- landform, natural drainage, and other physical environmental features
- ecological characteristics and land cover including the spatial quality and condition of vegetation cover
- influence of human activity, including land use and built form
- key landscape features or attributes of the landscape associated with high visual interest or quality including natural, cultural or agricultural features
- the overall character and condition of the landscape including aesthetic qualities that contribute to its distinctive character (such as scale, complexity, or openness)
- aspects of the landscape that have important aboriginal cultural heritage value
- sensitive land use designations, zonings and heritage listings
- the location of any other proposed, operational or approved infrastructure within the area that may create direct or indirect cumulative impacts with the project.

4.1 Regional and local context

The project is located within the City of Lithgow Local Government Area (LGA), approximately 14 km north-west of the town of Lithgow in the Central West region of NSW (Figure 1.1).

The Central West is known for its attractions such as the Jenolan Caves, near Oberon, wineries, rural agricultural farmland and natural landscapes. The Greater Blue Mountains Area, a World Heritage listed Area, is located approximately 18 km east of the project footprint.

Major towns within the region include Bathurst, Orange, Mudgee, Lithgow, Parkes and Cowra. The town of Wallerawang is located approximately 1 km east of the southern portion of the project's footprint, while the village/urban area of Lidsdale is located approximately 300 m to the east of the project footprint, abutting Castlereagh Highway. The locality of Blackmans Flat is located around the north-western end of the project footprint however there is no urban area associated with this locality. Blackmans Flat includes vegetated areas and the Mount Piper Power Station and Centennial Coal Springvale Coal Services Facility.

The Mount Piper Power Station and Mount Piper 330 kV substation are located in the north-western part of the study area, referred to as the western end of the project. The former Wallerawang Power Station and Wallerawang 330 kV substation are located to the south-east at the eastern end of the project. Lake Wallace is located south of the eastern end of the project. Pipers Flat Creek is adjacent to Pipers Flat Road, directly south of the Gardens of Stone SCA and connects Thompsons Creek Reservoir with the Cocks River system above Lake Wallace.

The project is situated near coal mining operations and associated facilities such as the Centennial Springvale Coal Services Facility immediately east of the Mount Piper Power Station to the north of the project footprint. Two existing transmission line easements (TL94E and TL70/71) currently traverse the Gardens of Stone SCA.

The B55 Castlereagh Highway extends from the A32 Great Western Highway north and to the east of the project providing access to both ends of the project. Pipers Flat Road is a rural road providing a northwest connection from Main Street at Wallerawang, to Portland. Main Street provides a link between Wallerawang and the A32 Great Western Highway.

4.2 Topography

The topography within the study area (refer to Figure 4.1) consists of peaks associated with top of Mount Piper that form a relatively short ridgeline oriented in a north-west to south-east direction. The ridgeline falls sharply away to the south and west towards Pipers Flat Creek Reduced Level (RL) 900m and Lake Wallace (RL 870 m) and more gradually to the north and east towards Cocks River (RL 900m) and Wangcol Creek (RL 900m). The study area consists of steep, hilly terrain associated with the Gardens of Stone SCA immediately south-west of the project, and flatter, gently undulating rural land to the north-east and south around Lidsdale, Wallerawang and Pipers Flat Road.

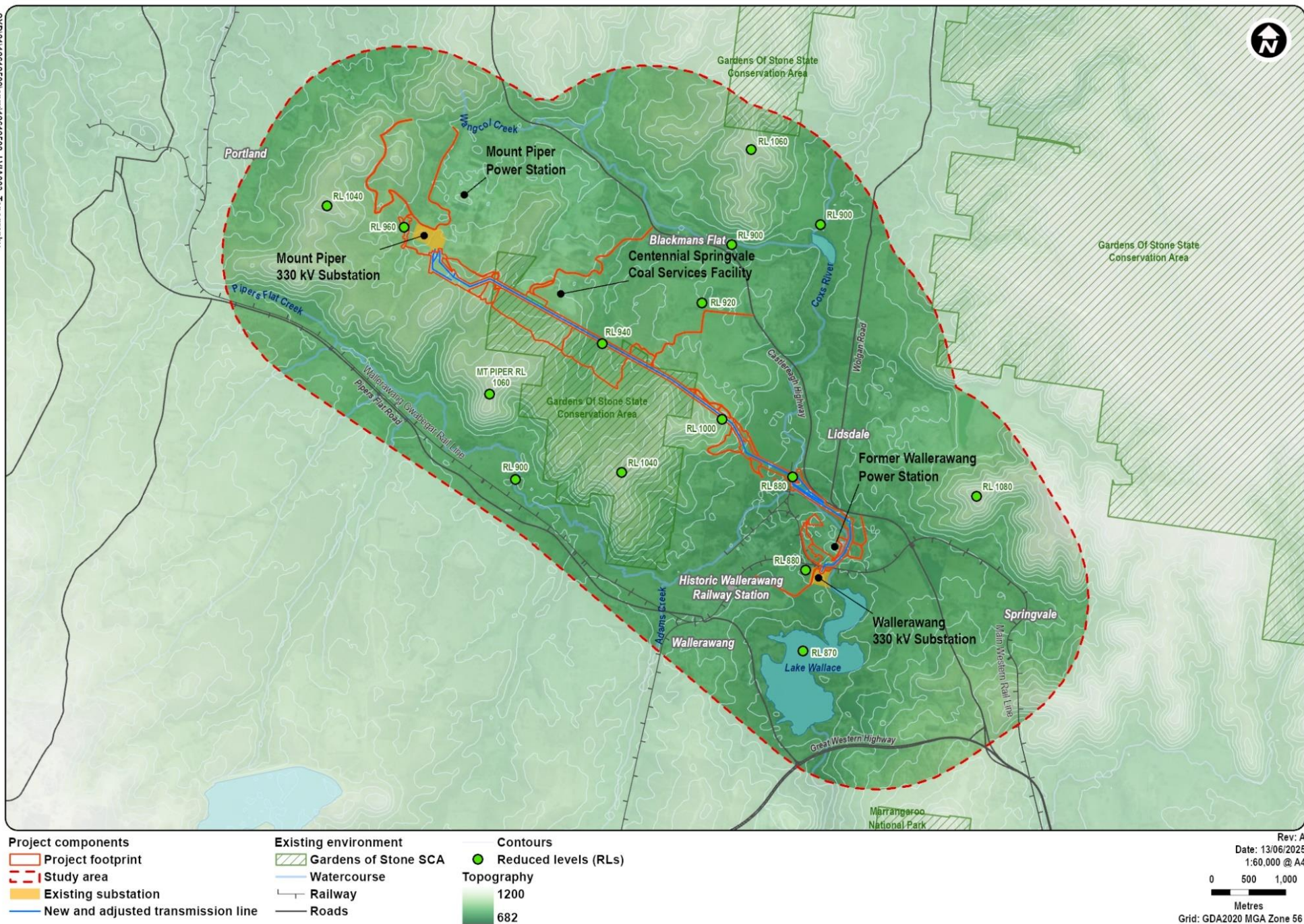
The RL range from the highest point at the peak of Mount Piper (RL 1060m) to the lowest point at Lake Wallace (RL 870m). The landform and elevation make the project more visible to visual receivers located in the Lidsdale urban area at the eastern end of the project. The landform also restricts visibility to receivers to the south of the project in the areas along Pipers Flat Road (about RL 900m).

The lowest RLs are predominately associated with the natural waterbodies within the study area including Cocks River, Pipers Flat Creek and Lake Wallace, while the highest RLs are associated with the hilly, forested terrain within the Gardens of Stone SCA. The project traverses this hilly terrain in the north-west and the flatter terrain to the south-east as it connects to the Wallerawang 330 kV substation.

Pipers Flat Road to the south of the project is located on generally flat terrain with open views to the north towards the bushland contained within the Gardens of Stone SCA. These views create scenic vistas towards natural bushland for motorists travelling both east and west along the road.

4.2.1 Scenic or significant vistas

Existing landforms in the study area provide the potential for wider views across the landscape from elevated positions. A review of scenic and significant vistas was undertaken as part of the desktop analysis and during field work. The review concluded that there are no scenic views or significant vistas occur within the study area. One of the reasons for this is the absence of designated, publicly accessible lookouts and, although there are distant, panoramic views of the landscape possible from dwellings in elevated positions (such as located along Wolgan Road and from Wolgan Road to the southwest), visual amenity in nearly all views throughout the study area is diminished from the presence of a large amount of electricity infrastructure. The result of industrial development throughout the study area has therefore had a negative adverse overall impact on the natural qualities and rural character of the landscape in the wider context.



4.3 Vegetation

The project is located within the South Eastern Highlands Bioregion and Capertee Uplands Subregion. The study area includes areas previously disturbed due to past development associated with mining, agricultural activities and residential subdivision development. Surrounding these disturbed areas of vegetation, there is scattered remnant vegetation and areas of natural bushland associated with the Gardens of Stone SCA and foothills of the Blue Mountains.

The Gardens of Stone SCA has several management strategies in place to protect the conservation area including strategies to manage weeds and pests, preserve landscape and geologies and preserve biodiversity. The portion of the SCA in the project footprint is accessible to the public, however no dedicated access points are provided and there is no visitor or tourist infrastructure. The Gardens of Stone State Conservation Area Masterplan (NPWS 2025) does not identify any current or future visitor infrastructure in the portion of the SCA within the project footprint.

There are no threatened ecological communities present in the identified Plant Community Types (PCTs) within the study area. The *Biodiversity Development Assessment Report* (GHD 2025) provides more information about PCTs and threatened species within proximity to the project.

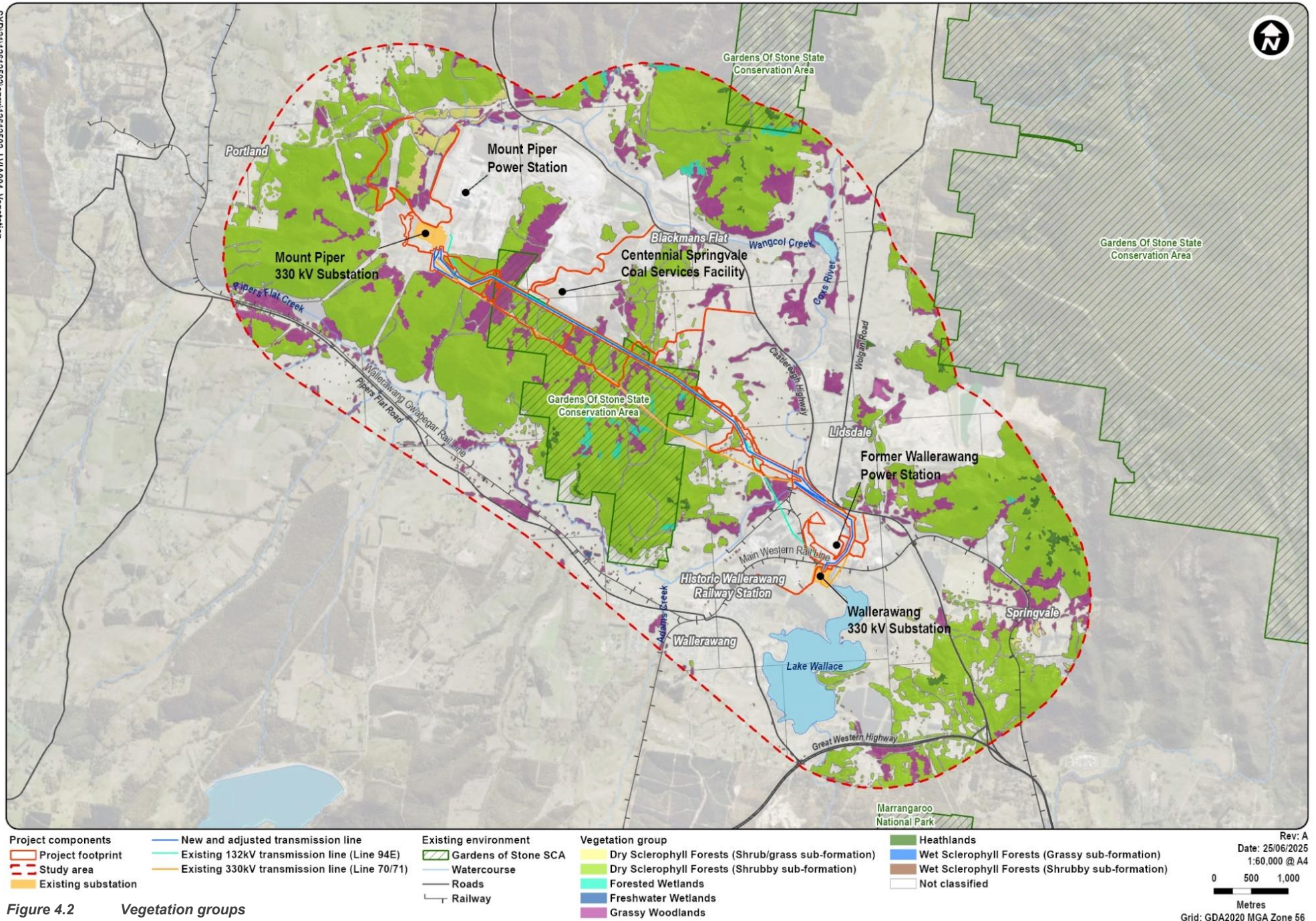
Figure 4.2 categorises the study area PCTs as part of their broad vegetation groups to demonstrate more general vegetation patterns in the landscape. Table 4.1 summarises the most prominent vegetation groups in the study area.

Table 4.1 *Vegetation groups*

Vegetation group	Location
Dry Sclerophyll Forests (Shrub/grass sub-formation)	Large patches of this sub-formation are located immediately west of the Mount Piper Power Station.
Dry Sclerophyll Forests (Shrubby sub-formation)	Dominant vegetation type in the study area, making up most of the Gardens of Stone SCA and covering most of the study area.
Grassy Woodlands	Interspersed amongst the Dry Sclerophyll Forests, with remnant patches also located north of the project around Wangcol Creek and Coxs River.
Forested Woodlands	Patches of Forested Woodlands are interspersed through the Gardens of Stone SCA around the centre of the study area.

Dry Sclerophyll Forests represent some of south-east Australia's last remaining areas of wilderness and are characterised by their biodiversity and scenic landscapes (Office of Environment & Heritage, n.d.). They are home to common native Australian species including eucalypts, wattles and banksias and low soil fertility makes the land unsuitable for agriculture, meaning the vegetation has remained mostly intact.

Grassy woodlands are the second most prominent vegetation type in the study area and are a widespread feature of rural Australia (Office of Environment & Heritage, n.d.). They generally comprise relatively open canopies with sparse shrubs and a diverse groundcover of tussock grasses. Patches of grassy woodlands are still present amongst the rural landscapes in the study area, particularly along waterways including Pipers Flat Creek, Coxs River and Wangcol Creek.



4.4 Land zoning

Land zoning designations within the study area, as identified in the Lithgow Local Environmental Plan (LEP) 2014, is shown in Figure 4.3. The project is predominately located within the Primary Production (RU1) and Forestry (RU3) zones. Primary Production (RU1) land is associated with large lot rural properties with potentially sensitive visual receivers where there are residential dwellings.

Parts of the existing transmission lines and proposed transmission lines are within the Gardens of Stone SCA. While this area is zoned as Forestry (RU3), the natural and cultural values associated with the SCA have been considered in assessing the landscape character and visual amenity of the bushland as it will generally remain forested. The Gardens of Stone SCA (within the project footprint) is publicly accessible, however areas in the vicinity of the project footprint are infrequently visited due to distance from public roads and that there are no designated recreational facilities within the project footprint and the wider portion of the SCA in which the project is located.

The Wallerawang and Mount Piper ends of the project footprint are zoned as infrastructure (SP2) where the project connects with the Wallerawang and Mount Piper 330 kV substations.

The town of Wallerawang is associated with both private and public residential and recreational land uses including low density residential (R2), large lot residential (R5), public and private recreation (RE1 & RE2) and a local centre (E1). The areas surrounding Wallerawang and Lidsdale also include general and heavy industry (E4 & E5) zones located near the former Wallerawang Power Station site and the Centennial Coal Lidsdale Siding.

4.5 Heritage

Heritage values are considered where they contribute to the landscape character or influence visual sensitivity (e.g. scenic or culturally significant landscapes). However, impacts to individual heritage items (Aboriginal or historic heritage) are assessed separately in Technical Report 5 – Aboriginal Cultural Heritage Assessment Report and Technical Report 6 – Historic Heritage Assessment and Statement of Heritage Impact Report. Impacts on cultural values for the project are outlined in the Cultural Values Assessment undertaken for the project by Transgrid (2024).

4.5.1 Aboriginal heritage and cultural values

The current project footprint lies within the easternmost lands traditionally occupied by the Wiradjuri people. Due to its location at the western base of the mountains, this area has often been regarded as a zone of interaction between the Wiradjuri, the Dharug to the east, and the Gundungurra to the south (Technical Report 5 – Aboriginal Cultural Heritage Assessment Report).

Cultural values have been identified through direct consultation with Aboriginal communities, in both the Cultural Values Assessment (Transgrid, 2024) and Technical Report 5 - Aboriginal Cultural Heritage Assessment Report. The Cocks River (Diuwan) was identified as part of both reports as being a culturally significant location within the project footprint. Technical Report 5 also identified four additional culturally significant locations in the surrounding area, and several Potential Archaeological Deposits within the project footprint.

Several artefacts and Aboriginal sites have been identified within the study area from the Aboriginal Heritage Information Management System (AHIMS) (Figure 4.4).

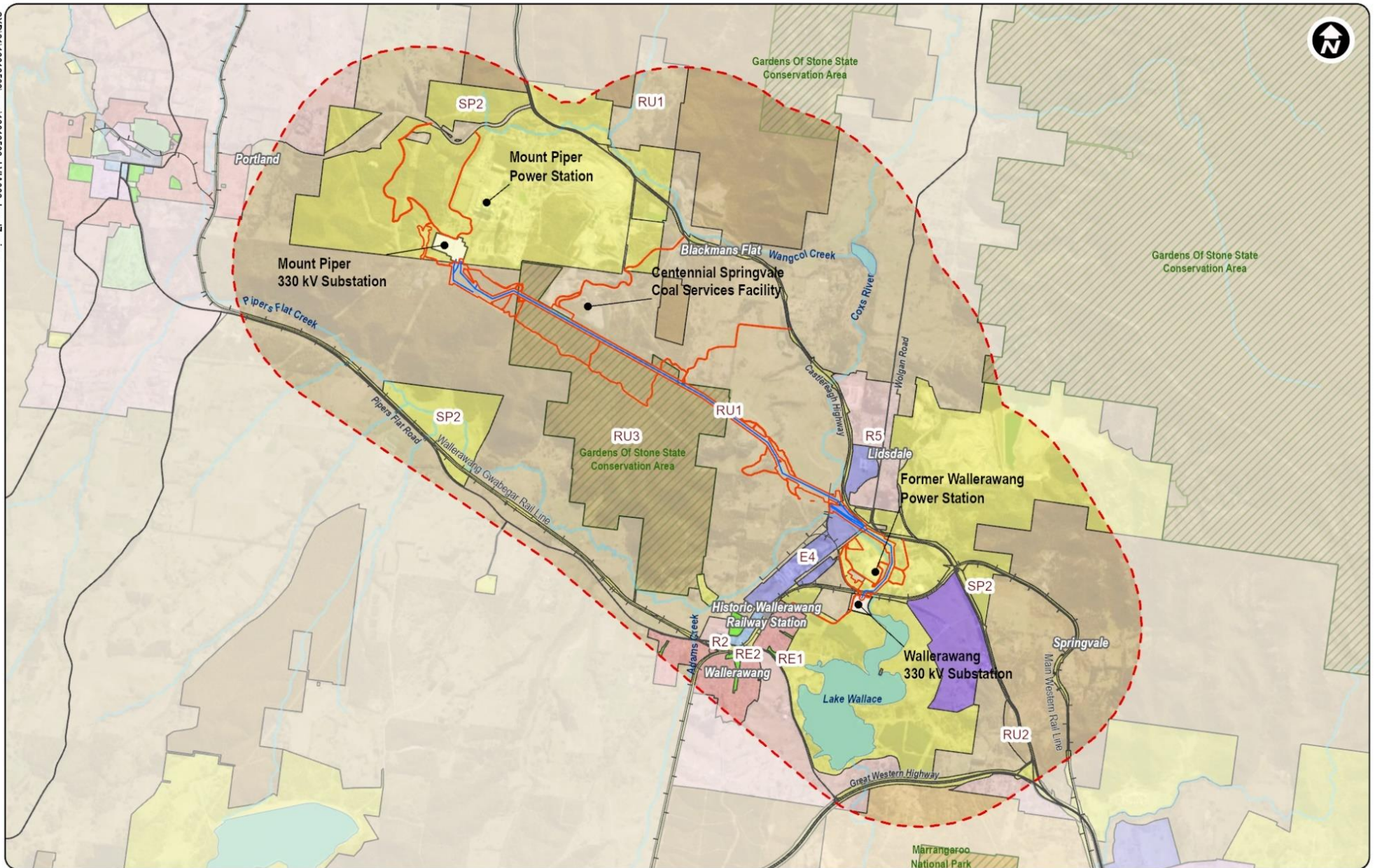
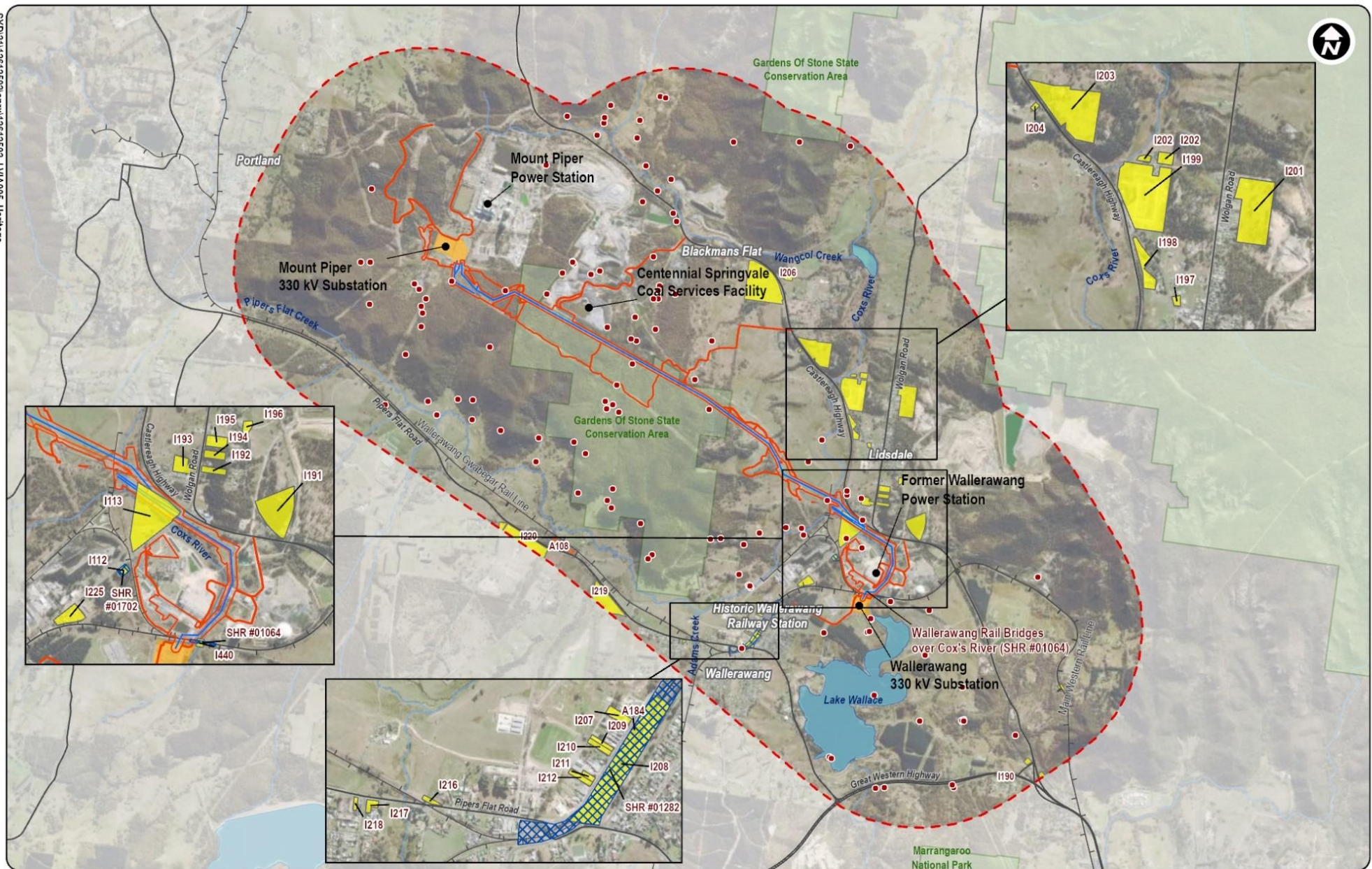


Figure 4.3 Land zoning

Rev: A
 Date: 13/06/2025
 1:60,000 @ A4
 0 500 1,000
 Metres
 Grid: GDA2020 MGA Zone 56



- | | | |
|---|--|---|
| Project components
Project footprint
Study area
Existing substation
New and adjusted transmission line | Existing environment
Gardens of Stone SCA
Watercourse
Railway
Roads | Heritage
LEP listed archaeological items
LEP listed heritage items
State Heritage Items
Aboriginal heritage items (AHIMS listed sites) |
|---|--|---|

Rev: A
 Date: 25/06/2025
 1:60,000 @ A4
 0 500 1,000
 Metres
 Grid: GDA2020 MGA Zone 56

Figure 4.4 Heritage items

4.5.2 Historic heritage

The Wallerawang region has a rich history of agricultural and industrial development. The township retains key elements of this history, with notable heritage items that reflect its past as an industrial and coal-mining centre dating from the mid-to-late 1800s, including the arrival of the railway and the discovery of coal (Sydney Morning Herald, 2008).

Twelve historic heritage items are located within 400 m of the project footprint, including both State and locally listed sites. Of these, the following five are considered to have the potential for views of the project:

- Wallerawang Rail Bridges over Cox's River (SHR #01064, also listed on the LEP and Country Rail Network Section 170 Register) – within the project footprint
- St John the Evangelist Church (SHR #01702, LEP #I112) – approximately 30 m west of the project footprint
- Old Wallerawang School House (LEP #I113) – curtilage within the project footprint, with the school house structure located about 150 m from the project footprint
- Lidsdale House (LEP #I203) – approximately 105 m east of the project footprint
- Wallerawang Gwabegar Rail Station and Yard Group (SHR #01282, also listed on the LEP #I208) – approximately 130 m south-west of the project footprint.

The location of these items is shown in Figure 4.3. Further detail is provided in Technical Report 6 – *Historic Heritage Assessment and Statement of Heritage Impact Report*.

Of the twelve historic heritage items within 400 m of the project footprint, the remaining seven are located at sufficient distance and/or have intervening vegetation or landform that limits the potential for views of the proposed transmission infrastructure.

Appendix C provides a list of all the heritage items shown in Figure 4.3, including those outside the 400 metre buffer of the project footprint.

4.6 Landscape character zones

Four LCZs were identified in the study area based on the built, natural and cultural features of the landscape identified in the analysis of the existing environment they include:

- LCZ1 – Forested hills
- LCZ2 – Agricultural lands
- LCZ3 – Industrial
- LCZ4 – Rural suburban development.

Figure 4.5 maps the extents of each LCZ identified within the study area. Descriptions of the LCZs are provided in sections 4.6.1 to 4.6.4.

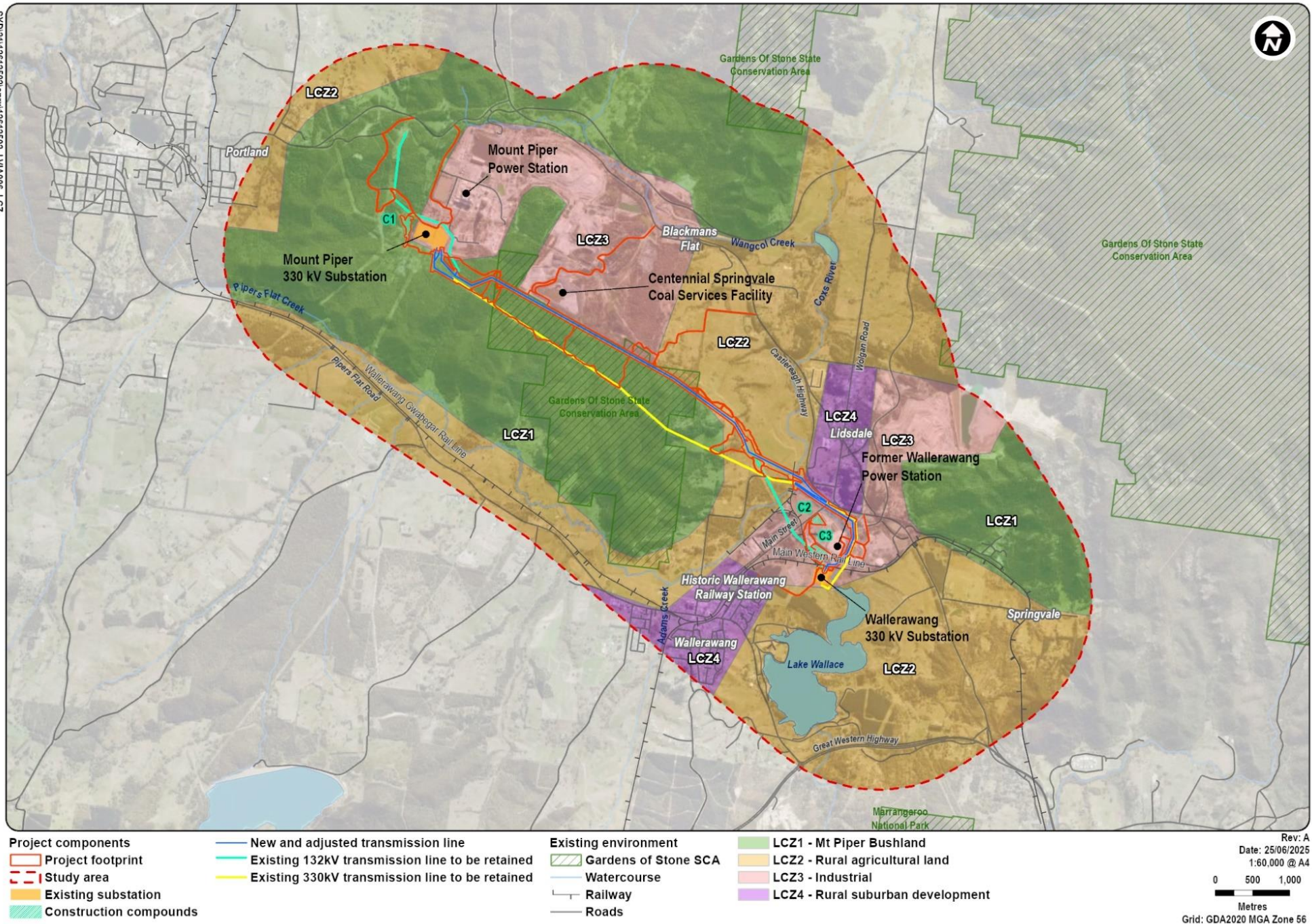


Figure 4.5 Landscape character zones

4.6.1 LCZ1 – Forested hills

LCZ1 comprises hilly, sometimes steep, forested terrain in the central and northern portions of the study area, predominately associated with the Gardens of Stone SCA, refer Figure 4.6. Cleared, existing transmission lines, transmission structures and easements traverse the LCZ through the Gardens of Stone SCA. Large areas of continuous bushland surround the Mount Piper Power Station and Mount Piper 330 kV substation to the south, west and north near Blackmans Flat.

Key characteristics of LCZ1 include:

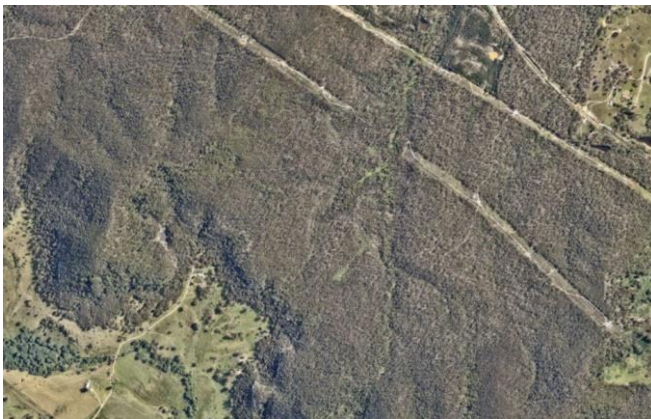
- dense vegetation on sloping terrain
- cleared corridors with existing transmission infrastructure
- coal mining operations infrastructure potentially visible and forms part of the overall bushland character
- access tracks and roads for maintenance and access to electrical infrastructure
- Mount Piper and its associated ridgeline oriented in a north-west to south-east direction.



Typical bushland character



View from entry road at Mount Piper Power Station



Aerial image of typical LCZ1 character (Source: Nearmaps)



View north from Pipers Flat Road

Figure 4.6 **LCZ1 character images**

4.6.2 LCZ2 – Agricultural lands

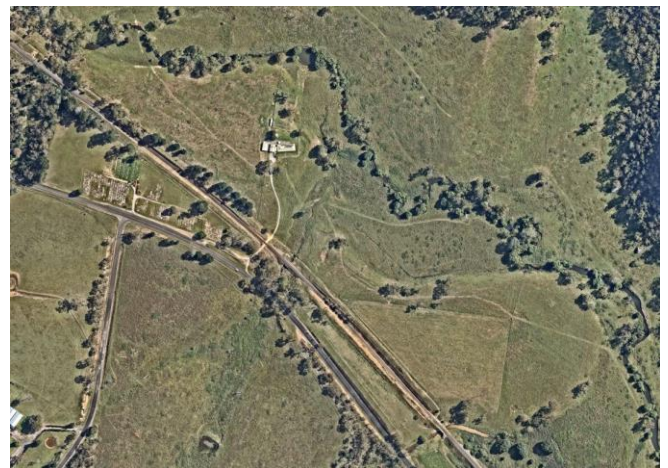
LCZ2 comprises flat and gently undulating rural lands with occasionally scattered residential dwellings on large, open, agricultural lots. This landscape aligns with agricultural areas which have been previously cleared of vegetation with these areas located along the project footprint and in surrounding areas as shown in Figure 4.7. This landscape also includes some cleared land located east of the former Wallerawang Power Station site.

Key characteristics of LCZ2 include:

- cleared, open landscape with predominantly agricultural land uses such as sheep and cattle grazing
- scattered remnant trees and vegetation following property boundaries, edges of major roads and creeks/riders
- a heritage feature: Lidsdale House
- waterways and water bodies such as Lake Wallace, Pipers Flat Creek, Wangcol Creek and Coks River with trees and vegetation growing intermittently along the edges of the waterways
- Coks River, identified as having Aboriginal cultural value
- presence of rural fencing
- occasional large lot residential dwellings and farm infrastructure such as outbuildings, barns, sheds and farm machinery
- transmission lines and transmission structures
- sealed and unsealed local roads with associated infrastructure including signage and safety barriers including the Castlereagh Highway (B55) and Wolgan Road to the north and east, and Pipers Flat Road to the south
- open views across cleared land of neighbouring agricultural properties and bushland in the background.



View south-west from property on Wolgan Road, Lidsdale



Aerial image of typical LCZ2 character (Source: Nearmaps)



View north-east towards rural property on View Street, Lidsdale

Figure 4.7 LCZ2 character images

4.6.3 LCZ3 – Industrial

LCZ3 comprises industrial facilities and sites such as power stations and electrical substations, open cut mines, and other major infrastructure. Infrastructure is common across the LCZ and is a key characteristic of the Wallerawang and Mount Piper area, refer Figure 4.8. The largest area of industrial land associated with LCZ3 is the Mount Piper Power Station and the Centennial Springvale Coal Services Facility in the north-west of the study area, and the Wallerawang 330 kV substation and former Wallerawang Power Station at the eastern end of the study area.

Key characteristics of LCZ3 include:

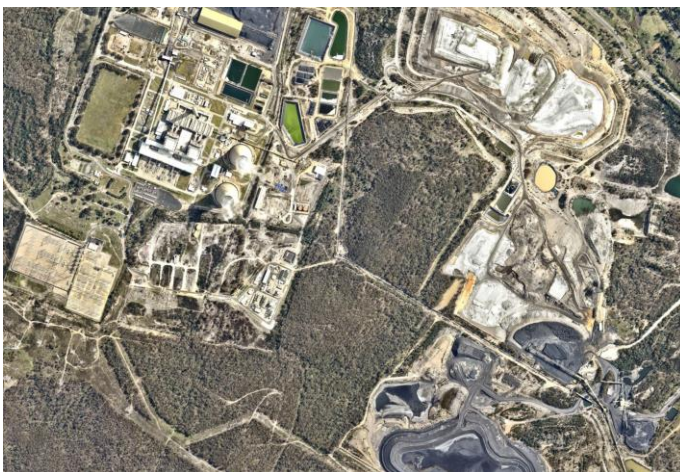
- Cleared sites with pockets of vegetation, typically remnant as well as planted exotics.
- Coal stockpiles associated with the conveyor at Lidsdale Siding, Centennial Springvale Coal Services Facility and Mount Piper Power Station.
- Heritage features in Wallerawang including the Old Wallerawang School House, the Church of St John the Evangelist, and the Wallerawang Rail Bridges over Coxs River.
- Coxs River, identified as having Aboriginal cultural value.
- Large-scale infrastructure including the Centennial Springvale Coal Services Facility, overland coal conveyors, transmission structures and transmission lines, substations, power stations, rail lines and coal reject emplacement areas. Other infrastructure associated with these include multistorey, functional, typically windowless ancillary buildings, gantries, fencing and lighting for security.
- Sealed roads and carparks providing large vehicle access to industrial sites. Main roads include the Castlereagh Highway (B55) that borders the LCZ to the north.
- Steel lattice towers or wood pole structures, cooling towers and ponds associated with Mount Piper Power Station, Mount Piper 330 kV substation and the former Wallerawang Power Station.



View south-east from Wolgan Road at Castlereagh Highway



Mount Piper Power Station



Aerial image of typical LCZ3 character (Source: Nearmaps)



Mount Piper 330 kV Substation

Figure 4.8 LCZ3 character images

4.6.4 LCZ4 – Rural suburban development

LCZ4 comprises low density suburban development typically residential dwellings and the small-scale commercial areas associated with the township of Wallerawang on Main Street, refer Figure 4.9. A cluster of residential dwellings on Wolgan Road and neighbouring local streets form part of the suburb of Lidsdale.

Key characteristics of LCZ4 include:

- development consisting of one and two-storey residential suburban dwellings and commercial village buildings located on Main Street within the township of Wallerawang
- turfed verge areas with power poles, street lighting, overhead wires and occasional street trees and/or shrub planting
- sealed roads, driveways, concrete kerb and gutter. Main roads associated with LCZ4 include Main Street in Wallerawang and Wolgan Road in Lidsdale
- mixture of property boundary treatments including low picket-style fences, wire mesh, colourbond or open
- heritage listed buildings and sites such as the Wallerawang Gwabegar Junction Rail Station (I208) and the historical Post Office (I211) are located within the township of Wallerawang.



View west on Duncan Street



View north-west on Pindari Place, Wallerawang



Aerial image of typical LCZ4 character (Source: Nearmaps)



View south-west on Main Street, Wallerawang

Figure 4.9 LCZ4 character images

4.7 Community and stakeholder engagement

Transgrid is leading community engagement for the project and this has involved ongoing, targeted consultation with potentially affected landowners and stakeholders throughout the route selection, design and environmental assessment phases. This has included regular monthly meetings with landowners, letter box drops, and direct discussions with landowners located near the project. These activities provided multiple opportunities for community members to provide feedback and raise concerns, including those relating to visual amenity and landscape character.

A key outcome of this engagement was the clear preference from the community for a route that minimised impacts to private landowners and visual impacts. This feedback informed the route selection process and the selection of a route that avoids visually sensitive properties where practicable and limits the overall extent of visual impacts.

Community values, including sensitivity to visual change and preferences for preserving rural and vegetated landscapes, have been considered in the visual impact assessment. This has been reflected in the assignment of viewpoint sensitivity and scenic quality ratings, particularly in areas where residential and community use is closely tied to appreciation of the landscape setting.

Community consultation also informed the approach to visual mitigation (section 8), specifically the need for screening, vegetation retention and visual buffers in areas identified as having higher sensitivity.

Transgrid has engaged with the relevant residents of Duncan Street and Brays Lane with no feedback received to date. This engagement and consultation will continue and be ongoing during detailed design and construction.

5. Landscape character assessment

5.1 LCZ1 – Forested hills

Table 5.1 describes the anticipated changes and provides an assessment of the landscape character impacts based on sensitivity and magnitude to determine an overall landscape character impact rating for LCZ1.

Table 5.1 LCZ1 impact assessment

Existing sensitivity of LCZ	Moderate - Natural values are associated with forested areas around the Mount Piper 330 kV substation and the Gardens of Stone SCA. - The portion of the SCA within the project footprint is isolated from the majority of the SCA, without any dedicated access points or recreation facilities. <i>The Gardens of Stone State Conservation Area Masterplan</i> produced in 2025 did not identify any visitor activities within the portion of the SCA within the project footprint. - LCZ1 provides important vegetation that contrasts with an otherwise predominantly cleared, modified, rural landscape. - The landscape has been modified from its original forested state with the presence of existing transmission infrastructure and easements, reducing the sensitivity rating to moderate.
Construction	
Anticipated impacts to landscape character	- Clearance of vegetation associated with the widening of the existing 45 m easement to 60 m in the Gardens of Stone SCA to accommodate the new 330 kV transmission line, as well as clearance for some additional areas required for construction elements such as the construction compound 1 near the Mount Piper 330 kV substation and access tracks. - Construction works within LCZ1 would include the removal of existing transmission structures, site establishment works, earthworks, construction of footings and foundations and assembly of new transmission structures. A construction compound is located immediately west of the Mount Piper 330kV Substation. - Temporary site fencing and signage may be required along with the use of construction equipment and machinery such as excavators, bulldozers, graders and mobile cranes.
Magnitude of the change	Low - Site establishment including clearance of vegetation, construction compound establishment, access track construction and upgrade. - Earthworks and establishment of construction benches and brake and winch sites for each transmission structure. - Assembly and erection of new transmission structures and stringing of conductors - The proximity of the construction compound to the Mount Piper substation would minimise the overall impact of change to the LCZ. - Works are temporary and would take approximately ten (10) months to complete from site establishment through assembly of structures.
Overall landscape character impact	Moderate-low
Operation	
Anticipated impact to landscape character	Introduction of new taller transmission structures with a maximum height of 60 m replacing existing transmission line poles which are currently a maximum height of approximately 19 m within LCZ1.
Magnitude of the change	Low The proposed changes will result in generally minor changes to the LCZ as the project replaces the existing 132 kV wood pole structures with new, larger, 330 kV steel lattice structures in the existing easement otherwise the LCZ will undergo little change.
Overall landscape character impact	Moderate-low

5.2 LCZ2 – Agricultural lands

Table 5.2 describes the anticipated changes and provides an assessment of the landscape character impacts based on sensitivity and magnitude to determine an overall landscape character impact rating for LCZ2.

Table 5.2 LCZ2 impact assessment

Existing sensitivity of LCZ	Low - LCZ2 comprises a cleared, rural landscape that accommodates agricultural and industrial activities. The presence of existing transmission lines, rail lines, roads and overland coal conveyors form part of the existing overall character and therefore the LCZ has large capacity to absorb the introduction of new transmission infrastructure. - The rural, agricultural landscape character is valued by local communities and contributes to the region's landscape scenic values. This includes the Aboriginal cultural value of the Coss River. However the rating is reduced to low due to it containing infrastructure for power, road and rail.
Construction	
Anticipated impacts to landscape character	- Potential for some vegetation removal associated with the widening of the existing 45 m easement to 60 m to accommodate the new 330 kV transmission line. - Upgrade of access tracks and the construction of a number of new tracks to provide access to transmission structure locations not currently serviced by existing tracks. The new tracks include a new permanent box culvert crossing across an unnamed waterway just north of Brays Lane. - Construction works within LCZ2 include the removal of existing transmission structures, site establishment works, earthworks, construction of footings and foundations and assembly of new transmission structures. - Temporary site fencing and signage may be required along with the use of construction equipment and machinery such as excavators, bulldozers, graders and mobile cranes.
Magnitude of the change	Low - Limited amount of vegetation and tree removal as part of the easement widening. - Site establishment including clearance of vegetation, construction compound establishment, access track construction and upgrade. - Earthworks and establishment of construction benches and brake and winch sites for each transmission structure. - Assembly and erection of new transmission structures and stringing of conductors - Works are temporary and would take approximately ten (10) months to complete from site establishment through assembly of structures.
Overall landscape character impact	Low
Operation	
Anticipated impacts to landscape character	Introduction of new transmission structures with a maximum height of 60 m on and adjacent to an existing easement. Some of these new transmission structures are located along a new alignment while others will replace existing TL94E pole structures within LCZ2 whose maximum height is approximately 18 m.
Magnitude of the change	Low - The proposed changes will result in generally minor changes to the LCZ as the project replaces the existing transmission structures with new, larger, 330 kV steel lattice towers in the existing easement otherwise the LCZ will undergo little change. - New transmission infrastructure located near an existing easement with 330 kV transmission tower infrastructure. - The proposed changes are located in a relatively small area and would not disrupt any key landscape features.
Overall landscape character impact	Low

5.3 LCZ3 – Industrial

Table 5.3 describes the anticipated changes and provides an assessment of the landscape character impacts based on sensitivity and magnitude to determine an overall landscape character impact rating for LCZ3.

Table 5.3 LCZ3 impact assessment

Existing sensitivity of LCZ	Low - LCZ3 is a highly modified landscape with existing large scale industrial infrastructure including substations, power stations (including parts of the former Wallerawang Power Station site), transmission lines and infrastructure associated with the Centennial Springvale Coal Services Facility. - LCZ3 has a very low scenic and landscape quality due to existing heavy industrial presence and therefore has a high capacity to absorb the introduction of new transmission infrastructure. While the Coks River has Aboriginal cultural value, the area surrounding the river in this LCZ is already a highly modified landscape. - Three heritage items exist in LCZ3 that are located within 100 m of the project including the Wallerawang Rail Bridges over Coks River (I1064), St John the Evangelist Church (I112) and the Old Wallerawang School House (I113) however all items are relatively discreet elements in the broader, industrial LCZ context.
Construction	
Anticipated impacts to landscape character	- Construction works within LCZ3 include the removal of existing transmission structures, site establishment works, earthworks, construction of footings and foundations and assembly of new transmission structures. - Two construction compounds are located within the former Wallerawang Power Station. - Access road upgrades with some associated vegetation clearing may be required near Mount Piper Power Station and at the eastern end of the project. - Temporary site fencing and signage may be required along with the use of construction equipment and machinery such as excavators, bulldozers, graders and mobile cranes.
Magnitude of the change	Low - Site establishment including minor clearance of vegetation, construction compound establishment, access track construction and upgrade. - The two construction compounds are located within the Wallerawang Power Station area and generally congruous with the developed, industrial character of the LCZ. - Earthworks and establishment of construction benches and brake and winch sites for each transmission structure. - Assembly and erection of new transmission structures and stringing of conductors - Works are temporary and would take approximately ten (10) months to complete from site establishment through assembly of structures.
Overall landscape character impact	Low
Operation	
Anticipated impacts to landscape character	- Anticipated changes to LCZ3 at the eastern end of the project include the introduction of new transmission structures with a maximum height of 60 m. - No proposed works at the western end of the project apart from the use of an existing access road through the Mount Piper Power Station. - Some new and upgraded access tracks would remain operational throughout the LCZ.
Magnitude of the change	Low - New and adjusted transmission infrastructure proposed within this LCZ would generally be additional to those already in the landscape and they would be of a similar scale and type as the existing 330 kV infrastructure. - The proposed changes would not disrupt any key landscape features.
Overall landscape character impact	Low

5.4 LCZ4 – Rural suburban development

Table 5.4 describes the anticipated changes and provides an assessment of the landscape character impacts based on sensitivity and magnitude to determine an overall landscape character impact rating for LCZ4.

Table 5.4 LCZ4 impact assessment

Existing sensitivity of LCZ	Moderate – The LCZ4 is a semi-urban landscape including the presence of roads, dwellings, streets and associated residential infrastructure. – Historical sites in Wallerawang such as the Wallerawang Junction Railway Station (I208) and the historical Post Office (I211) contain important local heritage features that contribute to cultural heritage qualities.
Construction	
Anticipated impacts to landscape character	– No construction impacts are anticipated as the project is located outside of LCZ4. – Some construction traffic may use the B55 Castlereagh Highway for project access which interacts with the LCZ south of Lidsdale.
Magnitude of change	Low – There are no direct impacts as the project footprint is located outside of LCZ4. – Indirect impacts may include visible construction traffic utilising Castlereagh Highway and local roads, Barton Avenue, Cripps Avenue and Heel Street in Wallerawang or glimpses of the assembly and erection of new transmission structures and stringing of conductors.
Overall landscape character impact	Construction – Moderate-low
Operation	
Anticipated change to landscape character	– Minor anticipated impacts as the project footprint is located outside of LCZ4. Transmission structure introduce new forms and materials thereby indirectly impacting the adjacent LCZ and altering their perceived character.
Magnitude of change	Low – There is new infrastructure located in the adjacent LCZ3 however it would not directly impact the landscape character in LCZ4. The presence of new transmission tower infrastructure, located about 100 m away, may create indirect visual impacts on the LCZ.
Overall landscape character impact	Moderate-low

6. Visual impact assessment

6.1 Viewshed analysis

The ZTV plan prepared as part of the scoping stage was updated as part of this LVIA to help determine visibility of the project within the study area based on the current project design and as part of the viewshed analysis, refer Figure 6.1. The ZTV indicates potential visibility across much of the study area, primarily due to the location of transmission tower infrastructure on elevated landforms compared with the surrounding landscape.

A total of approximately 278 public and private receiver locations were identified within the study area as having potential views of the project, the majority of which are dwellings concentrated in the southern part of the Lidsdale urban area and in the north-eastern area of the Wallerawang urban area. The location of all receivers within the visual impact assessment area are shown in Appendix D.

Nine (9) public receiver locations were identified in the study area primarily associated with local roads, the B55 Castlereagh Highway, parks, a cemetery and open spaces and the Wallerawang Main Street commercial area.

Based on the ZTV and desktop analysis, field work was then undertaken to review and confirm visibility from areas identified with potential views thereby informing the selection of the representative viewpoints.

6.2 Results of the simple assessment

From the viewshed analysis and site inspection, it was determined that eight private viewpoints were to be assessed in the simple assessment. Viewpoint locations were selected to represent either a single visual receiver location or receivers located within a relatively small geographic area with similar potential visual impacts. The locations of these viewpoints are shown in Figure 6.1.

The number of receivers considered for each viewpoint is outlined in Table 6.1. Viewpoint sensitivity and scenic quality were informed by desktop analysis and magnitude ratings were calculated based on vertical field of view and a maximum transmission structure height of 60 m (utilising Figure 3.3). Table 6.1 outlines the simple assessment results using the methods outlined in section 3.7.3.

Table 6.1 Simple assessment ratings

Viewpoints	Number of receiver considered	Viewpoint sensitivity	Scenic Quality	Visual sensitivity	Distance to nearest transmission structure	Vertical field of view (No. of cells)	Magnitude of change	Visual impact rating	Requires detailed assessment?
Private viewpoints									
VP01	1	Moderate	Low	Moderate	340 m	7+	Very High	High	Yes
VP02	4	Moderate	Low	Moderate	1105 m	<3	Very Low	Low	No
VP03	2	Moderate	Low	Moderate	1090 m	4	Low	Low	No
VP04	72	Moderate	Low	Moderate	675 m	6	High	Moderate	Yes
VP05	31	Moderate	Very Low	Low	125 m	7+	Very High	Moderate	Yes
VP06	3	Moderate	Low	Low	330 m	7+	Very High	Moderate	Yes
VP07	30	Moderate	Very Low	Low	815 m	5	Moderate	Low	No
VP08	134	Moderate	Low	Moderate	860 m	4	Low	Low	No

Viewpoints	Number of receiver considered	Viewpoint sensitivity	Scenic Quality	Visual sensitivity	Distance to nearest transmission structure	Vertical field of view (No. of cells)	Magnitude of change	Visual impact rating	Requires detailed assessment?
Public viewpoints – road corridors									
VP09	varies	Very low	Very low	Very low	90 m	7+	Very high	Moderate	Yes
VP10	varies	Very low	Very low	Very low	900 m	4	Low	Very low	No
VP11	varies	Very low	Very low	Very low	650 m	6	High	Low	No
VP12	varies	Very low	Very low	Very low	200 m	7+	Very high	Moderate	Yes
VP13	varies	Low	Low	Low	600 m	6	High	Low	No
Public viewpoints – public places									
VP14	varies	Low	Very low	Very low	650 m	6	High	Low	No
VP15	varies	Low	Very low	Very low	1000 m	4	Low	Very low	No
VP16	varies	Low	Very low	Very low	900 m	4	Low	Very low	No
VP17	varies	Low	Very low	Very low	1,100 m	4	Low	Very low	No

6.3 Detailed viewpoint assessment

Based on the simple assessment, the following four (4) private viewpoints were identified as requiring a detailed visual impact assessment: VP01, VP04, VP05 and VP06. Two viewpoints (VP05 and VP06) were carried through for detailed assessment as outlined in section 6.3.1, while two viewpoints (VP01 and VP04) were not considered in the detailed assessment due to the reasons outlined in section 6.3.2.

6.3.1 Viewpoints considered in detailed assessment

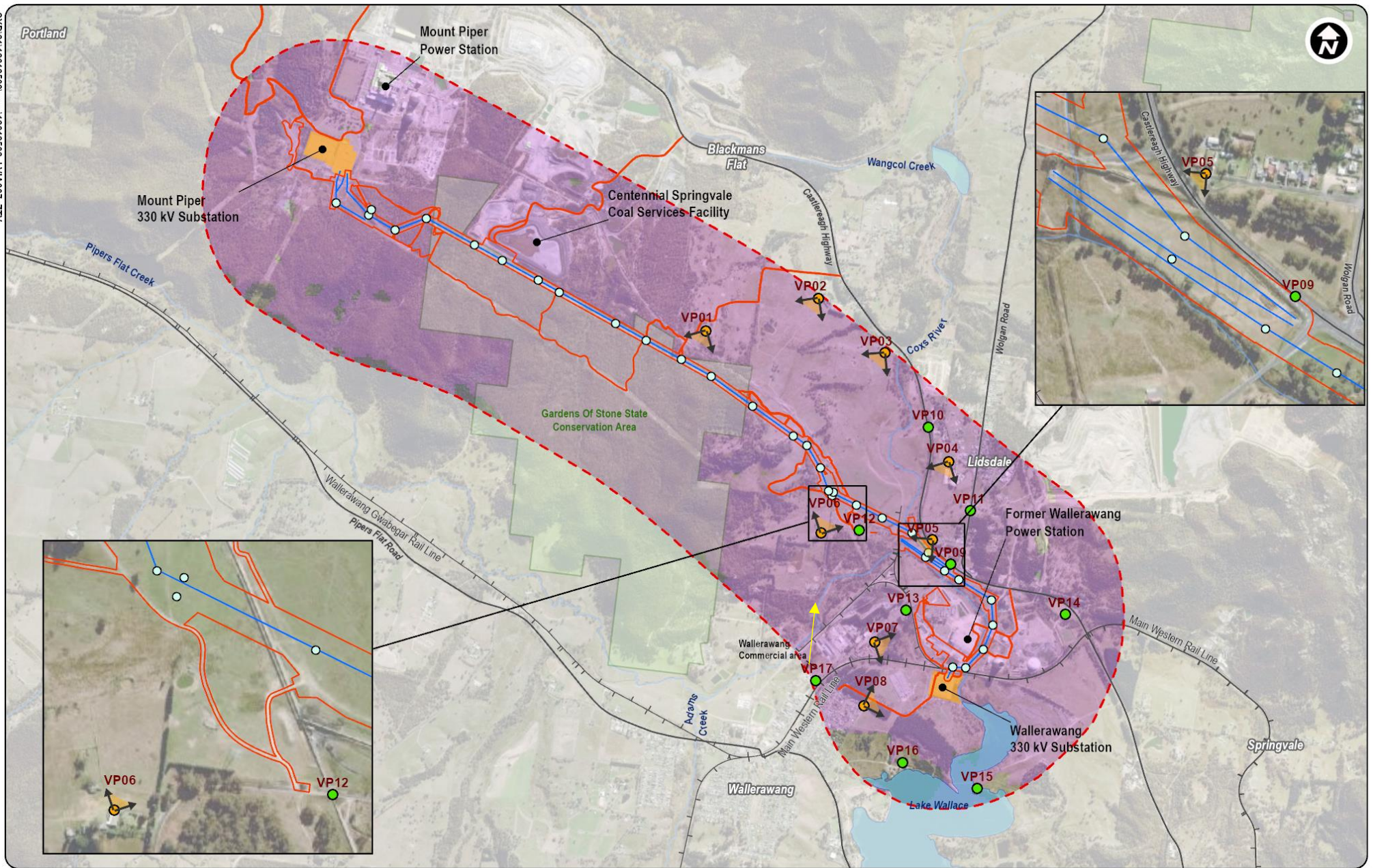
The following viewpoints were identified as requiring a detailed assessment:

- VP05 – Duncan Street, Lidsdale (refer section 6.3.3)
- VP06 – Brays Lane, Wallerawang (refer section 6.3.4).

Figure 6.1 includes detailed insets showing the locations of VP05 and VP06. Appendix A includes details of the photomontages completed at VP05 and VP06 as part of the detailed assessment.

Photomontages were created as part of the detailed assessment utilising the proposed indicative heights of the transmission structures as per the current design. It is noted that these heights are less than the 60 m tall transmission structures considered in the simple assessment and maximum structure heights outlined in the project description within the EIS.

The concept design of the project including the tower heights has since been updated from the simple assessment and the current proposed indicative transmission structure heights are included in the individual assessments in sections 6.3.3 and 6.3.4. The design and final height of these transmission structures would be confirmed as part of the finalisation of the detailed design, however it is expected that the final heights would not vary significantly from the current concept design.



- | | | | |
|--|---|---------------------------------|---------------------------------------|
| Project components | Existing environment | ○ Transmission structure | Zone of theoretical visibility |
| Project footprint | Gardens of Stone SCA | | Not visible |
| Visual assessment study area | Watercourse | | Visible |
| Existing substation | Railway | | |
| New and adjusted transmission line | Roads | | |
- Figure 6.1 Viewshed analysis and viewpoints**

Rev: A
Date: 15/07/2025
1:40,000 @ A4
0 500 1,000
Metres
Grid: GDA2020 MGA Zone 56

6.3.2 Justification for viewpoints not considered in detailed assessment

Viewpoint 1

VP01 is a residential dwelling located on an agricultural property over which an easement for the project would be established. No permanent electricity infrastructure would be located on this property. As this property is easement affected and is subject to an existing property agreement, in accordance with the methodology outlined in the Supplement, this viewpoint was not carried forward for detailed assessment.

Viewpoint 4

VP04 was not carried forward for further assessment owing to several factors such as:

- intervening trees and vegetation and landform providing screening to views from dwellings of the project, as shown in Figure 6.2 and Figure 6.3 which include some locations represented by VP04
- capacity of the overall landscape views to absorb the new infrastructure owing primarily to the scale of the infrastructure within the panoramic views, as shown in Figure 6.2 where existing transmission infrastructure (including existing 330 kV transmission lines) are absorbed into the landscape
- the low scenic quality of the view comprising industrial infrastructure prominent in the view, such as a coal conveyor, transmission structures and lines, urban elements such as dwellings, fences, mobile towers and a patchwork landscape consisting fragmented areas of forests combined with areas of rural grazing land (refer to Figure 6.2 and Figure 6.3).



Figure 6.2 Indicative view from dwellings located north-east of VP04 at Wolgan Road that is representative of VP04



Figure 6.3 *Indicative view from dwellings located in Neuback Street that is representative of VP04*

6.3.3 VP05 – Duncan Street, Lidsdale

Table 6.2 summarises the visual impact assessment for VP05.

Table 6.2 VP05 detailed visual impact assessment

Location and view direction	Coordinates: 33°23'41"S 150°04'49"E Distance: approximately 110 m north-east of closest proposed 330 kV transmission structure South-west view from the front verge of a residential property located at 23 Duncan Street, Lidsdale. The existing view from VP05 is representative of about 31 residential properties located at the southern end of Wolgan Road in the vicinity of Duncan Street. The viewpoint is positioned on the most affected receiver located near the western end of Duncan Street. Other receivers capture by this viewpoint would have some views of the project however due to screening vegetation along Duncan Street these views would be partial or not present. Photographs were taken from the street near the front boundary to show a worst case view.
Description of existing view	Views from inside the existing dwelling would currently be of the dense shrub planting along the front façade that would block all visibility from the south facing windows. From the front yard, the view is of a rural street in the foreground with informal, wide grassed verge areas with power poles and overhead lines and a hard paved street with gravel shoulders. Across the street, a continuous row of native trees provide a partial buffer of the B55 Castlereagh Highway on an embankment and transmission line infrastructure immediately to the south of the highway including an existing transmission line structure. Two existing, 330 kV steel transmission structures up to 43 m tall, are located south of the B55 Castlereagh Highway and are strong vertical elements in the view where it is not screened by existing trees. There is an informal vehicle turnaround in the foreground of the view and a bridge associated with the B55 Castlereagh Highway forming part of an unmaintained embankment to the south. The existing view from this viewpoint is shown in Figure 6.4.
Sensitivity	Moderate – Primary views from private residential dwellings zoned as R5 Large Lot Residential. – Private residential visual receivers with generally long viewing periods of the project.
Scenic quality	Very low – Highly modified landscape with visible infrastructure including transmission structures, overhead power lines, the B55 Castlereagh Highway and associated bridge and an unmaintained highway embankment in the foreground of the view.
Overall visual sensitivity	Low
Construction	
Anticipated impacts	Construction works within the view would be associated with the removal of existing transmission structures and the construction of the two new transmission structures closer to the viewpoint. Works would occur south of the B55 Castlereagh Highway and views of construction activities, including the construction compounds in the former Wallerawang Power Station, would likely be mostly, if not entirely, obscured due to the existing topography and vegetation. Construction machinery is potentially visible in the view and may include the tops of excavators, bulldozers, graders and/or mobile cranes. Night works will likely be required at this location and may result in some potential lighting impacts on nearby residential receivers noting that the embankment would screen any direct impacts.
Magnitude rating	Low The impacts from construction would be temporary, taking up to a year to complete, and screened at ground level by the highway embankment. There is only a minor alteration to landscape features through the introduction of cranes that are uncharacteristic within the existing landscape character.
Overall impact rating	Low

Operation	
Anticipated change to view	Two new 330 kV transmission structures (TS8C and TS9D) and transmission lines replace the existing structure (TS9) south of the B55 Castlereagh Highway. The new structures, TS8C and TS9D, would be approximately 46 and 55 m respectively in height as per the current concept design (refer to section 6.3 for more details). The photomontage (see Figure 6.5) was developed using these heights. The new structures would include similar conductors as the existing structures. The northern most of the two new transmission structures will be located approximately 35 m closer to the visual receivers on Duncan Street than the existing transmission structure, therefore appearing more prominent in the view. The proposed view from this viewpoint with the introduction of project infrastructure is shown in Figure 6.5.
Occupied cells (magnitude)	25 (refer Appendix A)
Magnitude rating	Moderate Within the view, the project involves the removal of an existing transmission tower and installation of two new transmission towers. The methodology applied to determine the moderate magnitude rating does not take into account there is an existing tower currently in the view. If the presence of the existing infrastructure was considered then the magnitude would be reduced.
Overall impact rating	Low



Figure 6.4 *VP05 existing view*



Figure 6.5 *VP05 proposed view with new transmission line infrastructure*

6.3.4 VP06 – Brays Lane, Wallerawang

Table 6.3 summarises the visual impact assessment for VP06.

Table 6.3 VP06 detailed visual impact assessment

Location and view direction	Coordinates: 33°23'40"S 150°04'13"E Distance: approximately 320 m south of the nearest proposed 330 kV transmission structure North-east view from the residential dwelling "Fairview" located at 233 Brays Lane, Wallerawang. Permission was granted by the property landowner at this viewpoint to undertake photography from within the property boundary near the primary dwelling. This viewpoint is primarily capturing the views from the residential dwelling outlined above, however it is also considered to be representative for two properties which are located further south. The selected viewpoint location is therefore considered to be the most affected receiver with other receivers to have lesser impacts due to increased distance and also the presence of the primary viewpoint within their views.
Description of existing view	Views from the dwelling comprise a rural setting with an open grassed lot, rural fencing, residential boundary screen planting including a conifer hedge to the east providing screening to Brays Lane, sheds and outbuildings. There are currently six existing transmission structures and associated lines visible within the view. An existing 330 kV transmission structure is located approximately 150 m to the north with three further 330 kV structures visible on hilly terrain to the north-west. There is also an existing 132 kV transmission line in the background, including two structures that are partially visible further north as marked by red arrows in Figure 6.6.
Sensitivity	Moderate – Primary view from inside private residential dwelling zoned as RU1 Primary Production. – Private residential visual receivers with generally long viewing periods towards the project.
Scenic quality	Low – Hilly and undulating terrain with partial, distant ridgelines. – Predominately cleared grazing pastureland with areas of scattered remnant native trees and vegetation on slopes. – Modified landscape with visible infrastructure including transmission structures.
Overall visual sensitivity	Moderate
Construction	
Anticipated impacts	Construction works within the view would include the removal of the existing 132 kV transmission structures, site establishment works, earthworks, construction of footings and foundations and assembly of new 330 kV transmission structures. Temporary site fencing and signage may be required and typical machinery used for construction works would include excavators, bulldozers, graders and mobile cranes. Night works may be required, however there would only be minimal lighting impacts due to the distance of the works from the receiver. The impacts from construction would be temporary and primarily limited to the tower located in the centre of the view.
Magnitude rating	Low The impacts from construction would be temporary, taking up to a year to complete, and partly screened at ground level by foreground vegetation. There are only minor alterations to the landscape features through the introduction of cranes and construction equipment that are uncharacteristic with the existing landscape character.
Overall impact rating	Low

Operation	
Anticipated change to view	Five new 330 kV transmission structures (TS12D, TS13D, TS14D, TS13A and TS14A) would replace two existing 132 kV wooden pole transmission structures (TS14 and TS15) to the north. The location of retained and proposed transmission structures are shown in detail in Appendix A. The five new transmission structures in this view would consist of three steel lattice towers (TS12D, TS13D, TS14D), one concrete pole (14A) and one concrete three pole structure (13A). TS13D and TS14D would follow a similar alignment to the existing 132 kV transmission line, but would be up to three times taller than the existing wood pole structures. TS13A and TS14A would be new structures required to enable the stepdown of the 132 kV transmission line from the proposed steel lattice towers to the existing 132 kV wood pole structures. TS12D would be a new steel lattice tower located away from any existing transmission lines. All new transmission structures would be located north of the existing 330 kV transmission line (and associated structures) which runs between the project footprint and VP06 about 150 m north of VP06. The proposed new structures would be located at their closest about 330 m north of VP06. The transmission structure model heights utilised for creating the photomontage (see Figure 6.7) are, starting from the left (west); 49 m tall, the tower in the centre is 48 m tall while the tower furthest right partially screened behind existing trees is 46.5 m tall and it is noted that these heights are indicative based on the current concept design (see section 6.3 for more details). VP06 is therefore an altered view consisting of additional transmission infrastructure located in the middle ground of the view. The proposed view from this viewpoint with the introduction of project infrastructure is shown in Figure 6.7. A more detailed view of the positioning of the new structure within this photomontage can be found in Appendix A.
Occupied cells (magnitude)	18 (refer Appendix A)
Magnitude rating	Moderate While the assessment determined a moderate rating, the methodology applied does not take into account the two existing wood pole structures in the existing view that will be replaced. If the presence of the existing infrastructure was considered then the magnitude would be reduced.
Overall impact rating	Moderate



Figure 6.6 VP06 existing view, location of existing 132 kV transmission line, with existing structures to be replaced shown with green arrows



Figure 6.7 VP06 proposed view with new transmission line infrastructure

6.4 Public viewpoints

Nine public receiver locations were identified in the study area, refer Appendix D. Five of the receivers are road corridors while four are public places. The two locations identified as moderate impacts from the Simple assessment (section 6.2) are discussed below.

VP09 – B55 Castlereagh Highway northbound and southbound carriageways (west of Main Street)

The view is from vehicles travelling on Castlereagh Highway where there is a posted speed limit of 80 km/h and existing views contain existing transmission structures adjacent to the roadway (see Figure 6.8). During construction, works within the view would include the removal of the existing 132 kV transmission structures, site establishment works, earthworks, construction of footings and foundations and assembly of new 330 kV transmission structures. Temporary site fencing and signage may be required and typical machinery used for construction works would include excavators, bulldozers, graders and mobile cranes.

During operation, the project would introduce new transmission structures located south of the existing 330 kV transmission structures as well as distribution lines located along the road verge. The new infrastructure would be located about 90 metres south of the road adjacent to Main Street. Large elements of the former Wallerawang Power Station are visible and the overall scenic quality is determined to be low. The introduction of the new infrastructure would not substantially alter or reduce the existing visual amenity of the highway corridor, therefore it was determined that the viewpoint does not warrant further assessment.



Figure 6.8 View at VP09 along Castlereagh Highway west of Main Street including existing transmission infrastructure

VP12 – Brays Lane

The view is east from vehicles travelling along a single lane rural road which has a low volume of traffic. The existing view includes the Centennial Coal conveyor which is prominent in the view as it currently crosses and runs adjacent to Brays Lane (see Figure 6.9). Views to some existing transmission tower infrastructure is also a prominent visual feature within the existing view.

Construction works within the view would include the removal of the existing 132 kV transmission structures, site establishment works, earthworks, construction of footings and foundations and assembly of new 330 kV transmission structures. Temporary site fencing and signage may be required and typical machinery used for construction works would include excavators, bulldozers, graders and mobile cranes.

During operation, the project would introduce a new section of transmission line north of Brays Lane which would also cross Brays Lane. The presence of the existing coal and transmission infrastructure results in a very low scenic quality and there is a very low visual receiver sensitivity from vehicles traveling along the rural access lane. The introduction of the new infrastructure would not substantially alter or reduce the existing visual amenity from Brays Lane, therefore it was determined that the viewpoint does not warrant further assessment.



Figure 6.9 View at VP12 along Brays Lane looking east

6.5 Night lighting impacts

There is no permanent lighting proposed as part of the project, therefore there would not be any visual impacts from night lighting during operation.

The proposed project construction hours would be from 7am to 6pm Monday to Sunday, generally during daylight hours. In addition to this, compounds would be used from 6pm to 7pm Monday to Friday following the completion of construction work at 6pm. Vehicle movement and cleaning and storage of vehicles and equipment would be the key activities anticipated at the compounds during this period. On weekends, construction work would end earlier and compound use would cease at 6 pm.

In addition to the proposed project construction hours outlined above, there may be a need to undertake works between 6pm to 7am Monday to Sunday. During these hours, lighting would be required to undertake works safely. Works between 6 pm and 7 am would occur where an outage recall is required to re-energise the transmission lines at short notice (usually within 72 hours of a notice) as a result of transmission network constraints. Works on roads and over the Main Western Rail Line may also be required during this period to minimise impacts. Details of times and locations of night works would be determined during detailed construction planning however, such work is expected to be infrequent and of a duration of up to 72 hours potentially impacting receivers on more than one occasion.

Visual impacts from night lighting during construction are likely to have limited visual impacts on visual receivers throughout most of the study area due to distance and screening from existing topography and vegetation. Some impacts may occur where construction is located near residential dwellings such as at VP05 near Duncan Street.

At VP05 the Castlereagh Highway embankment would screen construction lighting located at ground level and only the glow of such lighting is likely to be visible. Measures that would be implemented to minimise impacts of night lighting include:

- only use lighting for areas when required
- switch off lighting when not required
- direct light away from residential properties, if possible.

6.6 Air traffic impacts

Elevated views of the project from aircraft generally take in a reasonably broad context. In this case, the landscape includes existing transmission structures, large coal mining facilities (such as the Centennial Springvale Coal Services facility), power stations, substations, highways and roads, and rural and residential development. At a high altitude, visual receivers generally view this landscape as a whole, hence the project is unlikely to make any discernible changes during construction or operation to the broad views and landscape character of the area.

There are no commercial or private airstrips within a 30 km radius of the project but some flight paths from more distant airports or facilities may provide long-distance views of the project for aircraft passengers. The closest airport is Bathurst Regional Airport, approximately 55 km west of the project as detailed in the Aviation Impact Assessment found in Appendix D to Technical Paper 9 – Hazards and Risks. Visual receivers (passengers) on flights travelling between Bathurst and Sydney may have views towards the project.

Scenic helicopter flights run by private companies also operate from Bathurst and the Greater Blue Mountains World Heritage Area. A desktop review of flights by private companies such as Panair (Panorama Airways) was undertaken and some scenic flights may have routes in the vicinity of Lithgow.

Views of the project within the wider landscape may be possible from scenic flights or aircraft travelling to or from these airports. However, visual receivers are located at a high altitude with elevated views of the broad scale landscape. Depending on the altitude, it may be possible, that clearance of vegetation within the Gardens of Stone SCA may be noticeable from the contrast between landscape colours (for example, dark green hues) of existing vegetation to softer colours representing the absence of vegetation (for example, brown and yellow lighter hues). If vegetation removal is noticeable at altitude, the impact to air traffic visual receivers is expected to be low due to the discrete location of the project and the view of the project within the broader landscape.

7. Cumulative impacts

The introduction of transmission and renewable energy projects have the potential to contribute to cumulative impacts over time by altering the perception of the overall visual quality within a region.

A total of 10 projects within 20 km of the project footprint were identified for consideration as part of the cumulative impact assessment and are shown in Figure 7.1. The following projects are considered:

- Wallerawang Battery Energy Storage System
- Mount Piper Battery Energy Storage System
- Great Western Battery Energy Storage System
- Pinecrest Battery Energy Storage System
- Lake Lyell Pumped Hydro Energy Storage
- Ben Bullen Wind Farm
- Sunny Corner Wind Farm
- Wallerawang Power Station Ash Dam
- Wallerawang residential subdivision (DA226/22)
- Wallerawang Station upgrades.

Table 7.1 provides a brief description and outlines the potential cumulative impacts when considered with this project. Two projects were identified as having potential cumulative visual impacts for sensitive receivers identified for the project, these being the Great Western BESS and Pinecrest BESS. Both projects would be visible from VP06.

The Great Western BESS, located about 265 m south of VP06 (233 Brays Lane), is anticipated to have a moderate-low visual impact on this visual receiver (AECOM 2022).

The Pinecrest BESS is located adjacent to the project footprint with an EIS currently under preparation. No information is currently available with regards to the visual impacts of the project, however the scoping report for the project (Banpu Energy 2025) shows the project boundary abutting the Centennial overland conveyor and occupying land that slopes to lower elevations in the north. There is potential that the topography and existing vegetated screen at the visual receiver property (VP06) may screen the view to the Pinecrest BESS plant however it may be possible that some elements of the BESS would be visible from VP06.

These developments may potentially be viewed simultaneously with this project from VP06. As a result, VP06 (Figure 12.4) would likely experience the greatest potential cumulative visual impacts due to the intensification of electricity infrastructure in the view from the introduction of ground level battery storage elements into the viewpoint.

The landscape character of the study area is industrial and rural, containing significant visible infrastructure such as existing transmission lines, power stations, coal facilities and agricultural activities. Cumulative impacts on landscape character are possible with additional development in the area. As other nearby projects, such as the BESS projects are developed, the cumulative change across the landscape would incrementally shift the rural agricultural landscape character towards a more industrial landscape character. This project has been co-located with existing transmission lines as much as possible and therefore it is considered that the project's contribution to cumulative landscape character impacts would be low.

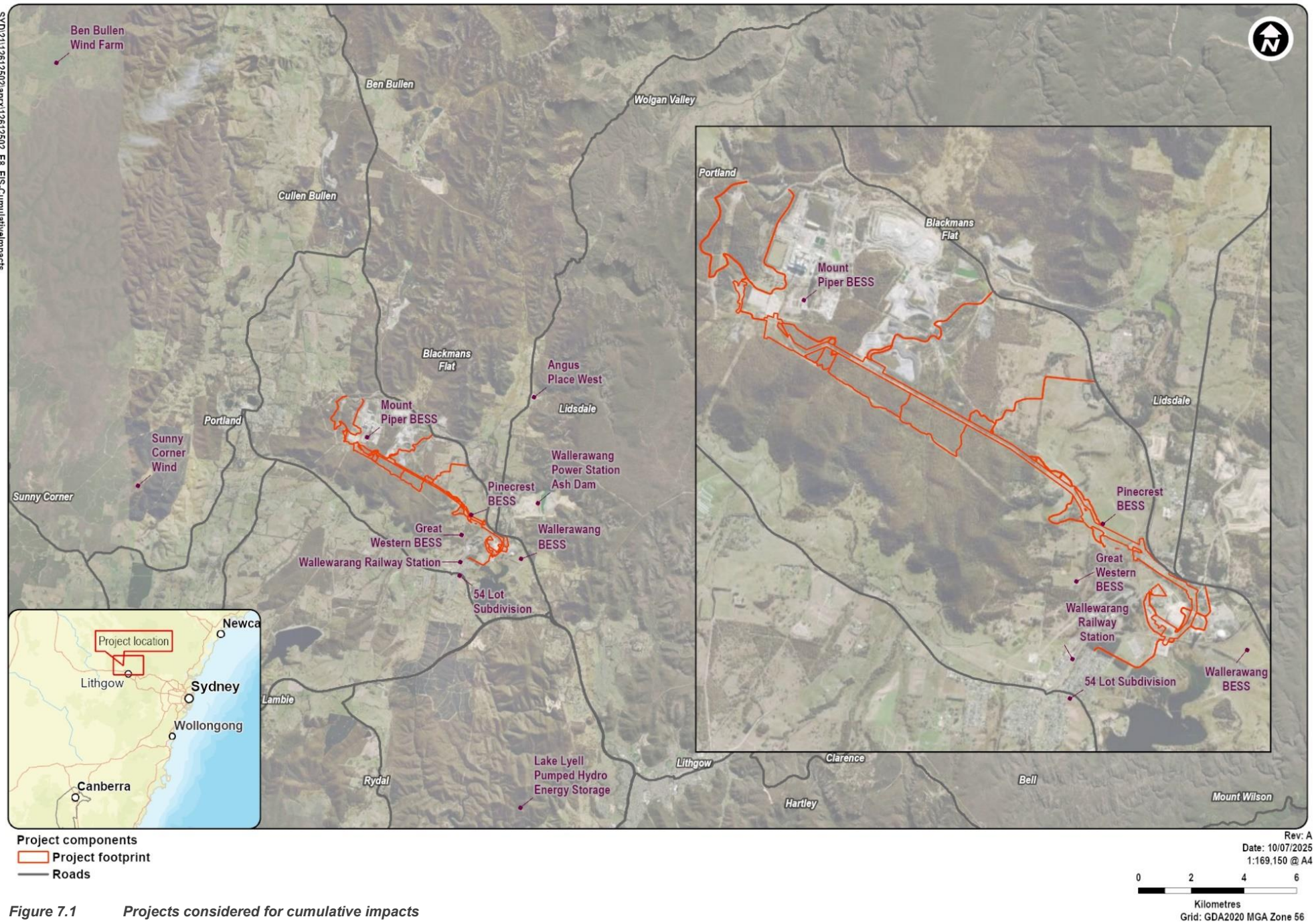


Table 7.1 *Potential cumulative impacts of relevant future projects*

Relevant future project	Scope	Approximate location	Status/timeframe/ operational period	Potential for cumulative impact
Wallerawang BESS	Design changes to optimise the layout of the approved Wallerawang BESS (500 MW and 1,000 MWh of battery storage capacity)	500 m east of the project footprint	Approved 4/8/2022 Current modification at response to submissions stages Construction period of 1 to 2 years, expected to commence from 2025, construction does not appear to have commenced Operational period unchanged	Visual receivers within the study area are unlikely to have views of the BESS due to distance and intervening vegetation and structures. Cumulative impacts on landscape character are assessed as low as the BESS is located within an existing industrial area and therefore would not alter the existing character.
Mount Piper BESS	Development of a grid-scale BESS with a capacity of up to 500 MW	Immediately north of the project footprint	Approved 15/11/2024 Construction period of 18-24 months expected to commence from mid-2026 at the earliest Potentially operational by 2027/2028 and would operate for about 20 years	The visual receivers within the study area do not have views of the western end of the project and would also not have views of the BESS due to distance, landform and surrounding bushland. Cumulative impacts on landscape character are assessed as low as the BESS is located within an existing industrial area and therefore would not alter the existing character.
Great Western BESS	Development of a 500 MW / 1,000 MWh BESS and associated infrastructure	300 m west of the project footprint	Approved 2/11/2023 Project has not yet commenced construction and construction start date is not known however is expected to occur over 12-14 months once the modification is approved The BESS is intended to have an operational life of up to 20 years	The Great Western BESS could potentially be viewed simultaneously with the project by visual receivers south of the proposed transmission line or by receivers with elevated views from dwellings to the north. The Great Western BESS is located about 265 m south of VP06 (233 Brays Lane). VP06, looking south, is anticipated to have a moderate-low visual impact from the BESS project (AECOM 2022). Visual receivers at VP06 (and at other dwellings on Brays Lane) would likely experience the greatest cumulative visual impacts with the two developments located within views to the north and south. This assessment has identified a moderate visual impact from VP06 looking north. The project and the Mount Piper BESS would also result in cumulative impacts on landscape character with the introduction of new infrastructure into a rural landscape that borders existing natural bushland of the Gardens of Stone SCA. This landscape also contains existing transmission lines and therefore represents a slight intensification of such infrastructure.

Relevant future project	Scope	Approximate location	Status/timeframe/ operational period	Potential for cumulative impact
Pinecrest BESS	Development of 500 MW battery storage capacity and 1,000 MWh of storage with (2-hour duration) connecting to the grid via underground cabling	Layout shown in scoping report is located within project footprint, with Transgrid undertaking ongoing consultation with Banpu Energy regarding positioning of the site.	Scoping report prepared with SEARs not yet issued EIS is expected to be submitted in early 2026 Construction period of 18 months commencing in late 2026 if approved. Operations proposed to start in 2028	The Pinecrest BESS could potentially be viewed simultaneously with the project by visual receivers to the south such as VP06 (233 Brays Lane), motorists using the Castlereagh Highway or by receivers with elevated views from dwellings to the north. No information is available on visual impacts from the Pinecrest BESS, however the BESS's Scoping Report (Banpu Energy 2025) shows the project boundary abutting the Centennial overland conveyor and occupying land that slopes to lower elevations in the north. There is potential that the topography may screen the Pinecrest BESS plant from VP06. Cumulative impacts on landscape character are assessed as low as the BESS is located within an existing rural landscape where there are existing views of transmission structures and power station infrastructure thereby having minimal cumulative impacts on landscape character.
Lake Lyell Pumped Hydro Energy Storage	Development of the Lake Lyell Pumped Hydro Energy Storage Scheme (that will provide between 300 to 350 MW of electricity generating capacity for up to 8 hours during peak demand	10 km south of the project footprint	EIS in preparation Technical design expected to conclude in 2025. Construction expected commence in late 2026 and to take four years with operation commencing in 2029	There are no anticipated cumulative impacts with the project due to distance and intervening topography containing views locally.
Ben Bullen Wind Farm	Construction of approximately 64 wind turbine generators, a BESS and ancillary infrastructure	20 km north-west of the project footprint	EIS in preparation Construction in 2028 for 18-24 months Operational life of 35 years+	There are no anticipated cumulative impacts with the project due to distance and intervening topography containing views locally.
Sunny Corner Wind Farm	Construction of approximately 80 wind turbine generators, a BESS and ancillary infrastructure	6 km west of the project footprint	EIS in preparation Construction in 2030 for 36 months Operational life of 30 years	There are no anticipated cumulative impacts with the project due to distance and intervening topography containing views locally.
Wallerawang Power Station Ash Dam	Use of part of the lands lying north of the Castlereagh Highway that were once used by the former Wallerawang Power Station as coal ash dam repositories	Immediately north of the project footprint	Approved 13/10/2023 The modification proposes an additional ten years for the importation of capping material	There are no anticipated cumulative impacts to landscape character or visual amenity as new works will occur within the existing site and existing landform and vegetation screen views of the site from nearby visual receivers.

Relevant future project	Scope	Approximate location	Status/timeframe/ operational period	Potential for cumulative impact
Residential subdivision DA226/22	Torrens Subdivision – 1 Lot into 54 Residential Allotments, 4 New Roads, 2 lots for drainage and public reserve Allotment	19 Barton Avenue Wallerawang 2 km south-west of the project footprint	Currently being re-exhibited till 13 June 2025	No anticipated cumulative impacts as the proposed residential development is located at a distance from the project and comprises relatively low residential structures only.
Wallerawang Railway Station upgrade	Works to upgrade the existing station, closed in 1989, so that passenger services can be restated.	850 m southwest of project footprint	Project has been announced on Transport for NSW website Early enabling works will be carried out from March to August 2025 Once the design is finalised, construction will commence later in 2025, with re-opening of the station planned for late 2026	There are no anticipated cumulative impacts with the project due to distance and intervening topography containing views locally.

8. Performance objectives and mitigation

8.1 Performance objectives

A moderate visual impact was identified for private viewpoint VP06. In cases where impacts are moderate or higher, the Supplement requires assessment against the relevant performance objectives (in Table 9 of the Supplement). The relevant performance objectives are:

- Visual impact mitigation should be implemented within the project corridor and/or offered to the affected landowner and should be proportionate to the scale of impact.
- There is no expectation this mitigation should eliminate the view of the development entirely, but it must reduce the impact to an acceptable level and not create unacceptable visual impacts to other receivers.

The mitigation measures included in Section 8.2 include investigating screening vegetation for VP06, in consultation with affected landowners. It is considered that the implementation of screening vegetation would reduce the visual impacts to an acceptable level and would not create unacceptable visual impacts to other receivers.

8.2 Mitigation measures

Previous efforts to mitigate visual and landscape character impacts were undertaken as part of the overall project design including:

- minimising the transmission line length to the extent practicable
- using existing easements and positioning new infrastructure adjacent to existing transmission lines where possible
- minimising vegetation clearance requirements where possible.

Table 8.1 includes additional mitigation and management measures that could be implemented to potentially reduce the moderate-low impacts to landscape character and moderate visual impacts identified in sections 5 and 6. Measures to avoid and minimise vegetation clearing (see Technical Report 2 – Biodiversity Development Assessment Report) would also assist in mitigating landscape and visual impacts.

Table 8.1 Landscape and visual impact mitigation and management measures

Impact	Environmental safeguard	Timing
Impacts on LCZ1	The removal of existing trees and vegetation will be minimised in the detailed design and construction as much as practicable to retain as much natural bushland character as possible. Trees with high associated conservation value will be identified to be retained and protected where practicable.	Detailed design
Impacts of access track construction on landscape character and visual amenity	Temporary and permanent access tracks will be designed to minimise the removal of existing vegetation and minimise any landform changes to reduce the overall landscape character and visual impacts.	Detailed design
Visual impacts on sensitive visual receivers	Opportunities to plant screening vegetation to minimise impacts on VP06 will be investigated in consultation with the affected landowner(s).	Detailed design
Lighting impacts	Lighting during construction of the project will be designed and operated in accordance with guidelines in <i>AS 4282 2019 Control of the obtrusive effects of outdoor lighting</i> . Directional lighting will be used to minimise the effects of light spill outside the easement as far as possible.	Detailed design and construction

9. Conclusion

9.1 Summary of landscape character assessment

Four landscape character zones were identified within the study area. Overall landscape character impacts were assessed as moderate-low for LCZ1 and LCZ4 primarily due to moderate sensitivity ratings attributed to the natural qualities of bushland and rural areas. Results are summarised in Table 9.1.

Overall landscape character impacts for LCZ2 and LCZ3 were assessed as low due to anticipated changes from the project being generally consistent with an existing, highly modified landscape character including multiple existing transmissions lines, supporting infrastructure and other industrial uses within the study area.

Table 9.1 Landscape character impact assessment summary for construction and operation

Landscape character zone	Sensitivity	Magnitude	Overall landscape character impact rating
LCZ1 - Forested Hills	Moderate	Low	Moderate-low
LCZ2 - Agricultural lands	Low	Low	Low
LCZ3 - Industrial	Low	Low	Low
LCZ4 - Rural subdivision	Moderate	Low	Moderate-low

9.2 Summary of visual impact assessment

There were approximately 269 private and nine public visual receivers identified in the study area. Most of the private receivers consisted of dwellings in Lidsdale and Wallerawang as well as in the Wallerawang commercial area. The public visual receivers identified included local roads, Castlereagh Highway, the Wallerawang commercial Main Street area and other public open spaces, including parks and a cemetery.

Eight private viewpoints and nine road corridor and public viewpoints were assessed as part of the simple assessment (Table 9.2). Six viewpoints, VP01, VP04, VP05, VP06, VP09 and VP12 were identified as requiring a further assessment.

VP01 is an easement affected property and was therefore not carried forward for further assessment (as per the methodology in the Supplement).

VP04 was not carried forward for further assessment due to intervening vegetation screening views, the capacity of the landscape to absorb the new infrastructure and the low scenic quality of the existing view.

The results of further assessment of VP05 and VP06 are summarised in Table 9.2.

VP05 was assessed as a low overall impact assessment rating. VP06 was assessed as a moderate visual impact rating owing primarily to a moderate magnitude rating when applying the grid tool overlain on photomontages.

Table 9.2 Detailed visual impact assessment summary

Viewpoint	Number of receivers considered	Viewpoint sensitivity	Scenic quality	Overall visual sensitivity	Magnitude	Overall visual impact
VP05	31	Moderate	Very low	Low	Moderate	Low
VP06	3	Moderate	Low	Moderate	Moderate	Moderate

It was determined that public viewpoints VP09 and VP12 did not warrant further assessment considering their locations along a highway and rural lane with existing views of the coal loader and transmission infrastructure in the foreground.

Mitigation measures have been identified to reduce visual and landscape character impacts and to address the performance objectives identified in the Supplement for VP06. Mitigation measures include:

- minimising vegetation removal along transmission line easements and access roads to maintain landscape character and visual screening
- consulting with affected landowners to consider opportunities for additional screen planting either on adjacent public land
- designing construction lighting to minimise impacts on nearby residential receivers.

10. References

- Landscape Institute and Institute of Environmental Management & Assessment UK.(2013). *Guidelines for Landscape and Visual Impact Assessment*, 3rd Edition.
- Lithgow City Council. (2014). *Lithgow Local Environment Plan*,
<https://legislation.nsw.gov.au/view/whole/html/inforce/current/epi-2014-0824>. Accessed 27/05/2024.
- Lithgow City Council 2020, *Lithgow 2040 Local Strategic Planning Statement*.
- Natural England, Scottish Natural Heritage and Countryside Council. (2011). *Landscape Character Assessment Guidance*.
- NSW Government, Department of Environment, Energy and Science n.d., Dry sclerophyll forests (shrubby sub-formation), Available at:
[https://threatenedspecies.bionet.nsw.gov.au/VegFormation?formationName=Dry+sclerophyll+forests+\(shrubby+sub-formation\)](https://threatenedspecies.bionet.nsw.gov.au/VegFormation?formationName=Dry+sclerophyll+forests+(shrubby+sub-formation)). Accessed 19/12/2024.
- NSW Government, Department of Environment, *Energy and Science n.d.*, *Grassy Woodlands*, Available at:
<https://threatenedspecies.bionet.nsw.gov.au/VegFormation?formationName=Grassy+woodlands>. Accessed 19/12/2024.
- NSW Government, Department of Planning and Environment. (2018). *NSW Transmission Infrastructure Strategy*, Available at: https://www.energy.nsw.gov.au/sites/default/files/2022-08/2018_11_NSW_TransmissionInfrastructureStrategy.pdf Accessed 20/05/2024.
- NSW Government, Department of Planning and Environment. (2022). *Central West and Orana Regional Plan 2041*, Available at: <https://www.planning.nsw.gov.au/sites/default/files/2023-03/central-west-and-orana-regional-plan-2041.pdf> Accessed 27/05/2024.
- NSW Government, Department of Planning and Environment. (2022). *Cumulative Impact Assessment Guidelines for State Significant Projects*, Available at: <https://www.planning.nsw.gov.au/sites/default/files/2023-03/cumulative-impact-assessment-guidelines-for-ssp.pdf>. Accessed 20/05/2024.
- NSW Government, Department of Planning and Environment.(2022). *Gardens of Stone State Conservation Area Plan of Management*, Available at: <https://www.environment.nsw.gov.au/-/media/OEH/Corporate-Site/Documents/Parks-reserves-and-protected-areas/Parks-plans-of-management/gardens-of-stone-state-conservation-area-plan-of-management-220570.pdf>. Accessed 27/05/2024.
- NSW Government, Department of Planning, Housing and Infrastructure (DPHI). 2025. *Transmission Guideline Technical Supplement for Landscape Character and Visual Impact Assessment*. Version 1.1. April 2025.
- NSW Government, Department of Planning, Housing and Infrastructure. (2024). *State Significant Infrastructure Guidelines*, Available at: <https://www.planning.nsw.gov.au/sites/default/files/2023-03/state-significant-infrastructure-guidelines.pdf> Accessed 20/05/2024.
- Transgrid. (2024). Cultural Values Assessment - Mount Piper to Wallerawang Transmission line upgrade project.
- Transport for New South Wales. (2023b). Environmental impact assessment practice note EIA-N04 - Guideline for landscape character and visual impact assessment, Version 2.3.
- Traveller. "Wallerawang – Culture and History," Sydney Morning Herald, 26 November 2008. Available at: <https://www.smh.com.au/traveller/inspiration/wallerawang-culture-and-history-20081126-6i4i.html>.

Appendix A

Photomontages



Viewpoint extension
- refer to Viewpoint Notes

Existing View



0° 10° 20° 30° 40° 50° 60° 70° 80° 90° 100° 110° 120° 130° 140° 150° 160° 170° 180°

Proposed View with Design



Coordinates (MGA 55 - 2020)	228449, 6301098
Distance to development	106 m
Viewpoint type	Residential, Primary view
Viewpoint elevation	877 m
View direction	96° - 276°
Horizontal field of view	180°
Camera height	1.5 m
Camera type	Cannon 6D
Lens type	50 mm
Photograph time and date	27 January 2025, 0901

Viewpoint Notes

- The above viewpoint has a 6 degree extension at the top of the image
- This extension has been undertaken to capture the full height of the power towers.
- The camera has been rotated up 6 degree in 3ds max to capture the full extent of the Tower design.
- The grid has been extened up 6 degrees vertically
- The top 6 degrees across the vertical extent of the image has been infilled using A.I image generate within Photoshop 2025
- The dashed box represents the additional 6 degree add using A.I generation

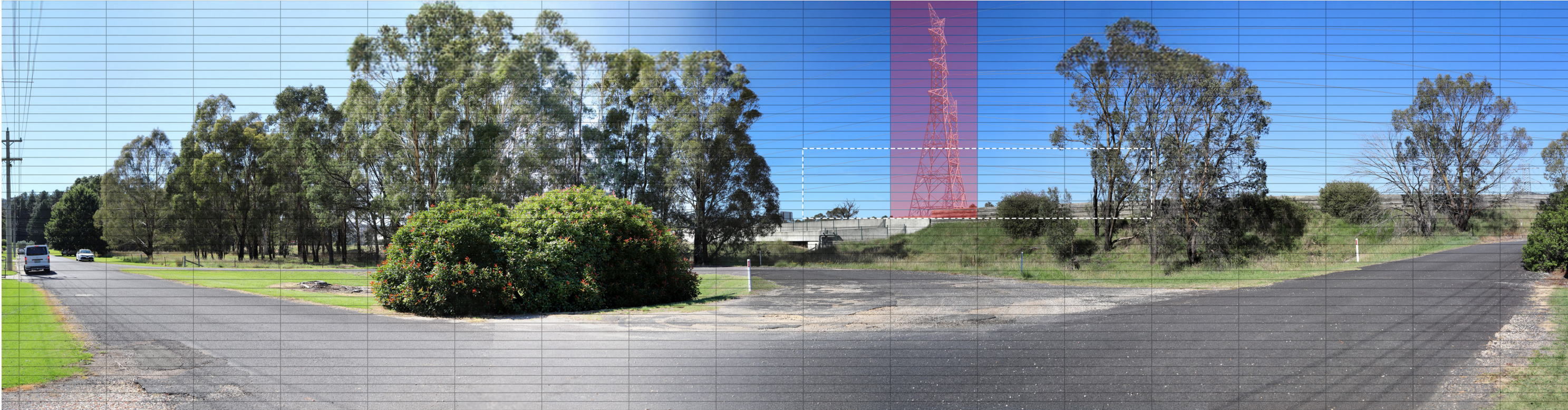
Viewpoint VP 05

Photomontage viewpoint assessment

Mount Piper to Wallerawang Transmission
Line Upgrade
Transgrid

Issue v01
Date 14.08.2025





Proposed View with Design



90° 100° 120° 130° 140°

Inset A



Coordinates (MGA 55 - 2020)	228449, 6301098
Distance to development	106 m
Viewpoint type	Residential, Primary view
Viewpoint elevation	877 m
View direction	96° - 276°
Horizontal field of view	180°
Camera height	1.5 m
Camera type	Cannon 6D
Lens type	50 mm
Photograph time and date	27 January 2025, 0901

Grid Assessment

Occupied cells	25
Magnitude rating	Moderate
Impact rating	Low

Viewpoint VP 05

Photomontage viewpoint assessment

Mount Piper to Wallerawang Transmission
Line Upgrade
Transgrid

Issue v01
Date 14.08.2025





Existing View



0°10°20°30°40°50°60°70°80°90°100°110°120°130°140°150°160°170°180°

Proposed View with Design



Coordinates (MGA 55 - 2020)	227480, 6301161
Distance to development	362 m
Viewpoint type	Residential, Primary view
Viewpoint elevation	895 m
View direction	277° - 97°
Horizontal field of view	180°
Camera height	1.5 m
Camera type	Cannon 6D
Lens type	50 mm
Photograph time and date	27 January 2025, 0916

Viewpoint VP 06

Photomontage viewpoint assessment

Mount Piper to Wallerawang Transmission
Line Upgrade
Transgrid

Issue v01
Date 14.08.2025





Proposed View with Design



70°

80°

90°

100°

110°

Inset A



Coordinates (MGA 55 - 2020)	227480, 6301161
Distance to development	362 m
Viewpoint type	Residential, Primary view
Viewpoint elevation	895 m
View direction	277° - 97°
Horizontal field of view	180°
Camera height	1.5 m
Camera type	Cannon 6D
Lens type	50 mm
Photograph time and date	27 January 2025, 0916

Grid Assessment

Occupied cells	18
Magnitude rating	Moderate
Impact rating	Moderate

Viewpoint VP 06

Photomontage viewpoint assessment

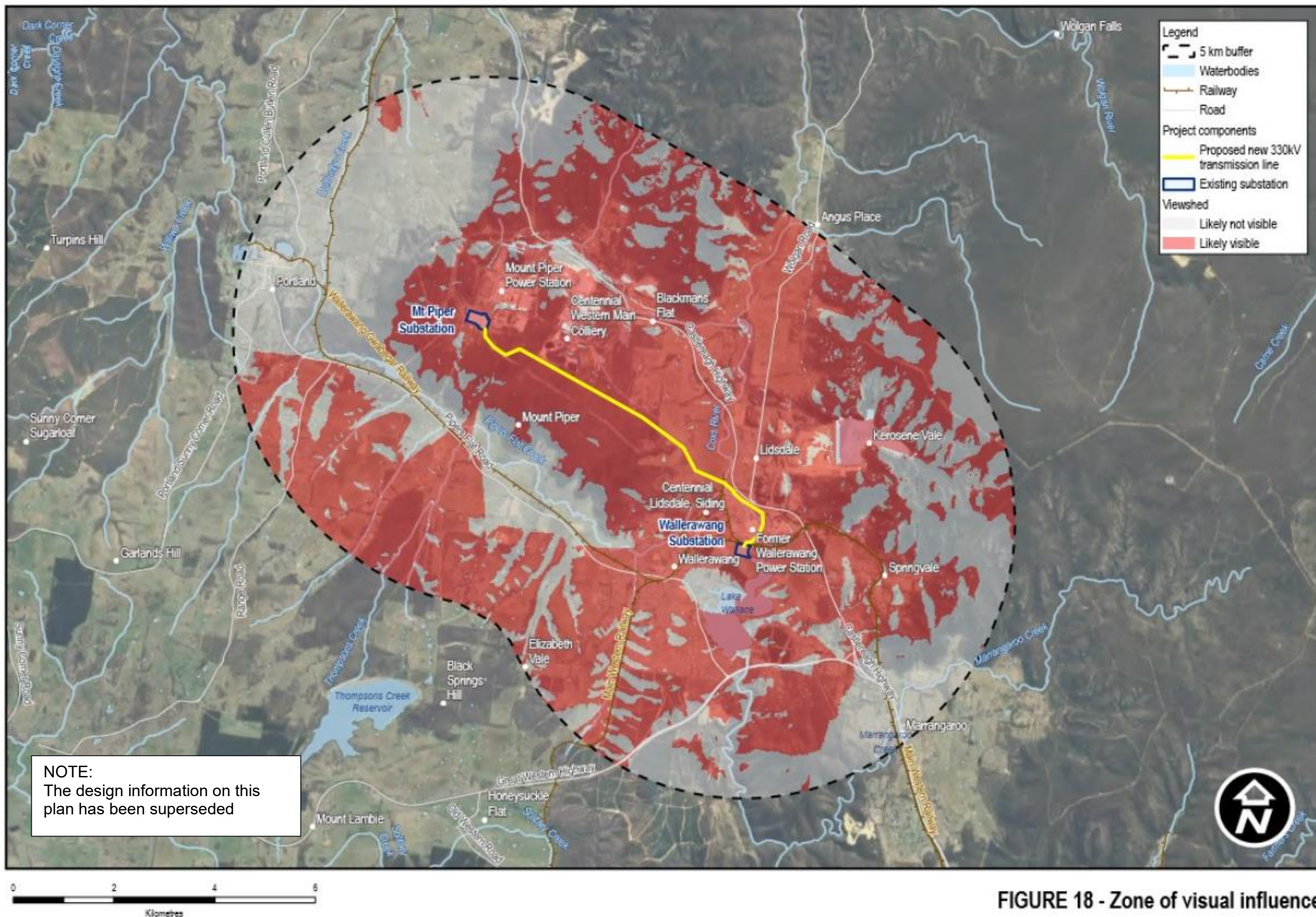
Mount Piper to Wallerawang Transmission
Line Upgrade
Transgrid

Issue v01
Date 14.08.2025



Appendix B

Scoping Stage ZTV



Appendix C

Heritage listings

Table C.1 State heritage listings in the LVIA study area

Listing	Class	Name
I112	General	Church of St John the Evangelist
I440	General	Stone Viaduct Coxs River Wallerawang
I208	General	Wallerawang Junction Railway Station Group
01064	General	Wallerawang rail bridges over Coxs River

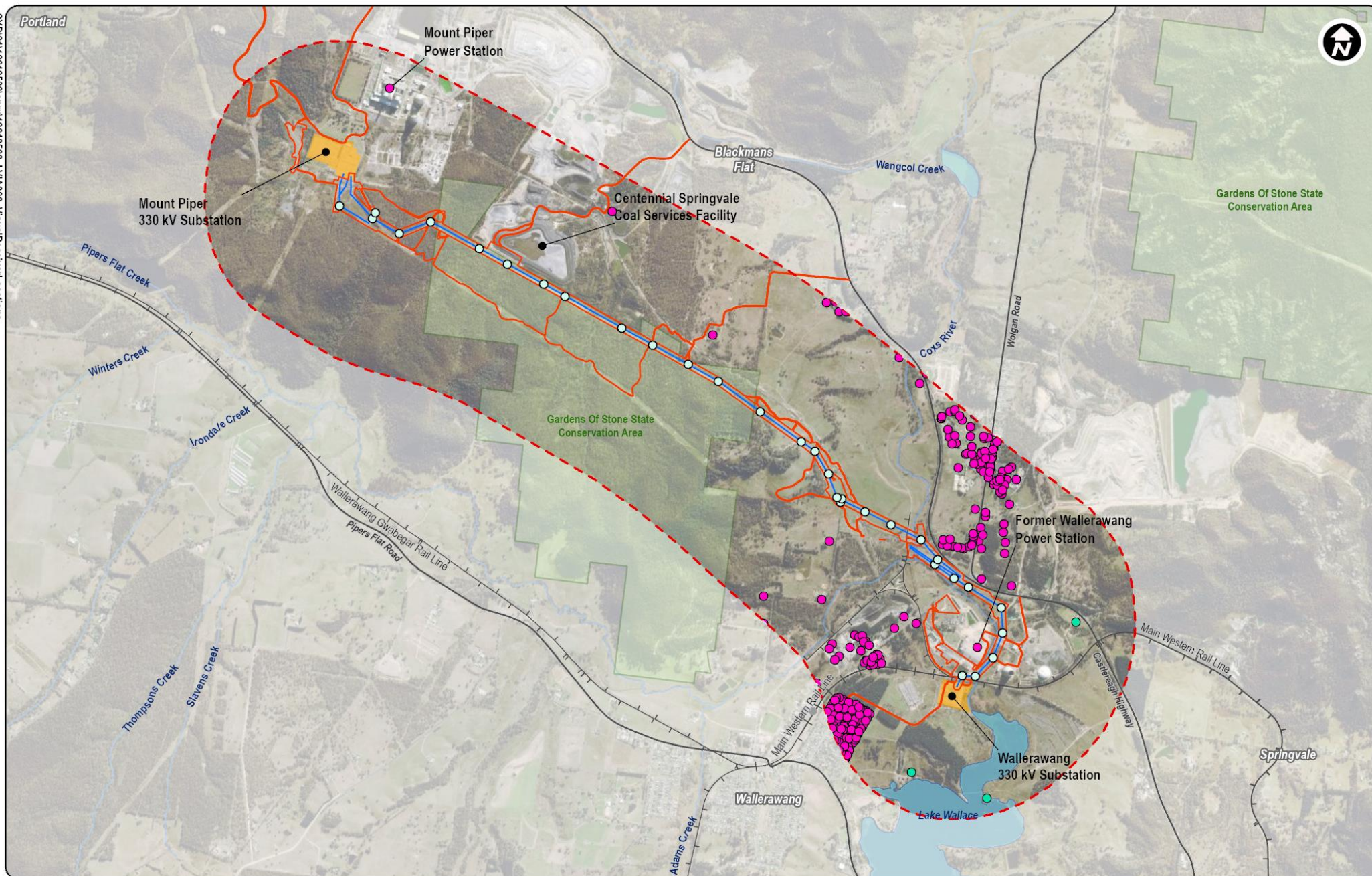
Table C.2 Local heritage listings in the LVIA study area

Listing	Class	Name
I216	Item – General	Railway Cottage
I219	Item – General	Willowvale
A109	Item – Archaeological	Walker-Barton Private Cemetery
I439	Item – General	Tunnel Hill Tunnels and Overbridge
I203	Item – General	Lidsdale House and Gardens
I225	Item – General	Former Wallerawang Public School and Residence
I113	Item – General	Old Wallerawang School (former National School)
I192	Item – General	Meadowside
I193	Item – General	Braemai
I194	Item – General	Uniting Church
I195	Item – General	Cottage
I196	Item – General	Cottage and Stone Barn
I197	Item – General	Windmill Lad Stud
I198	Item – General	Square and Compass Inn (former)
I199	Item – General	Woodlands
I201	Item – General	The Meadows
I202	Item – General	Maddox Lane Group
I204	Item – General	House opposite Lidsdale House
I205	Item – General	Farmhouse
I206	Item – General	Berwindi
I207	Item – General	Bottom Pub
I209	Item – General	Surgery
I210	Item – General	Wang Antiques and Emporium
I211	Item – General	Post Office
I212	Item – General	Former Commercial Banking Co.
I217	Item – General	Cottage
I218	Item – General	Cottages
A184	Item – Archaeological	War Memorial
A108	Item – Archaeological	Wallerawang General Cemetery
A111	Item – Archaeological	Blackmans Flat Roman Catholic Cemetery
I191	Item – General	The Cottage
C13	Conservation area – General	Wallerawang

Appendix D

Visual receiver locations

SYD21112612502.aprx112612502_LVIA008_VisualReceiverLocations



- Project components**
- Project footprint
 - Visual assessment study area
 - Existing substation
 - New and adjusted transmission line

- Existing environment**
- Gardens of Stone SCA
 - Watercourse
 - Railway
 - Roads

- Sensitive receivers**
- Public receivers
 - Private receivers

Rev: A
Date: 15/07/2025
1:40,000 @ A4

0 500 1,000
Metres
Grid: GDA2020 MGA Zone 56



ghd.com

→ **The Power of Commitment**