Environmental Impact Statement

SSD-10422 Proposed Brickworks Plant

416 and 524 Berrima Road, Moss Vale
(Lot 1 DP785111 and Lot 1 DP414246)

Prepared by Willowtree Planning Pty Ltd on behalf of Brickworks Land and Development

July 2020

A national town planning consultancy
www.willowtreeplanning.com.au

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EP&A REGULATION, SCHEDULE 2 PART 3 INFORMATION

Declaration Form	**Submission of Environmental Impact Statement** prepared under the *Environmental Planning and Assessment Act 1979* and the *Environmental Planning and Assessment Regulation 2000*
EIS Prepared By	
Name	Travis Lythall
Qualifications	Bachelor of Science, University of Newcastle (UoN)
Address	Suite 4, Level 7 100 Walker Street North Sydney NSW 2060
In Respect Of	Construction and operation of a 50 million brick per annum brickworks plant with 24-seven operations as State Significant Development
Development Application	
Applicant Name	Brickworks Land and Development
Address	738-780 Wallgrove Road, Horsley Park NSW 2175
Land to be Developed	416 and 524 Berrima Road, Moss Vale (Lot 1 DP 785111 and Lot 1 DP 414246).
EIS	An Environmental Impact Statement is attached.
Certificate	I certify that I have prepared the contents of this EIS and to the best of my knowledge: ▪ It is in accordance with Schedule 2 of the *Environmental Planning and Assessment Regulation 2000*; ▪ Contains all available information that is relevant to the environmental assessment of the development, activity or infrastructure to which the statement relates; and ▪ That the information contained in the statement is neither false nor misleading.
Signature	
Name	Travis Lythall
Qualification	Bachelor of Science, University of Newcastle (UoN)
Date	20 July 2020

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GLOSSARY OF TERMS

Term	Meaning
AHIP	Aboriginal Heritage Impact Permit
APZ	Asset Protection Zone
Austral Masonry	Austral Masonry (NSW) Pty Ltd
BAL	Bushfire Attack Level
BC Act	*Biodiversity Conservation Act 2016*
Council	Wingecarribee Shire Council
dB(A)	A-weighted decibel
DPIE	Department of Planning, Infrastructure and Environment
DPI	Department of Primary Industries
Drinking Catchment SEPP	*State Environmental Planning Policy (Sydney Drinking Water Catchment) 2011*
EEC	Endangered Ecological Community
EIS	Environmental Impact Statement
EPA	Environment Protection Authority
EP&A Act	*Environmental Planning and Assessment Act 1979*
EP&A Regulation	*Environmental Planning and Assessment Regulation 2000*
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
EPL	Environment Protection Licence
GDEs	Groundwater Dependent Ecosystems
L_{Aeq}	Equivalent continuous sound
MVECDCP 2008	*Moss Vale Enterprise Corridor Development Control Plan 2008*
NP&W Act	*National Parks and Wildlife Act 1974*
OEH	NSW Office of Environment and Heritage (now EES Group)
PBP	*Planning for Bushfire Protection 2019*
PCT	Plant Community Type
POEO Act	*Protection of the Environment Operations Act 1997*
Regional Plan	The *South East and Tablelands Regional Plan 2036*
Regional Strategy	The *Sydney-Canberra Corridor Regional Strategy 2006-2031*
RFS	Rural Fire Services
RMS	Roads and Maritime Services
SEARs	Secretary's Environmental Assessment Requirements issued on 11 February 2020
SEPP	State Environmental Planning Policy

Term	Meaning
The Site	The portion of 416 and 524 Berrima Road Moss Vale (Lot 1 DP785111 and Lot 1 DP414246) subject to the Proposed Development
SSD	State Significant Development
tpa	Tonnes per annum
Willowtree Planning	Willowtree Planning Pty Ltd
WLEP 2010	*Wingecarribee Local Environmental Plan 2010*

EXECUTIVE SUMMARY

Willowtree Planning Pty Ltd has prepared this Environmental Impact Statement (EIS) on behalf of Brickworks Land and Development. This EIS seeks Development Consent for the construction and operational use of a 50 million brick per annum Brickworks Plant with a proposed 24/7 operation and a Capital Investment Value (CIV) of approximately $80 Million.

The Proposed Development would take place at 416 and 524 Berrrima Road, Moss Vale (Lot 1 DP 785111 and Lot 1 DP 414246) within the Wingecarribee Local Government Area (LGA).

Pursuant to Schedule 1 of *State Environmental Planning Policy (State and Regional Development) 2011* (SRD SEPP), the Proposed Development satisfies the following trigger for State Significant Development (SSD):

- Clause 9 metal, mineral and extractive material processing with a CIV of more than $30 M for the purposes of brickworks.

The NSW Department of Planning, Industry and Environment (DPIE) issued State Significant Development number 10422 to the Proposed Development.

The Proposed Development would also trigger the requirement for an Environment Protection Licence (EPL) from the NSW Environment Protection Authority (EPA) under the *Protection of the Environment Operations Act 1997* (POEO Act) (being for the production of more than 15,000 tonnes of bricks per annum).

The Site is zoned IN1 General Industrial. The Proposed Development, for a general industrial land use, is therefore permitted with consent under the *Wingecarribee Local Environmental Plan 2010* (WLEP2010). The Proposed Development is also consistent with the objectives, provisions and strategies outlined within the *Sydney-Canberra Corridor Regional Strategy 2006-2031*, and the *South East and Tablelands Regional Plan 2036*. The Proposed Development would enable a land use which is in keeping with Wingecarribee Shire Council's strategic vision for the Site as an Enterprise Precinct under the Moss Vale Enterprise Corridor. Specifically, the Proposed Development would contribute to economic growth and prosperity in accordance with these policies by supporting private enterprise, thereby creating employment opportunities in a site earmarked for such future industrial development.

Overall, the Proposed Development is justified on the basis that it can support local employment by maintaining employment / industrial land stocks and local employment objectives, whilst promoting key local industries, and also generating more employment during the planning, construction, operation and maintenance stages.

This Environmental Impact Statement was prepared in accordance with the Secretary's Environmental Assessment Requirements (SEARs) and the Key Issues identified by the relevant agencies. The 14 Key Issues identified by the SEARs, which are assessed in this EIS include:

1. Strategic Context;
2. Air Quality;
3. Noise and Vibration;
4. Soil and Water;
5. Traffic and Transport;
6. Waste Management;
7. Hazards and Risk;
8. Biodiversity;
9. Greenhouse Gas;
10. Bushfire;
11. Visual;

12. Historic Heritage and Aboriginal Cultural Heritage;
13. Community and Stakeholder Engagement; and
14. Cumulative Impacts.

This EIS and its supporting technical reports have considered the above and conclude that the Proposed Development would not result in any significant environmental impacts. It is therefore recommended that the NSW DPIEs favourable consideration be given to the Proposed Development.

PART A PRELIMINARY

1.1 INTRODUCTION

Willowtree Planning Pty Ltd (Willowtree) has prepared this EIS on behalf of Brickworks Land and Development to support a SSD Application for the Proposed Development, to be submitted to the NSW DPIE to be determined under Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

This EIS seeks Development Consent for the construction and operational use of a 50 million brick per annum brickworks plant with 24/7 operations and a CIV of $80 M. The Proposed Development would take place at 416 and 524 Berrrima Road, Moss Vale (Lot 1 DP 785111 and Lot 1 DP 414246) within the Wingecarribee LGA.

The primary objective of the Proposed Development is to provide a new, state of the art Brickworks facility to supersede the operations of the currently outdated Bowral Brickworks Plant, allowing Brickworks Land and Development to continue to supply its premium "Bowral Blues" clay product.

Pursuant to Schedule 1 of the SRD SEPP, the Proposed Development satisfies the following trigger for State Significant Development:

- Clause 9 metal, mineral and extractive material processing with a CIV of more than $30M for the purposes of brickworks.

The NSW DPIE has issued SSD number 10422 to the Proposed Development.

The Proposed Development therefore requires an EIS to be prepared. Pursuant to Part 2 of Schedule 2 of the *Environmental Planning and Assessment Regulation 2000* (EP&A Regulation), the SEARs were issued by the NSW DPIE on 11 February 2020. These are included in **Appendix 1** of this EIS.

The Proposed Development would also trigger the issue of an EPL from the NSW EPA under the Schedule 1 of the POEO Act (being for the production of more than 15,000 tonnes of bricks per annum). The Proposed Development would therefore require the issue of an EPL from the NSW EPA.

The structure of this EIS is outlined as follows:

- Part A Preliminary;
- Part B Site Analysis;
- Part C Proposed Development;
- Part D Legislative and Policy Framework;
- Part E Consultation;
- Part F Environmental Risk Assessment;
- Part G Proposed Development Justification;
- Part H Management and Mitigation Measures; and
- Part I Conclusion.

1.2 THE PROPONENT

The Proponent is Brickworks Land and Development (refer to **Table 1** outlined below for contact details).

Table 1: Proponent Details	
Contact Name	Megan Kublins
Company Details	Brickworks Land and Development Mezzanine, 50 Carrington Street, Sydney NSW, 2000
Contact Number	02 9611 4201

1.3 PROPOSED DEVELOPMENT BACKGROUND

Bowral Bricks, a related company of Brickworks Land and Development, currently operates from a factory and a quarry located at Kiama Street, Bowral. The Bowral Brickmaking Plant has been occupied for over 95 years, with much of the onsite equipment and kilns now old and inefficient. Its quarry is also nearing exhaustion with only three to four years of reserves remaining.

The New Berrima Quarry, known as 'Mandurama Quarry' was purchased in 2008 as a replacement quarry for Bowral Bricks. The quarry has been approved and work has commenced on preparing the Site for full time production of material in stages, as the demand for quality building products and distribution is required.

Land at New Berrima, known as "Chesley Park" was purchased in 2013 to provide the option of relocating factories to this site from Bowral.

DA18/0576 was approved by Wingecarribee Shire Council on 30 September 2019 for a 220,000 tonne per annum (tpa) masonry plant with 24-seven operations in the western-most portion of Lot 1 DP785111 (refer to area outlined in green on **Figure 1** in **Section 2.1** below).

The Applicant now seeks approval for a new Brickmaking Plant which would be co-located with the masonry plant approved under DA18/0576 (refer to area shaded yellow on **Figure 1** in **Section 2.1** below). This Proposed Development seeks to replace the existing Bowral Brickmaking Plant, allowing those existing workers to continue working out of the Berrima site, and increasing the company's output by around 15 million bricks per annum, an increase to 50 million bricks per annum compared to the 35 million which are currently produced at the Bowral Brickmaking Plant. Most significantly, this would allow Brickworks Land and Development to continue to supply its premium "Bowral Blues" clay product.

PART B SITE ANALYSIS

2.1 SITE LOCATION AND EXISTING SITE CHARACTERISTICS

The Site is located at 416 and 524 Berrima Road, Moss Vale. It lies to the east of Berrima Road, Moss Vale, and comprises the eastern-most portion of Lot 1 DP 785111 and part of the existing access handle of Lot 1 DP 414246 which will be used for heavy vehicle access and egress to the brickworks plant as well as for raw materials transport from the New Berrima Quarry (refer to **Figure 1**). Lot 1 DP 785111 has been most recently used for agricultural and rural residential purposes, supporting the Chesley Park Pastoral Land homestead (refer to **Figure 1**). It comprises an area of 51.68 ha and currently contains paddocks and derived grasslands, scattered and landscaped mature trees, a storage dam, tributaries of Stony Creek, an internal access road and minor agricultural structures supporting the dominant use of cattle farming. There is an existing above ground water main traversing Lot 1 DP 785111 from the north-west and travelling in a curvature to the north-east (refer to purple easement outlined on **Figure 1**). Topographically, Lot 1 DP 785111 is relatively flat.

Lot 1 DP 785111 is zoned IN1 General Industry pursuant to WLEP2010. It is generally bound by the following (refer to **Figure 1**):

- Berrima Road and existing rural residential land users to the west, zoned IN1;
- Agricultural land users to the east, zoned IN1;
- An existing quarry access road and the historic target club (previously used as a military training range during WWI and WWII), zoned E2 Environmental Conservation and E3 Environmental Management; and
- Berrima Road, Blue Circle rail line and other rural land uses to the south, zoned IN1.

Lot 1 DP 414246 is zoned E3 Environmental Management pursuant to WLEP2010, where Roads are permitted with consent (refer to **Table 5** in **Section 4.2** below).

DA18/0576 was approved by Wingecarribee Shire Council on 30 September 2019 for a 220,000 tonne per annum (tpa) masonry plant with 24-seven operations in the western-most portion of Lot 1 DP 785111, again with proposed road access via Lot 1 DP 414246 (refer to area outlined in green on **Figure 1**).

There is also an existing Boral Cement Works (Blue Circle Cement) located around 290 m south-west of Lot 1 DP 785111, at Perth Street New Berrima (refer to **Figure 1**).

The Site of the Proposed Development is located wholly within the bounds of Lot 1 DP 785111 and Lot 1 DP 414246 (refer to yellow outlined area on **Figure 1**). Lot 1 DP 414246 contains the existing quarry road which will be utilised in part for heavy vehicle access to the brickworks site.

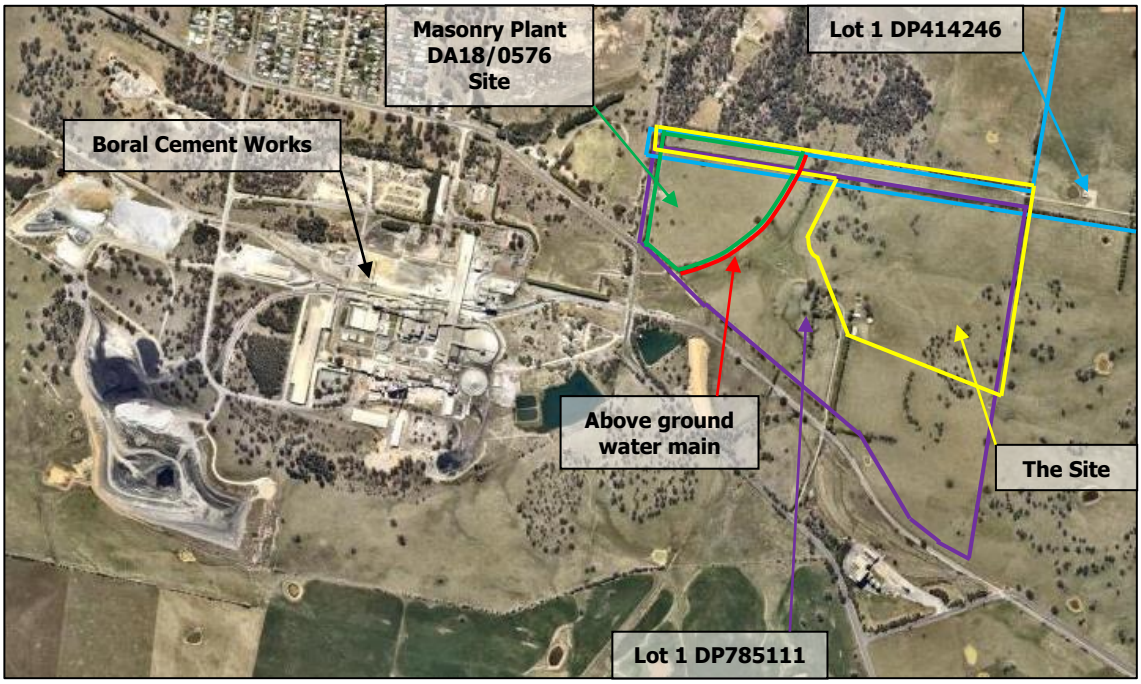

Figure 1 The Site and Surrounds (Source: Nearmaps, 2020)

Figure 2 contains a cadastral view of Lot 1 DP 785111.

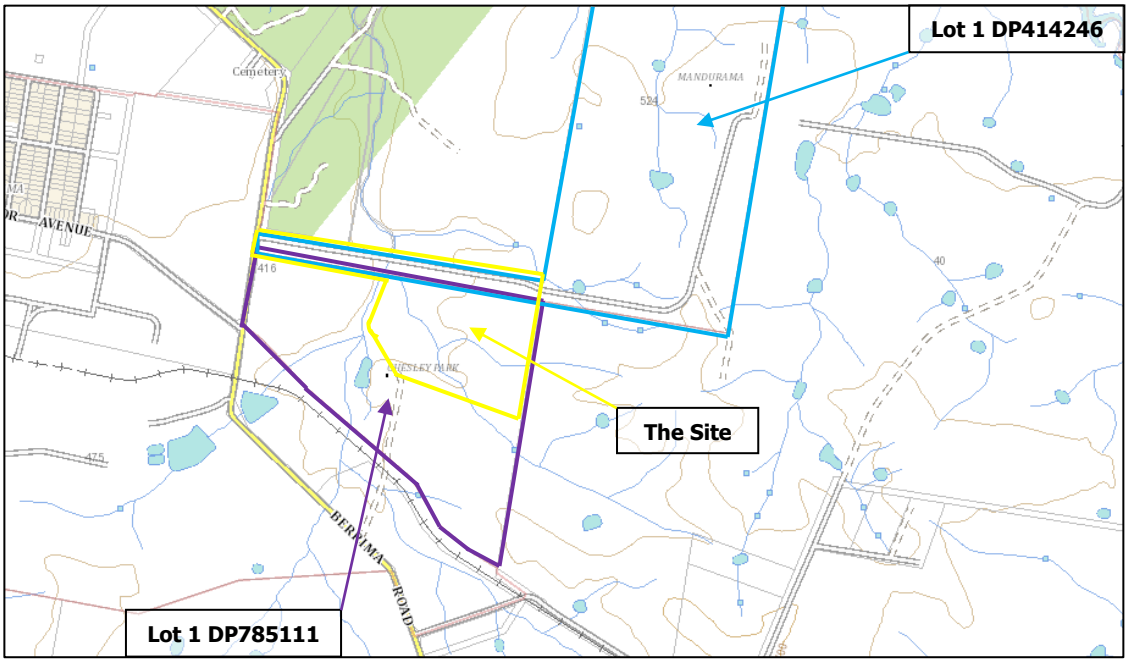

Figure 2 Cadastral View of Lot 1 DP785111 and Lot 1 DP 414246 (Source: SIX Maps, 2020)

Lot 1 DP 785111's only street frontage is Berrima Road along its western boundary. Site access to Lot 1 DP 785111 is currently obtained from Berrima Road to the south. This is via a right of carriageway over the southern adjoining site owned by Boral, and requires a level crossing of the Blue Circle rail line.

The topography of the area where the Proposed Development would take place generally falls from the northwest corner at Berrima Road (RL 678m) southeast towards the Stony Creek riparian corridor (RL 658m), at an average gradient of approximately 5%. Closer to the creek, the gradient increases up to 10% in some places. On the wider parent site, the

land falls from higher ground at the eastern boundary (RL 675-678) back west into the central creek corridor.

Portions of Lot 1 DP 785111 and Lot 1 DP 414246 contain mapped riparian lands and watercourses under the WLEP2010 (refer to **Figure 3** below).

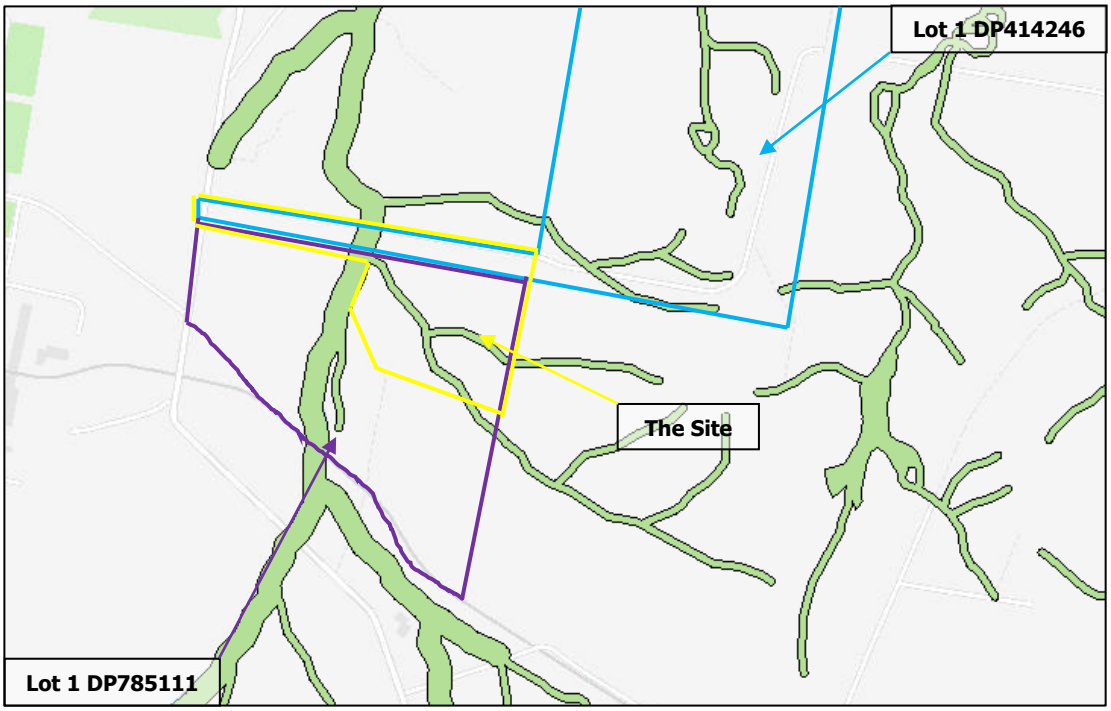

Figure 3 Riparian Lands and Watercourses (Source: NSW Planning Portal, 2020)

Figure 4 below provides a Site Plan and Site Analysis Plan of the Proposed Development. This indicates the paths of both morning and afternoon sun at the Site, the direction of south-west winter winds and north-east summer winds, existing trees and riparian areas, existing stormwater basin, as well as infrastructure to be demolished and built at the Site as part of the Proposed Development.

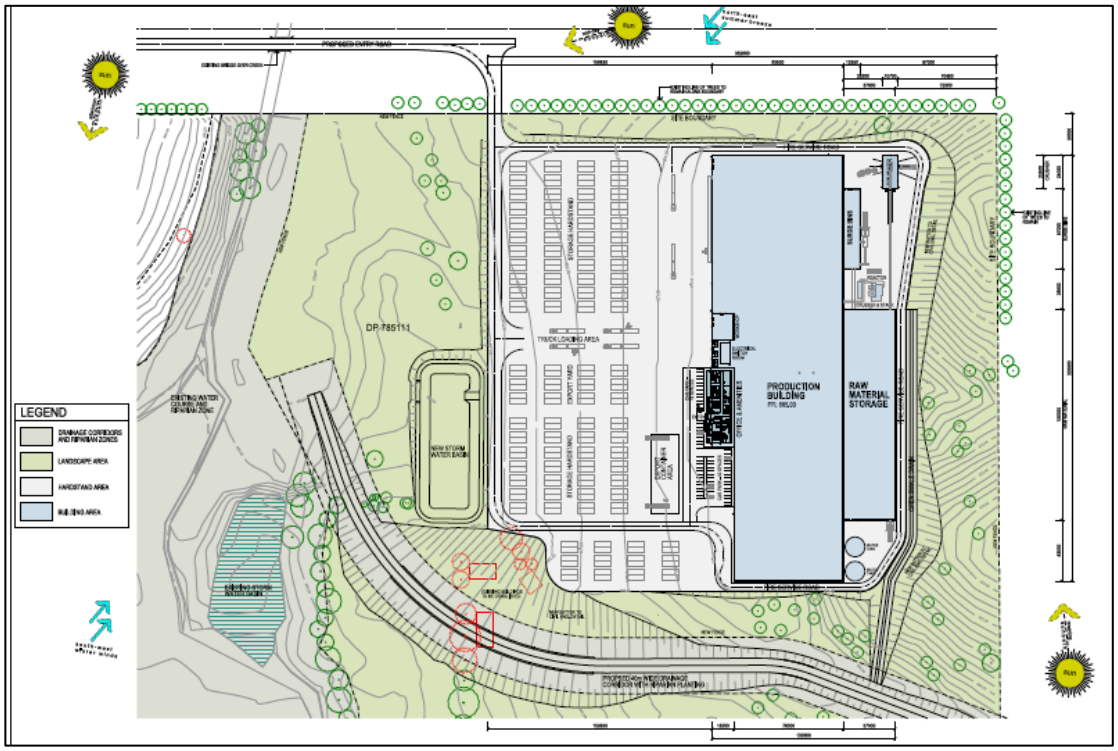

Figure 4 Site Plan and Site Analysis Plan (Source: SBA Architects, 2020)

2.2 LAND OWNERSHIP

The land is owned by the Austral Brick Co Pty Ltd (ABN 000 550), which is a wholly owned subsidiary of Brickworks Limited. Brickworks Limited is publicly listed on the ASX.

2.3 SITE CONTEXT

The Site lies within the suburb of Moss Vale in the Wingecarribee LGA. It is around 6.8 km south-west of Bowral and around 50.8 km west of Wollongong. It is mapped within the Wingecarribee River sub-catchment of the Sydney Drinking Water Catchment under *State Environmental Planning Policy (Sydney Drinking Water Catchment) 2011* (Drinking Catchment SEPP) (refer to **Figure 5** below).

Lot 1 DP 785111 also falls within a mapped Enterprise Corridor (refer to **Section 4.4.3**) under the *Moss Vale Enterprise Corridor Development Control Plan 2008* (MVECDCP2008). Lot 1 DP 785111 is mapped as being within the General Industrial Precinct under the MVECDCP2008.

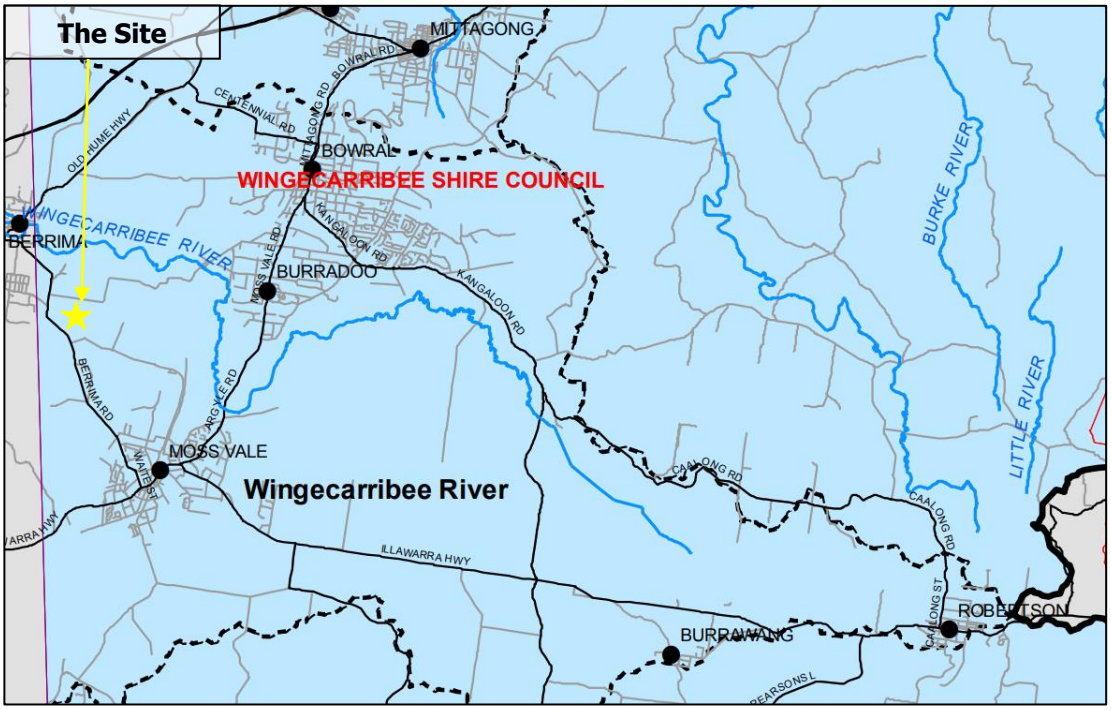

Figure 5 Sydney Drinking Water Catchment Mapping (Source: NSW Legislation, 2020)

2.4 SURROUNDING DEVELOPMENTS

2.4.1 Austral Masonry Plant

As mentioned above, **DA18/0576** was approved by Wingecarribee Shire Council on 27 September 2019 for *earthworks and construction and operation of a Masonry Plant* in the western-most portion of Lot 1 DP 785111, again with proposed road access via Lot 1 DP 414246 (refer to area outlined in green on **Figure 1** above). **DA18/0576** comprised a Designated Development Application pursuant to Part 1, Schedule 3, Clause 14(a) of the EP&A Regulation, which included the following scope of works:

- Masonry Plant with a 220,000 tpa capacity.
- Products to be manufactured at the site would include grey block masonry, coloured block, retaining walls and pavers.
- The estimated cost of works was approximately $26 Million.

The Proposed Development, the subject of this SSD Application would be co-located to the Masonry Plant approved under **DA18/0576**.

2.4.2 Berrima Coal Mine

It is noted, that Hume Coal Pty Limited is currently progressing two State Significant Development (SSD) Applications. SSD 15_7172 seeks consent for the development of a new underground coal mine and associated infrastructure to support mining operations (i.e. the Hume Coal Project). The proposed underground mine would be located around 3.5 km west of the Site. SSD 15_7171 seeks an extension to the Berrima Branch Line to support the Hume Coal Project. This would connect the proposed Hume Coal Mine to the Main Southern Railway. SSD 15_7171 would affect the configuration of the rail line as it passes by the south of Lot 1 DP 785111. This configuration has also taken into account the proposed Berrima Road Relocation works which are currently proposed on behalf of Wingecarribee Shire Council (refer to **Figure 6** below).

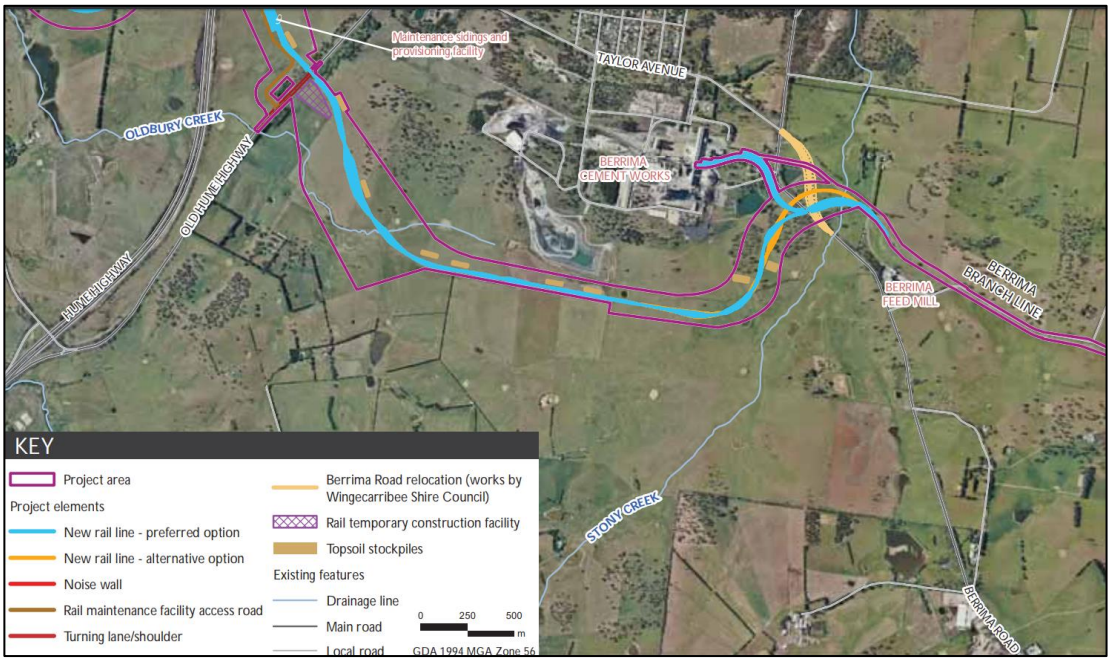

Figure 6 Conceptual Project Components for SSD 15_7171 (Source: EMM, 2017)

2.4.3 New Berrima Clay/Shale Quarry

The Austral Brick Company Pty Limited received Development Consent for its New Berrima Clay / Shale Quarry under the former Part 3A of the EP&A Act on 9 July 2012 (Part 3A No 08_0212). The location of this site is shown in **Figure 7**. On 15 December 2015, the NSW DPIE approved Modification 1 to 08_0212, and on 6 July 2017 the NSW DPIE approved Modification 2 to 08_0212.

In summary, the New Berrima Clay / Shale Quarry is located to the immediate north of the Site.

Modification 1 approved:

- Relocation of the extraction area to a location within the clay/shale resource boundary providing access to higher quality materials than the approved extraction area;
- Construction of appropriately located visual barriers (constructed progressively); and
- Relocation and replacement of surface water management/sedimentation dams and related water direction structures.

Modification 2 approved:

- The construction of a new causeway over Stony Creek;
- Realignment of the western access road;
- Repositioning of the Site office, amenities, and storage container; and
- Installation of underground power and removal of a section of overhead power line.

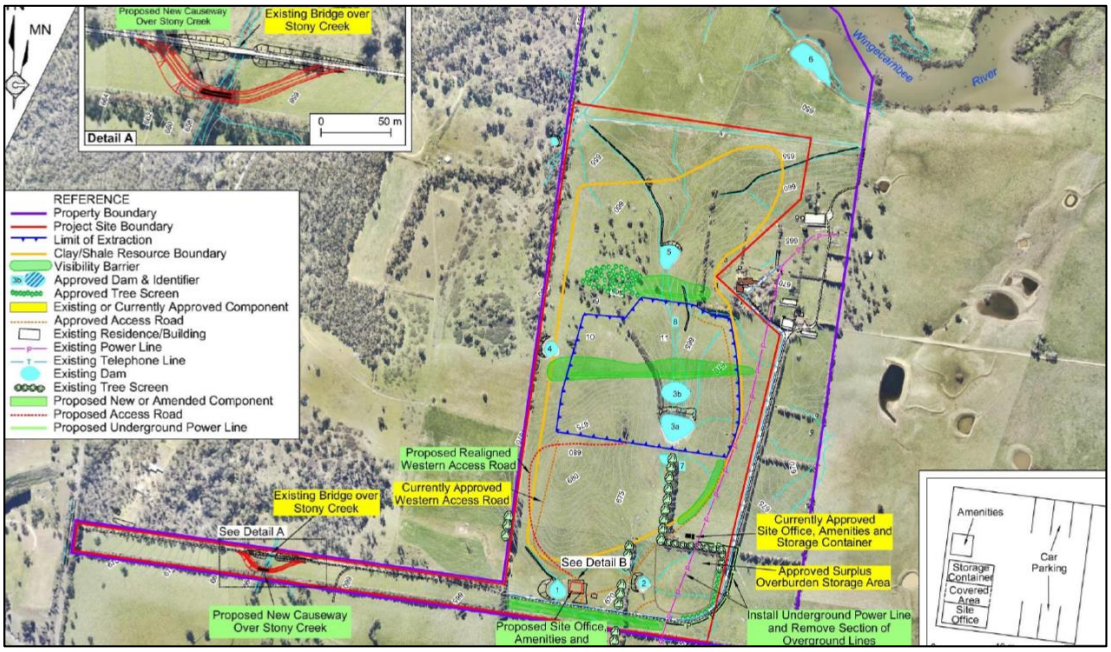

Figure 7 Proposed Modifications (MOD 2): New Berrima Clay/Shale Quarry (Source: The Austral Brick Company, 2016)

2.4.4 Berrima Cement Works

Boral Land and Property Group obtained consent for Modification 11 to its DA401-11-2002 on 25 October 2019. This site is located to the immediate west of Lot 1 DP 785111.

Modification 12 is currently being assessed for an Isotainer Loading Operations Modification. Modification 12 seeks consent for the following:

- Loading, unloading, storage and filling of isotainer containers on the land, for the purposes of transporting cement; and
- Sundry improvements to the proposed storage area, and internal truck route on the Site to facilitate the filling of isotainers from the existing and currently operating filling station.

Figure 8 below shows the location of the works proposed under Modification 12, in context of Brickworks Land and Development's nearby site, which is located around 1.3 km east of the Boral site.

Figure 8 Berrima Cement Works Site Plan (Source: Boral, 2019)

The approval history of the Boral Facility is outlined in **Table 2** below.

Table 2 Boral Cement Works Modification Summary

Date	Mod No.	Reference	Particulars
26 September 2005	1	MOD 2-1-2004	Use of non-standard fuels
22 September 2006	2	MOD 109-9-2006	Removal of hazardous waste prohibition
13 February 2007	3	MOD 12-2-2007	Trial use of tyre chips
24 April 2008	4	MOD 4	Varying usage of coke fines
31 August 2009	5	MOD 5	Coal deliveries by rail
20 June 2012	6	MOD 6	Stockpiling of coal for sale and transport
16 April 2012	7	MOD 7	Trial and use of blast furnace slag
5 August 2012	8	MOD 8	Administrative changes to align DA and EPL
5 October 2016	9	MOD 9	Receipt and use of up to 100,000 tpa of SWDFs
11 April 2019	10	MOD 10	Modification to SWDF storage shed dimensions
25 October 2019	11	DA401-11-2002-I-Mod-11	HiCal50 Modification for Startup/Shutdown

2.5 SITE SUITABILITY

The Proposed Development comprises the construction and operational use of a 50 million brick per annum brickworks plant with 24/7 operations. In summary, the suitability of the Proposed Development at the Site can be attributed to the following:

- The Proposed Development would enable a land use which is permitted under the Site's IN1 General Industrial zoning which came into force under the WLEP2010;
- The Proposed Development would enable a land use which is in keeping with Wingecarribee Shire Council's strategic vision for the Site as an Enterprise Precinct under the Moss Vale Enterprise Corridor; and
- As outlined in **Table 5** in **Section 4.3** the Site is suitable for the Proposed Development as per the requirements of *State Environmental Planning Policy No 55 – Remediation of Land* (SEPP 55).

PART C PROPOSED DEVELOPMENT

3.1 OBJECTIVES OF THE PROPOSED DEVELOPMENT

The primary objective of the Proposed Development is to provide a new, state of the art Brickworks Facility to supersede the operations of the currently outdated Bowral Brickworks Plant, allowing Brickworks Land and Development to continue to supply its premium "Bowral Blues" clay product. Other objectives include:

- Make use of an underutilised industrial zoned site for suitable industrial purposes;
- Generate employment within the locality of Moss Vale;
- Meet the objectives of the IN1 General Industrial zone under the WLEP2010;
- Support future developments within the region by providing a local source of manufactured masonry;
- Meet the strategic planning aims for Enterprise Precincts under the MVECDCP2008 with regards to the Site forming the western gateway to the Moss Vale Enterprise Corridor;
- Avoid impacts to other areas of Lot 1 DP 785111 which are potentially constrained due to matters of Aboriginal Cultural Heritage, biodiversity and riparian health; and
- Create minimal operational environmental impacts with regards to noise and vibration emissions, as well as air and water quality.

Overall, the Proposed Development is justified on the basis that it can support local employment by maintaining employment / industrial land stocks and local employment objectives, whilst promoting key local industries, and also generating more employment during the planning, construction, operation and maintenance stages of the project's life cycle.

3.2 DESCRIPTION OF THE PROPOSED DEVELOPMENT

The Proposed Development would involve the construction and operational use of a 50 million brick per annum plant with 24/7 operations (refer to **Figure 9** below). This represents an increase of 15 mtpa from the currently outdated Bowral plant, which the Proposed Development would serve to replace. The plant at the Site would operate as a dry press brick plant with a tunnel kiln, producing premium dry pressed brick products including "Bowral Blues" (a premium product requiring high oxygen and high gas firing via a tunnel kiln).

It is noted that, to reduce potential noise amenity impacts, forklifts are only proposed to operate in the yard between the hours of 6am and 9pm.

The Proposed Development would have a CIV of around $80M. A full set of Architectural Plans are provided in **Appendix 4**.

Figure 9 shows the location of the proposed new production building within Lot 1 DP 785111

Figure 9 Proposed Location Plan (Source: SBA Architects, 2020)

The Proposed Development includes those works as outlined in **Table 3** below.

Table 3 Proposed Development Statistics	
Component	**Proposed**
Site Area	178,658 m^2
Building Type / Primary Land Use	Industrial – Brick Manufacturing Facility
Gross Floor Area	**Total GFA: 33,545 m^2** ▪ Production Building: 26,145 m^2; ▪ Office: 895 m^2; ▪ Raw Materials Storage: 5,550 m^2; ▪ Surge Bins: 705 m^2; ▪ Crusher: 250 m^2
Floor Space Ratio	0.19:1
Building Height	Maximum building height: 35 m. ▪ 20 m for the proposed building. ▪ 35 m for the proposed kiln stacks.
Landscaping	84,214 m^2
Earthworks	Earthworks on the Site are proposed as follows: ▪ Bulk earthworks are proposed to be carried out across the Site to establish pads for the built form components.
Roads / Driveways	▪ The access road off Berrima Road would service the Site.
Infrastructure and Servicing	All services to the Site are able to be provided and augmented from Berrima Road to the Site, including potable water; electricity; gas; wastewater; and telecommunications.

Access	The new plant would be accessed via Lot 1 DP 414246, which would be used for heavy vehicle access and egress as well as for raw materials transport from the New Berrima Quarry.
Car Parking	59 car parking spaces (including provisions for one (1) accessible space).
Hours of Operations	24/7 operations
Cost of works	$70,273,721 (excluding GST)

Figure 10 shows the proposed overall floor plan of the Proposed Development, including the following components:

- Production building;
- Crusher;
- Surge bins;
- Scrubber and stack;
- Reactor;
- Raw material storage;
- Open swale drain;
- Fire service road;
- New engineered batters;
- Water tanks;
- Two car parking areas providing a total of 59 spaces;
- Export container area;
- Office and amenities;
- Electrical switchroom;
- Workshop;
- Supporting hardstand and landscaped areas; and
- Open swale drain.

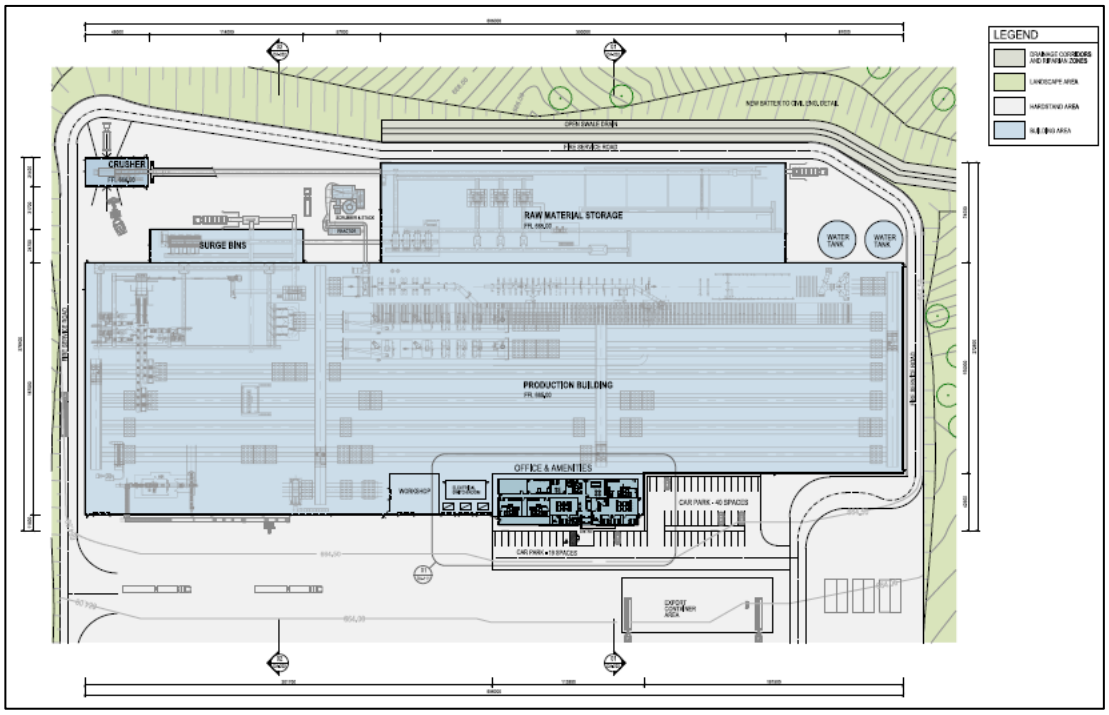

Figure 10 Proposed Development Overall Floorplan (Source: SBA Architects, 2020)

Figure 11 provides overall elevations of the Proposed Development. This includes the following components:

- Bowral Bricks logo on the proposed eastern and western elevations;
- Schedule of external finishes including:
    - Profiled metal wall cladding, eaves and downpipes in Colorbond Monument;
    - Profiled metal wall cladding in Colorbond Shale Grey;
    - Profiled metal roof sheeting in Colorbond Surfmist;
    - Roller shutters in unpainted galvanised steel;
    - Door frames painted charcoal, leaf painted Colorbind Windspray;
    - Windows and frames in powdercoat charcoal, glass and louvres in medium grey;
    - Face brickwork with Bowral Bricks in dark colour tones – running bond;
    - Face brickwork with Bowral Bricks in dark colour tones in Hit & Miss Screen Bond or the same pater with black brick inserts;
    - Face brickwork with Bowral Bricks in light colour tones and stack bond; and
    - Steel canopy and sunblades in orange to match Bowral logo colour.

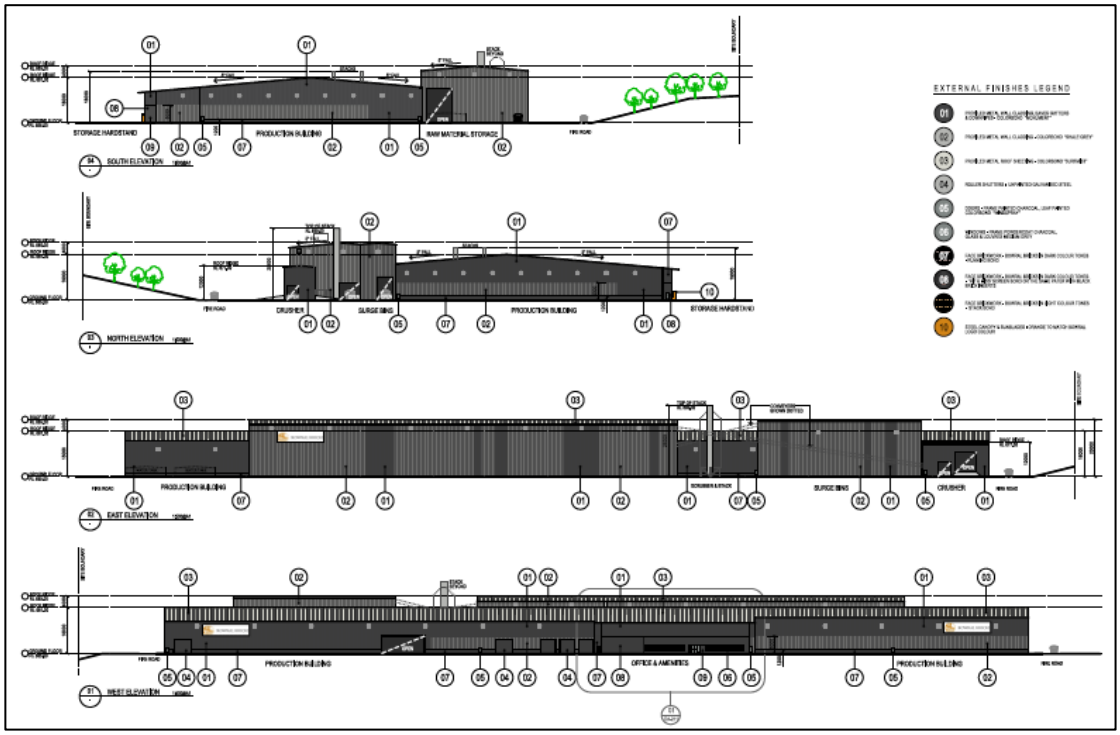

Figure 11 Proposed Overall Elevations (Source: SBA Architects, 2020)

Figure 12 shows the proposed overall cross sections of the development.

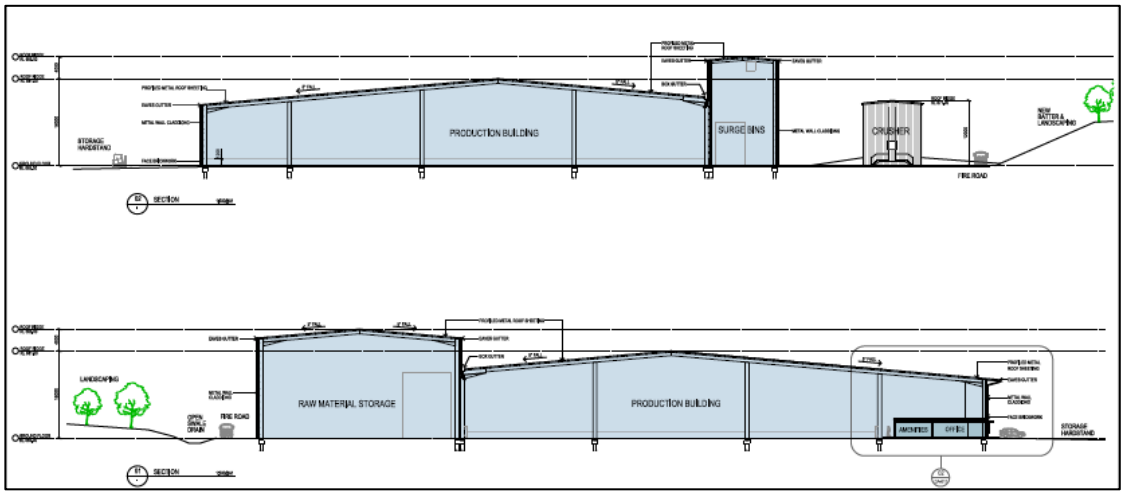

Figure 12 Proposed Overall Cross Sections (Source: SBA Architects, 2020)

3.2.1 Raw Materials

A raw materials area would be located to the west of the proposed factory building. These raw materials would be delivered to the Site from the New Berrima quarry. Raw materials delivered to the Site would be crushed and ground onsite before being stored onsite in raw materials bunkers prior to processing. Raw materials would be delivered by two (2) x 740 Caterpillar Dump Trucks (40 Tonne) to cart the raw materials from the quarry, directly to stockpile locations via internal access roads. The stockpile locations would be situated on the area pertaining to the Site's Mining Lease along the north-eastern boundary of the proposed factory building.

The raw materials extracted from the New Berrima quarry would include the following estimated quantities:

- New Bowral factory production is 50 million SBE's per year.
- Bowral Dry Pressed brick weight is 4.4 kg.
- 220,000 Tonnes of Shale required.
- Current Sales Mix requires:
    - 200,000 Tonnes of Ashfield Shale from the New Berrima Quarry - 3,900 Tonnes Per Week.
    - 20,000 Tonnes of Shale from the Austral Satellite Quarries – 384 Tonnes per Week.

3.2.2 Factory Building

The proposed factory building would comprise a floorspace of around 36,800 m^2 (230m x 160m). It would be constructed using standard industrial construction techniques. Details on the equipment foundations would be provided by the kiln manufacturer and installed by a contractor. A standard slab would be laid over the Site foundations.

The factory amenities would be constructed to be suitable for around 12 members of staff at any one time. It is proposed to have staff work two separate shifts over the 24 hour period. The factory would therefore also include amenities suitable to cater for 12 member of staff at any one time, including a lunchroom, factory manager's office and a control room.

From an operational standpoint, once bricks are formed, dried and fired in the factory, they would be removed from kilns and strapped, ready for storage.

3.2.3 Office

An office would be constructed, suitable for around ten (10) staff members, including four (4) administrative staff, four (4) sales representatives and two (2) plant managers.

Figure 13 sets out the proposed layout for this proposed office and amenities area at the Site. This includes the following components:

- Laboratory;
- First aid room;
- Offices;
- Bathroom areas;
- Lunchroom;
- Locker rooms and showers;
- Meeting rooms;
- Store rooms;
- Air lock;
- New kerb/footpath;
- External vertical sunblades; and
- Cleaning storage area.

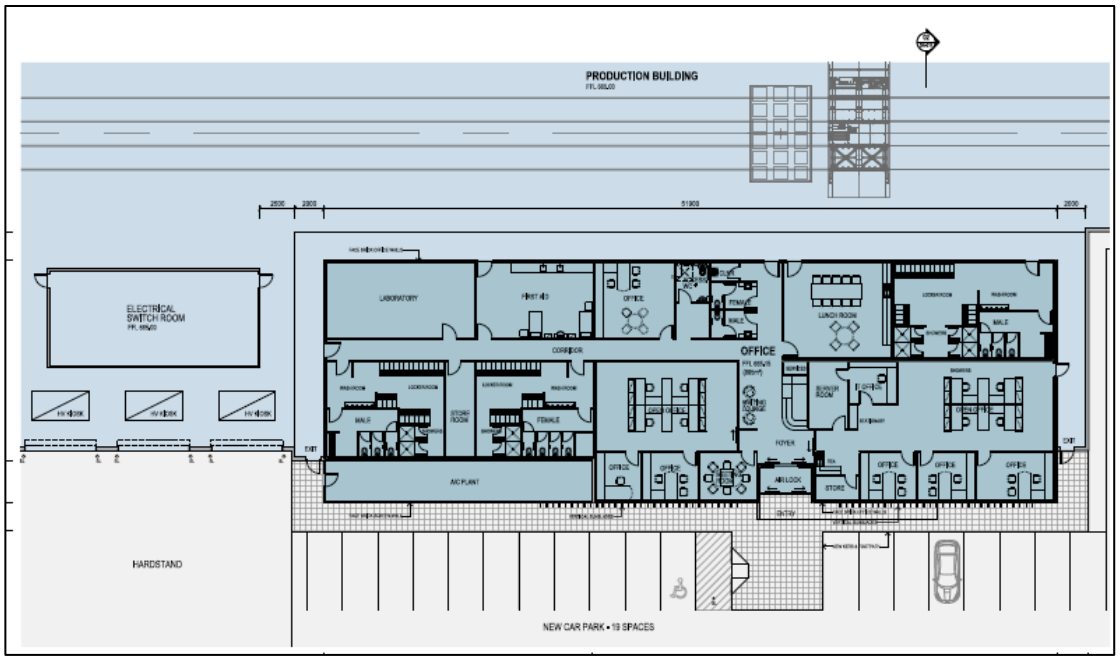

Figure 13 Office and Amenities Floorplan (Source: SBA Architects, 2020)

Figure 14 below shows the proposed elevations and sections of this office area. This includes the following components:

- Metal roof sheeting;
- Eaves guttering;
- Metal wall cladding;
- Face brickwork;
- Steel canopy;
- Vertical sunblades;
- Schedule of external finishes including:
    - Profiled metal wall cladding, eaves and downpipes in Colorbond Monument;
    - Profiled metal wall cladding in Colorbond Shale Grey;
    - Profiled metal roof sheeting in Colorbond Surfmist;
    - Roller shutters in unpainted galvanised steel;

- Door frames painted charcoal, leaf painted Colorbind Windspray;
- Windows and frames in powdercoat charcoal, glass and louvres in medium grey;
- Face brickwork with Bowral Bricks in dark colour tones in Hit & Miss Screen Bond or the same pater with black brick inserts;
- Face brickwork with Bowral Bricks in light colour tones and stack bond; and
- Steel canopy and sunblades in orange to match Bowral logo colour.

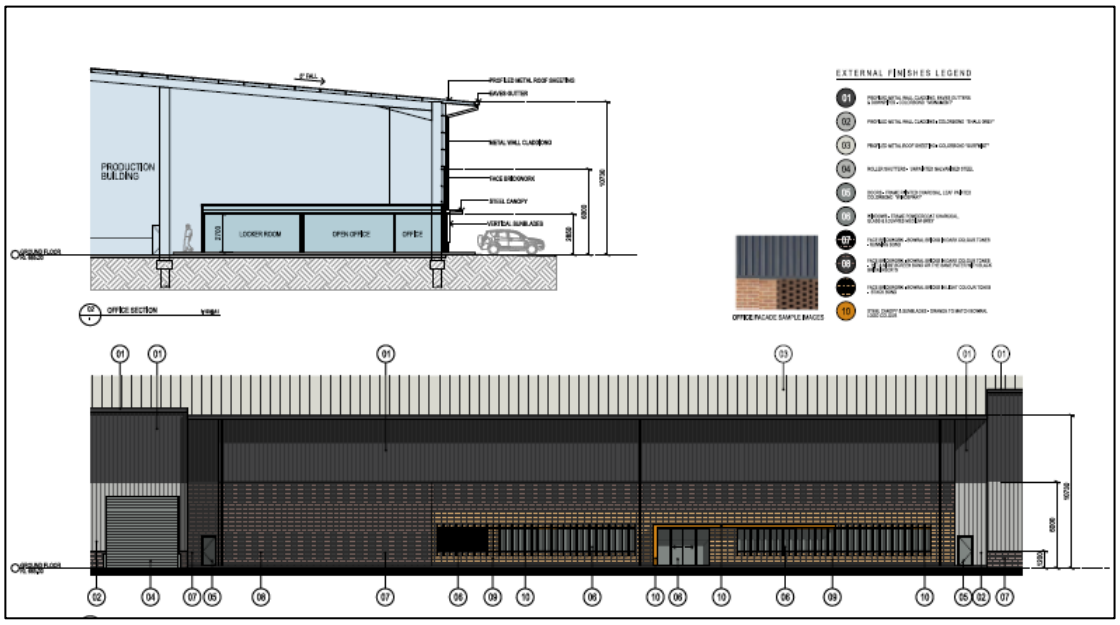

Figure 14 Proposed Office Elevation and Section (Source: SBA Architect, 2020)

3.2.4 Laboratory

A laboratory would be provided, most likely near to the factory staff amenities and suitable for use by around two (2) staff members.

3.2.5 Access and Servicing

The new plant would be accessed via Lot 1 DP 414246, which would be used for heavy vehicle access and egress as well as for raw materials transport from the New Berrima Quarry.

The carpark would provide 36 staff parking spaces, two (2) visitor spaces and accessible parking spaces (with 59 car parking spaces in total). The Site is expected to generate around 85 trucks accessing the Site per day, including around 50-60 product trucks, 10-15 trucks picking up materials from the external storage yard, and around 5-10 courier/deliveries per day. At this stage, it is estimated that around 30% of all trucks accessing the Site would be B-Doubles. The majority of truck movements to and from the Site would occur between the hours of 5am and 5pm.

3.2.6 Production Process

The production process for brickmaking on the Site is depicted in **Figure 15** below and described further below, comprising five separate stages.

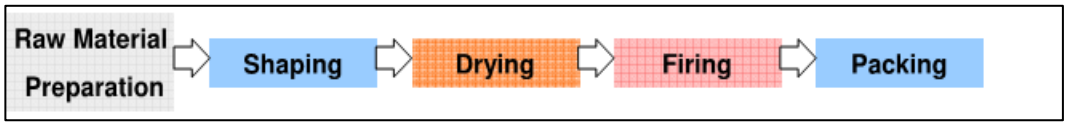

Figure 15 Proposed Production Process (Source: Brickworks Land and Development, 2019)

Stage One - Raw material preparation

Extraction

Heavy earthmoving equipment such as bulldozers, scrapers and mechanical shovels are used to extract clays and shales. The quarry located adjacent to the Subject Site approved under MP08_0212 is where the materials for Brickmaking will be primarily sourced from.

Crushing and proportioning

Raw materials are transported from the pit by scraper or truck stockpiled by type and fed into primary crushers to reduce the particle size to about 10 cm. Various clays are then mixed, depending upon the properties required in the brick.

The types of clay(s) utilised in the production process are primarily resultant from selective shale products, alternatively referred to as white-burning shale, or structural clay (in general terms).

Grinding and screening

Conveyors carry the material for secondary crushing by a pan mill with two heavy steel wheels that crush the clay against a perforated base. Dry clay shatters into brittle pieces that fall through the perforations. Wet clay is squeezed through the perforations and falls between high-speed rollers to complete the grinding process. The crushed clay is screened and oversize pieces returned for further crushing.

Stage Two - Shaping

Semi-dry pressed bricks

Semi-dry pressed bricks are made from clay with about 10 to 12 percent water content. The powder is dry enough to fall under its own weight into the steel mould (or die box) in which it is then compressed into the finished brick shape. The resulting brick is smooth and straight with sharp arises (edges) and a frog (shallow depression) in the top surface.

Stage Three - Drying

Before bricks are fired the free water must be removed by forced drying as air drying takes up to three months and is impractical with modern production volumes.

Pressed bricks

Pressed bricks are set onto kiln cars and dried by a small fire or by hot exhaust gases from an adjacent kiln.

Stage Four - Firing in a Tunnel Kiln

Bricks are fired (baked) at temperatures between 1000°C and 1200°C depending on the clay. Light colours are usually fired at the lower temperature and darker colours at the higher. They are fuelled by natural gas. A tunnel kiln is continuous, with the bricks moving

on kiln cars past stationary fires. Spent combustion gases preheat unfired bricks and airflow over cooling bricks is used to dry green bricks.

Stage Five - Packing

A vertical layer of 50 to 60 bricks may be strapped (banded) into a 'leaf' that is strapped with three or four other leaves into a 'pack' for transport. Most commonly, delivery to the building site is made by a truck carrying a crane or a special-purpose fork-lift vehicle that can enter difficult sites and place bricks or pavers strategically around the Site.

3.2.7 Servicing Requirements

The *Soil and Water Management Plan & Civil Servicing Report* (at&l, 2020) considered the proposed servicing needs of the Proposed Development (refer to **Appendix 8**).

Water

There is no existing water supply to the Proposed Development. A new water connection would be made to the existing water infrastructure located at the intersection of Berrima Road and Taylor Avenue, approximately 400 m south of the entrance driveway into the Site. According to Council records, the existing water main in this location is a 100 mm diameter AC pipe.

Wingecarribee Shire Council engineers are currently undertaking hydraulic modelling on behalf of Austral Masonry in order to confirm the available capacity of the public water infrastructure network, proposed connection size and location.

Sewerage

There is no existing sewerage connection to the Site. A new pressurised sewer rising main would be installed to the existing public sewer pump station in Adelaide Street, New Berrima. The alignment would run approximately 950m along the Berrima Road and Taylor Avenue road verges at a standard cover. Sewerage from the development would be pumped along the new main by a proprietary package pump station to be installed on the Site, collecting flows from the internal sanitary drainage.

Electricity

There is no existing electricity connection to the Site. The Proposed Development would take a new high voltage feed off the existing electrical infrastructure at the Berrima Road / Taylor Avenue intersection, for which a new 11 kV feeder will be required from the existing Berrima Junction Zone Substation, located on Douglas Road, approximately 2 km southeast of the Subject Site. This connection is likely to involve a combination of underground ducts and overhead lines across various lengths.

Telecommunications

There are no existing telecommunications connections to the Site. The Proposed Development would connect into the existing Telstra and / or NBN infrastructure located in the western road verge of Berrima Road. A new joint pit is likely to be required. Further discussions would be carried out with Telstra to confirm the exact connection point during the detailed design stage.

Gas

There is no existing gas connection to the Site. The Proposed Development would be serviced with gas via a new medium pressure connection into the existing Jemena gas

infrastructure located to the south of the Site on Berrima Road (serving the Boral Cement works). Further discussions would be carried out with Jemena to confirm the details of the network extension.

3.2.8 Vegetation Clearing

As set out in **Table 27** within **Section 6.6** below, the Proposed Development would require the removal of 2.06 ha of vegetation, comprising 2 ha of Plant Community Type 944 (Mountain Grey Gum - Narrow-leaved Peppermint grassy woodland on shales of the Southern Highlands, southern Sydney Basin Bioregion) and 0.06 ha of Plant Community Type 731 Broad-leaved Peppermint - Red Stringybark grassy open forest on undulating hills, South Eastern Highlands Bioregion. This would include 24 individual *Eucalyptus macarthurii* (Camden Woollybutt) trees.

Section 6.6 and **Appendix 6** contain further, detailed assessment of this vegetation clearing which would enable the Proposed Development to proceed.

3.3 NEED FOR THE PROPOSED DEVELOPMENT

Austral Bricks existing Bowral Brickworks Plant has operated for some time, being a steady source of local employment. Modern technology and automation have seen labour productivity rise, with the Bowral Brickworks Plant's current operation employing around 35 direct equivalent full time jobs. This includes a high proportion of skilled workers.

The current Bowral Brickworks Plant produces around 35 million bricks per annum, with output at around one million bricks per worker. Typically, modern brick plants will produce around 50 million bricks per annum, suggesting that a new, larger plant offers scope for increased efficiency and lower cost. The proposed relocation to Berrima presents an opportunity to upgrade the facility, which will have the capacity to produce 50 million bricks per annum.

The Site of the Proposed Development also benefits from the following features not available at the current Bowral Brickmaking Plant site:

- Less site restraints when compared to the Bowral Brickmaking Plant, meaning that adequate expansion and increased productivity of around 35 million bricks per annum to 50 million bricks per annum could be realised;
- Direct access to clays sourced from the Berrima Quarry, as the Bowral Brickmaking Plant's clay sources will be exhausted by 2022;
- Removing the need to truck clay sourced from the Berrima Quarry into the existing Bowral Brickmaking Plant;
- Access to Hume Highway and supporting arterial road network without having to pass through the Berrima township, or through Bowral and Mittagong, reducing the potential for residential amenity impacts; and
- Reducing travel times from site to the arterial road network from 12 minutes to four minutes, thereby reducing shipping costs and impacts to other land users along local roads.

The Proposed Development is essential if the Site is to change from its existing state as an underutilised, surplus rural landholding to a productive and employment-generating industrial operation supporting future development within the region by providing a local source of manufactured masonry.

As the Berrima Plant site and the existing Bowral Brickmaking Plant are only located around 17 minutes' drive from each other, it is envisaged that the same workforce participants would continue to work at the Berrima Plant site. The increased job certainty provided for the workers of the current Bowral Brickmaking Plant workers would be a significant benefit of the Proposed Development. Moreover, the higher output volume at the Berrima Plant

site would mean more jobs created in shipping products to market, leading to some increase in local jobs. Overall, it is considered that the Proposed Development would directly and indirectly support around 78 jobs, representing a net increase of 10 jobs. The Proposed Development can therefore be considered to create a a superior employment outcome for the Wingecarribee Shire.

The Proposed Development would also generate a number of social and economic benefits, including:

- The Proposed Development is estimated to generate an industry value-added, incorporating its direct and indirect jobs generation, of more than $6 million per annum. If relocation of the Bowral Brickworks Plant to Berrima were not to proceed, the higher cost of production (i.e. older plant with higher transport costs) could threaten the long-term viability of its operations, resulting in job losses;
- The Proposed Development would allow processing to be undertaken on the future quarry at Berrima. That is, from a shipping perspective, there is also a cost advantage as well as a significant amenity advantage stemming from the removal of large trucks out of residential areas. Moreover, the subject at New Berrima is more accessible to highway traffic which would effectively bring down transport cost;
- Relocation of the Bowral Brickworks to Berrima would increase the revenue for Wingecarribee Shire Council, as higher rates apply to industrial land. Based on a land value of $3,860,000, this would generate an estimated $58,738 per annum. In addition, the potential increase in intensity of use of the existing Bowral Brickmaking Plant for a higher order use could furthermore increase the value of that land, moreover increasing revenue for Wingecarribee Shire;
- The Proposed Development would involve the use of agricultural land, which is currently exempt from land taxes. However, once the Site is used for industrial purposes, it would generate land taxes for the NSW Government (an estimated $49,304 per annum based on land value of $3,860,000);
- The expanded operations at the Berrima site would increase operational efficiencies whilst also allowing for increased product volumes to be shipped. This would moreover marginally increase payroll tax revenues. Based on both direct and indirect jobs creation analysis, it is estimated that this would generate another $40,000 to $45,000 on top of the current tax revenues;
- Given operations at the current Bowral Brickworks Plant are due to cease, the intensity of higher order industrial land uses at the existing Bowral Brickworks Plant is likely to increase. The current operations represent a low density use of that land. With a mix of industrial and commercial uses (e.g. tourism, education and health), it is estimated that the existing Bowral Brickworks Plant site could be redeveloped so as to directly employ around 300 persons. Indirectly, this could result in an additional 150 jobs created. In aggregate this would generate $1.5 to $1.6 million in payroll revenues; and
- The employment factors which drive payroll tax revenues would also lead to increased spending, which in turn increases GST revenues. Based on the projected direct and indirect employment at Berrima, it is estimated that Austral's operations would generate another $100,000 to $120,000 in additional GST revenue for the State of NSW.

Further justification of the need for the Proposed Development is provided in **Part G** of this EIS. The environmental risk assessment undertaken in **Part F** concludes that the Proposed Development is consistent and commensurate with State, regional and local planning objectives, the environmental characteristics of the Site, the surrounding context, and the principles of ecologically sustainable development (ESD).

3.4 CONSIDERATION OF ALTERNATIVES

The intention of the Proposed Development is to develop the Site for a brickworks plant with the capacity to produce 50 million bricks per annum with 24/7 operations. The Proposed Development is justified on the basis that it would:

- Create local jobs;
- Make use of an underutilised site;
- Deliver on Wingecarribee Shire Council's strategic vision for the Site under the MVECDCP2008;
- Develop the Site for a land use which was made permissible at the Site when the Site was rezoned in IN1 General Industrial under the WLEP 2010;
- Ensure the Site is compatible with the desired future local context and character; and
- Have no unacceptable economic, environmental or social impacts.

The options considered, and subsequently dismissed, in arriving to the Proposed Development:

(a) 'Do Nothing' Scenario

This option was dismissed as the Proposed Development objectives, including the objective of undertaking employment-generating development, would not be met. Future developments in the area would also not be supplied with a local source of bricks.

Primarily, were the relocation of the Bowral Brickmaking Plant not to proceed, the higher cost of production would place the long-term viability of the Bowral Brickmaking Plant into question. Should operations at the Bowral Brickmaking Plant fail from an economic standpoint, this could lead to the loss of around 68 indirect and direct jobs for the locality (40 full time equivalent direct jobs, 12 indirect jobs, and 26 jobs in terms of induced spending). Whilst some of these workers might find work within the same area, some of them with specialised skills would be forced to move in order to find suitable work. This cost would be borne by those workers and their families, particularly if the result for them involves higher housing costs and longer commutes.

Relocation of the Berrima Brickworks Plant would result in local jobs staying within the local area. As the Bowral Brickworks Plant and the Berrima Plant site are only located 17 minutes' away from each other via road travel, it would still be feasible for workers to travel to work at the new Berrima Plant site. For some workers, this could mean increased work commute times, whereas for others it would decrease the work commute time. The increased job certainty provided for these workers would be a significant benefit of the Proposed Development. Moreover, the higher output volume at the Berrima Plant site would mean more jobs created in shipping products to market, leading to some increase in local jobs. Overall, it is considered that the Proposed Development would directly and indirectly support around 78 jobs, representing a net increase of 10 jobs. The Proposed Development can therefore be considered to create a a superior employment outcome for the Wingecarribee Shire.

A new, modern brickmaking plant also creates the potential for Austral to explore more options so as to increase its level of circular economy.

Not proceeding with the Proposed Development would mean that these outcomes discussed above would not be realised.

(b) Development on an Alternative Site

Developing an alternative site was not considered to be a feasible alternative. Lot 1 DP 785111 is specifically mapped under the MVECDCP2008 as an Enterprise Precinct, meaning

that Wingecarribee Shire Council's strategic vision for the Site is as part of the transition zone between residential users and heavier industrial users.

The location of the Site was also chosen due to the suitable access arrangements which can be designed, connecting the Site through Berrima Road to the west and the existing quarry road to the north.

The existing Bowral Brickmaking Plant operates within a constrained area of Bowral, meaning that expansion of that Plant is not feasible. Indeed, Bowral functions as a residential township, with a high retiree population and a focus on tourism, education and health. It is possible that a Brickmaking Plan expansion DA in that location would not garner adequate public support.

Moreover, with the Bowral clay source beginning to deplete, sourcing this material from the Berrima Quarry would prove costly, generating significant daily truck movements through largely residential areas.

Locating the proposed Berrima Plant site within Berrima also improves the operational access to the arterial road network. From the current Bowral Brickworks Plant site, the Hume Highway is located around 12 minutes away via the Berrima township, or through Bowral and Mittagong. In contrast, the Site of the Proposed Development would be located less than five minutes from the Hume Highway and would not require travel via the Berrima township. This results in additional benefits of reducing shipping costs and removing trucks from residential areas.

(c) Different Site Configuration

The *Biodiversity Development Assessment Report* (refer to **Appendix 14**) explains how the design of the Proposed Development has been sited so as to allow for the necessary construction and operational requirements whilst also minimising impacts to areas containing biodiversity values. In determining the location of the Proposed Development, the design has sought to minimise direct impacts on native vegetation and habitat by:

- Locating the development footprint primarily in areas comprising cleared land, exotic vegetation and planted vegetation;
- Locating the stormwater basin and drainage corridor primarily within exotic vegetation;
- Locating the development footprint in areas that will impact only on the peripherals of scattered patches of native vegetation, comprising PCT 944 and PCT 731 (or planted native trees assigned to this PCT);
- Largely avoiding areas of native vegetation located between the brick factory and the drainage corridor;
- Locating the development footprint outside of Stony Creek;
- Maintaining the drainage design of the existing overland flow characteristics and hydrology to Stony Creek;
- Retaining areas of native vegetation, comprising PCT 944;
- Situating the development footprint to remove the minimal number of trees of the threatened species *Eucalyptus macarthurii* (Camden Woollybutt) possible;
- Avoiding the use of bulk earthworks across the Study Area and limiting the width of batters so as to retain areas of native vegetation; and
- Maintaining stepping-stone habitat within the rural landscape through the retention of trees across the Study Area that primarily comprise the EEC Southern Highlands Shale Woodland consisting nearly entirely of the threatened *Eucalyptus macarthurii* (Camden Woollybutt).

In terms of Prescribed Impacts under Clause 6.1 of the *Biodiversity Conservation Regulation 2017* (refer to **Table 30** in **Section 6.4**) the design of the Proposed

Development has sought to avoid and minimise direct impacts to waterbodies, water quality and hydrological processes by:

- Locating the development footprint outside of Stony Creek, the most significant tributary at the Site;
- Locating the development footprint in areas containing first and second order ephemeral drainage lines that only provide surface water to Stony Creek during periods of heavy rain; and
- Designing a drainage corridor in the south of the development footprint in order to maintain existing hydrological processes of the Site.

The configuration of the Proposed Development was also specifically chosen so as to

- Maximise the use of the Site within its existing boundaries of Berrima Road and the northern quarry road;
- Capitalise on the location of Berrima Road and northern quarry road to provide suitable site access and egress;
- Avoid impacts to other areas of Lot 1 DP785111 which are potentially constrained due to matters of Aboriginal Cultural Heritage, biodiversity and riparian health; and
- Create minimal operational environmental impacts to sensitive receivers resulting from impacts to the surrounding air quality as well as noise and vibration impacts. Impacts to the surrounding water quality would also be avoided; and
- Make use of a site which is located at a suitable distance from the existing Bowral Brickworks Plant, so as to allow the same workforce participants to be employed at the Proposed Development site.

A different site configuration would have resulted in an outcome which would not necessarily avoid environmental and heritage impacts stemming from the Proposed Development. It would also not capitalize on the Site's existing attributes and may not have been a suitable solution for the Bowral Brickmaking Plant's existing workforce.

This option was therefore not considered appropriate.

PART D LEGISLATIVE AND POLICY FRAMEWORK

4.1 ENVIRONMENT AND PLANNING LAW FRAMEWORK

Table 4 below outlines the current environment and planning law requirements applying to the Proposed Development.

Table 4 Relevant Legislative Instruments	
Instrument	**Application to Proposed Development**
Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)	Under the *Commonwealth Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), any action (which includes a development, project or activity) that is considered likely to have a significant impact on Matters of National Environmental Significance (MNES) (including nationally threatened ecological communities and species and listed migratory species) must be referred to the Commonwealth Minister for the Environment. The purpose of the referral is to allow a decision to be made about whether an action requires approval on a Commonwealth level. If an action is considered likely to have significant impact on MNES, it is declared a "controlled action" and formal Commonwealth approval is required. As individuals of the EPBC Act listed as *Eucalyptus macarthurii* occur with the Subject Site, referral to the Commonwealth is required to be made. Accordingly, a concurrent referral has been made to investigate any further requirements under the EPBC Act.
Native Title Act (1994)	Native Title is considered to have been extinguished at the Site due to the historic freehold titles which have been issued for the Site. Furthermore, a search of the Native Title Register conducted on the 16 January 2020 did not identify any active Native Title claims over the Site.
Environmental Planning and Assessment Act 1979 (EP&A Act)	Section 4.15(1) of the EP&A Act requires that, in determining a DA, a consent authority is to consider the following matters as relevant: ▪ Current or proposed environmental planning instruments, development control plans, planning agreements, the EP&A Regulations, and any coastal zone management plan; ▪ The likely impacts of that development, including environmental impacts on both the natural and built environments, and social and economic impacts in the locality; ▪ The suitability of the Site for the development; ▪ Any submissions made in accordance with this Act or the regulations; and ▪ The public interest. The matters listed in the first point above are considered in this table. The remainder of the matters are dealt with in **Parts E**, **F** and **G** of this EIS. Section 4.41 of the EP&A Act provides that, in the case of SSD, the following authorisations are not required: ▪ A permit under Sections 201, 205 or 219 of the *Fisheries Management Act 1994*; ▪ An approval under Part 4, or an excavation permit under Section 139 of the *Heritage Act 1997*; ▪ An Aboriginal heritage impact permit under Section 90 of the *National Parks and Wildlife Act 1974*;

Table 4 Relevant Legislative Instruments	
Instrument	**Application to Proposed Development**
	▪ A bushfire safety authority under Section 100B of the *Rural Fires Act 1997*; ▪ A water use approval under Section 89, a water management work approval under Section 90 or an activity approval (other than an aquifer interference approval) under Section 91 of the *Water Management Act 2000*. Nevertheless, this EIS has assessed the relevant matters under these statutes as they relate to the Site and the Proposed Development. Section 4.42 of the EP&A Act provides that, in the case of SSD, the following legislation must be applied so as to be substantially consistent with, and may not be refused if it is necessary to carry out, an approved SSD: ▪ An aquaculture permit under Section 114 of the *Fisheries Management Act 1994*; ▪ An approval under Section 15 of the *Mine Subsidence Compensation Act 1961*; ▪ A mining lease under the *Mining Act 1992*; ▪ A production lease under the *Petroleum (Onshore) Act 1991*; ▪ An EPL under Chapter 3 of the POEO Act; ▪ A consent under Section 138 of the *Roads Act 1993*; and ▪ A licence under the *Pipelines Act 1967*. As outlined below, the Proposed Development requires assessment under the *National Parks and Wildlife Act* 1974 and the *Water Management Act 2000*.
Environmental Planning and Assessment Regulation 2000 (EP&A Regulation)	Clause 84 of the EP&A Regulation requires that notice of a proposed SSD must be published in a local newspaper and on the NSW DPIE's website. Brickworks Land and Development would respond to any public comments received from this public notification process.
Protection of the Environment Operations Act 1997 (POEO Act)	The Proposed Development would involve the production of up to 50 million brick products, as well as raw materials crushing and grinding to produce these bricks. Item 7, Schedule 1 of the POEO Act requires an EPL to be issued where a premises would produce more than 15,000 tonnes of ceramic products per annum. Ceramics production is defined as meaning the production of ceramics (other than glass), including products such as bricks, tiles, pipes, pottery goods or refractories manufactured through a firing process. The Proposed Development would therefore require the issue of an Environmental Protection Licence (EPL) from the EPA. Brickworks Land and Development will continue to engage with the EPA for the issue of such an EPL prior to the Proposed Development commencing. During construction works, excavated materials which are deemed unsuitable for reuse as onsite fill would be transported to an offsite waste facility licensed to deal with that type of waste. In general, the Proposed Development would be undertaken so as to not contravene Section 120 (water pollution), Part 5.4 (air pollution), or Section 139 (offensive noise) of the POEO Act.

Table 4 Relevant Legislative Instruments	
Instrument	**Application to Proposed Development**
	The Site would be required, under its EPL, to maintain a complaints handling procedure and contingency plans in the event of a potential environmental harm incident taking place.
Water Management Act 2000 (WM Act)	The Proposed Development would, in the first instance, require a section 91(2) controlled activity approval to carry out controlled activities on waterfront land. However, as the Proposed Development constitutes SSD, such a permit is not required to be issued. Nevertheless, the relevant matters for consideration of works on waterfront land are responded to in **Section 4.3** below.
Biodiversity Conservation Act 2016 (BC Act)	A Test of Significance was undertaken under Section 7.3 of BC Act for the *Southern Highlands Shale Woodlands EEC* (refer to **Appendix 14**). The Test of Significance concluded that the Proposed Development is unlikely to significant affect this Endanger Ecological Community (EEC). Furthermore, the Proposed Development does not trigger the Biodiversity Offset Scheme under the BC Act (refer to **Section 6.6** and **Appendix 14**).
Fisheries Management Act 1994 (FM Act)	The Proposed Development would be undertaken with sufficient setbacks from Stony Creek and adequate erosion and sediment control measures (refer to **Section 6.9** and **Appendix 8**) to avoid significant impacts to the riparian and waterways habitats of the nearby Stony Creek.
National Parks and Wildlife Act 1974 (NP&W Act)	A potential archaeological deposit and areas of moderate-high archaeological sensitivity were identified at the Site (refer to **Section 6.15**). The Proposed Development is likely to have an impact on these items of Aboriginal Cultural Heritage significance. The Aboriginal Cultural Heritage Management Plan prepared in accordance with the Aboriginal Cultural Heritage Assessment Report prepared by Biosis (2020) would be implemented to mitigate any potential impacts to identified Aboriginal Cultural Heritage across the Site (refer to **Section 6.15**).
Heritage Act 1977	There are no previously recorded non-Aboriginal heritage items which would be impacted on by the Proposed Development (refer to **Section 6.16**).

4.2 LOCAL ENVIRONMENTAL PLANNING FRAMEWORK

Table 5 outlines the local planning controls which apply to the Proposed Development.

Table 5 Local Environmental Planning	
Requirement	**Application to Proposed Development**
***Wingecarribee Local Environmental Plan* 2010 General LEP Clauses**	
Permissibility	Lot 1 DP 785111 is zoned IN1 General Industrial pursuant to the WLEP2010. The Proposed Development, being for the purposes of General Industry, is therefore permitted with consent within Lot 1 DP 785111. Lot 1 DP 414246 is zoned E3 Environmental Management pursuant to the WLEP2010, where Roads are permitted with consent. The proposed access road to support the Proposed Development would therefore be permitted within Lot 1 DP 414246.
Clause 2.3 Zone Objectives and Land Use Table	*The consent authority must have regard to the objectives for development in a zone when determining a development application in respect of land within the zone.*
IN1 General Industrial Objectives	*To provide a wide range of industrial and warehouse land uses.*

Table 5 Local Environmental Planning	
Requirement	**Application to Proposed Development**
	The Proposed Development would provide for an additional large-scale industrial development within what is currently an underutilised rural landholding within Lot 1 DP 785111.
	To encourage employment opportunities. The Proposed Development seeks the construction of an additional industrial development on undeveloped rural land within Lot 1 DP 785111. It would therefore generate additional employment opportunities for the region.
	To support and protect industrial land for industrial uses. The Proposed Development is located on Lot 1 DP 785111, which was recently rezoned for industrial purposes, and thus would support the desired land use outcome for the Site and wider locality.
	To allow a range of non-industrial land uses, including selected commercial activities, that provide direct services to the industrial activities and their workforce or that, due to their type, nature or scale, are appropriately located in the zone without impacting on the viability of business and commercial centres in Wingecarribee. The Proposed Development does not preclude non-industrial land uses and developments from being established within proximity to the Site. The Proposed Development is contained to a portion of the existing Lot 1 DP 785111, allowing for range of both industrial and non-industrial land uses within the Site and wider locality.
	To ensure that new development and land uses incorporate measures that take account of their spatial context and mitigate any potential impacts on neighbourhood amenity and character, or the efficient operation of the local or regional road system. The Proposed Development has been designed and sited to respond to the existing site conditions and wider context, as all impacts to surrounding land uses and existing developments have been appropriately mitigated. Furthermore, the configuration of the Proposed Development has been chosen to capitalise on the location of Berrima Road and the northern quarry road to provide suitable site access and egress, as well as conveyance of raw materials from the quarry site to the north.
E3 Environmental Management	*To protect, manage and restore areas with special ecological, scientific, cultural or aesthetic values.* The use of a relatively small portion of Lot 1 DP 414246 for an access roadway into the Site would not impact on any pre-existing ecological, scientific, cultural or aesthetic values. It is important to note that this south-western arm of Lot 1 DP 414246 is currently already being used to provide road access into existing, approved development sites.
	To provide for a limited range of development that does not have an adverse effect on those values. The use of a relatively small portion of Lot 1 DP 414246 for an access roadway into the Site would not impact on those values identified above.
	To encourage the retention of the remaining evidence of significant historic and social values expressed in existing landscape and land use patterns.

Table 5 Local Environmental Planning	
Requirement	**Application to Proposed Development**
	Given that this south-western arm of Lot 1 DP 414246 has previously been approved for use as an access roadway for industrial developments, the Proposed Development's use of this portion of land for the same purposes would not create any additional historical, social or landscaping impacts.
	To minimise the proliferation of buildings and other structures in these sensitive landscape areas. The Proposed Development does not seek to construct any buildings or other structures on Lot 1 DP 414246. However, the proposed vehicular crossover would traverse this portion of land.
	To provide for a restricted range of development and land use activities that provide for rural settlement, sustainable agriculture, other types of economic and employment development, recreation and community amenity in identified drinking water catchment areas. The Proposed Development does not seek to construct any buildings or other structures on Lot 1 DP 414246. However, the proposed vehicular crossover would traverse this portion of land.
	To protect significant agricultural resources (soil, water and vegetation) in recognition of their value to Wingecarribee's longer term economic sustainability. Given that this south-western arm of Lot 1 DP 414246 has previously been approved for use as an access roadway for industrial developments, the Proposed Development's use of this portion of land for the same purposes would not create any additional impacts to nearby agricultural resources.
Clause 4.1 – Minimum Subdivision Lot Size	Lot 1 DP 785111 is not subject to any minimum lot size, and Lot 1 DP 414246 is subject to a 40 ha minimum lot size. Nevertheless, the Proposed Development does not seek to subdivide the Site.
Clause 4.3 – Height of Buildings	The Site is not subject to any maximum building height under the WLEP 2010. In any event, the Proposed Development would have a maximum height of 20 m (building component) and 35 m (kiln stacks).
Clause 4.4 – Floor Space Ratio	The Site is not subject to any maximum floor space ratio under the WLEP 2010. In any event, the Proposed Development would have an FSR of 0.19:1.
Clause 5.10 – Heritage Conservation	Subclause 5.10(4) provides that a consent authority must consider the effect of a development on the heritage significance of heritage item or heritage conservation area. As discussed in **Section 6.16**, there are no previously recorded non-Aboriginal heritage items which would be impacted on by the Proposed Development. Subclause 5.10(8) provides that a consent authority must: ▪ Consider the effect of a development on the heritage significance of an Aboriginal place of heritage significance and any Aboriginal object which is known or reasonably likely to be located at the Site; ▪ Notify the local Aboriginal communities; and ▪ Take into account any response received with 28 days. A potential archaeological deposit and areas of moderate-high archaeological sensitivity were identified at the Site (refer to **Section**

Table 5 Local Environmental Planning	
Requirement	**Application to Proposed Development**
	6.15). The Proposed Development is likely to have an impact on these items of Aboriginal Cultural Heritage significance. The Aboriginal Cultural Heritage Management Plan prepared in accordance with the Aboriginal Cultural Heritage Assessment Report prepared by Biosis (2020) would be implemented to mitigate any potential impacts to identified Aboriginal Cultural Heritage across the Site (refer to **Section 6.15**).
Clause 6.1 – Arrangements for Designated State Public Infrastructure	The Site is not mapped within an Urban Release Area under the WLEP 2010. As such, Clause 6.1 does not apply to the Proposed Development.
Clause 7.3 - Earthworks	Clause 7.3 sets out considerations for the consent authority prior to granting consent for earthworks. These matters are responded to as follows: ▪ The Proposed Development would not impact on nearby flooding regimes (refer to **Section 6.9**). Erosion and sediment control measures would mitigate any temporary impacts to Stony Creek (refer to **Section 6.9**); ▪ The Proposed Development would not reduce the likely future uses or redevelopment opportunities of the Site; ▪ A Remedial Action Plan (RAP) is required to manage ACM present on-site to mitigate potential risks to current and future on-site and offsite receptors (refer to **Section 6.10**); ▪ Standard construction management measures would mitigate any temporary impacts to adjoining properties; ▪ Excavated materials which are deemed unsuitable for reuse as onsite fill would be transported to an offsite waste facility licensed to deal with that type of waste; ▪ Standard construction management measures would mitigate any temporary impacts to Stony Creek. The Proposed Development would not significantly impact on the biodiversity values of the locality (refer to **Section 6.6**). Overall, the Proposed Development is considered consistent with Clause 7.3.
Clause 7.4 – Natural Resources Sensitivity – Biodiversity	The Site is not mapped as containing a Regional Wildlife Habitat Corridor under the WLEP2010. No further consideration of Clause 7.4 is therefore required.
Clause 7.5 – Natural Resources Sensitivity – Water	The Site is not mapped as containing a Natural Waterbody under the WLEP 2010. No further consideration of Clause 7.5 is therefore required.
Clause 7.6 – Extractive Materials	The Site is not mapped as Identified and Potential Extractive Material or Identified and Potential Extractive Material-Buffer zone under the WLEP 2010. No further consideration of Clause 7.6 is therefore required.
Clause 7.9 – Flood Planning	The Site is not mapped as containing flood prone land under the WLEP 2010. No further consideration of Clause 7.9 is therefore required.
Schedule 1 – Additional Permitted Uses	The Site is identified as being within the Moss Vale Industrial Corridor and may make use of an additional permitted uses subject to Clause 21 of Schedule 1. Within the Moss Vale Industrial Corridor, development for the purpose of tourist and visitor accommodation is permitted with consent. It is noted that the Proposed Development does not include the provision of any tourist or visitor accommodation components.

4.3 ENVIRONMENTAL PLANNING POLICY FRAMEWORK

Table 6 outlines the State Environmental Planning Policies which apply to the Proposed Development.

Table 6 State Environmental Planning Policies	
Instrument	**Application to Proposed Development**
State Environmental Planning Policy No. 55 – Remediation of Land (SEPP 55)	The *Preliminary Site Investigation* prepared by Senversa (2019) (refer to **Section 6.10** and **Appendix 9**) found that: ▪ The Site is underlain to the west by Hawkesbury Sandstone and the Wiannamatta Group within its central eastern portion. ▪ Groundwater is likely to be present within fractured bedrock at depths ranging between 20 m Below Ground Level (BGL) to 40 m BGL. An artificial dam was noted to be present within the south eastern portion of the Site. ▪ General waste such as tyres, plastic, metal scraps and potential Asbestos Containing Materials (ACM) were observed where the farmhouse on-site used to be located, as well as in the southeast portion of the Site, where stockpiles of dumped material, including potential ACM were noted to be present. ▪ The Site generally slopes towards to the west and northwest and the time of the Site inspection limited evidence of anthropogenic modifications was observed within its topography. ▪ The Site appeared to be free from visual or olfactory indications of contamination, such as staining and / or odours. Senversa (2019) conclude, that a Remedial Action Plan (RAP) is required to manage ACM present on-site to mitigate potential risks to current and future on-site and offsite receptors.
State Environmental Planning Policy (Infrastructure) 2007 (ISEPP)	The Proposed Development is for an industrial premise which is greater than 20,000 m^2. It therefore constitutes Traffic Generating Development under the ISEPP and would be referred to Roads and Maritime Services (RMS) accordingly.
State Environmental Planning Policy No 19 - Bushland in Urban Areas (SEPP 19)	As SEPP 19 does not apply to the Wingecarribee LGA, no further consideration of Bushland SEPP is required in this EIS.
State Environmental Planning Policy No 44 – Koala Habitat Protection (Koala SEPP)	The Wingecaribee LGA is subject to Koala SEPP. However, there are no Koala feed tree species present at the Site. As such, no further consideration of Koala SEPP is required.
State Environmental Planning Policy No 33—Hazardous and Offensive Development	Review of the quantities of dangerous goods proposed to be stored at the Site as part of the Proposed Development against *Hazardous and Offensive Development Application Guidelines Applying SEPP 33* (Department of Planning, 2011) was undertaken. This found that the SEPP 33 threshold quantities for dangerous goods to be stored and transported at the Site would not be exceeded. As such, SEPP 33 does not apply to the Proposed Development, and no further assessment against SEPP 33 is considered warranted (refer to **Section 6.17** and **Appendix 18**).
State Environmental Planning Policy No 64—Advertising and Signage (SEPP 64)	The Proposed Development would provide business identification signage, which would be located to the southern, northern and western facades of buildings at the Site (refer to **Appendix 4**). SEPP 64 sets out requirements for advertising and signage, which the consent authority must have regard to.

Table 6 State Environmental Planning Policies	
Instrument	**Application to Proposed Development**
	(a) *That the signage is consistent with objectives of this Policy as set out in Clause 3 (1) (a), and* (b) *That the signage the subject of the application satisfies the assessment criteria specified in Schedule 1.* The SEPP 64 Policy objective matters are addressed as follows: ▪ The proposed signage is compatible with the existing and future use of the locality as part of an Enterprise Precinct under the Moss Vale Enterprise Corridor; ▪ The proposed signage would effectively and clearly communicate the brand of Austral Masonry and the Site's use for masonry manufacturing and related activities; ▪ The proposed signage would be of high quality design and finish; and ▪ The proposed signage would not conflict with any traffic, pedestrian or cyclist safety along the surrounding street network. The SEPP 64 Schedule 1 matters are addressed as follows: ▪ Character of the area: o The proposed signage is compatible with the existing and future use of the locality as part of an Enterprise Precinct under the Moss Vale Enterprise Corridor; o The proposed signage is consistent with the growing theme of industrial style outdoor advertising in the area; ▪ Special areas: o The proposed signage does not detract from the amenity or visual quality of any environmentally sensitive areas, heritage areas, natural or other conservation areas, open space areas, waterways, rural landscapes or residential areas; ▪ Views and vistas: o The proposed signage would not obscure or compromise important views; o The proposed signage would not dominate the skyline or reduce the quality of vistas; o The proposed signage respects the viewing rights of other advertisers; ▪ Streetscape, setting or landscape: o The scale, proportion and form are all appropriate for the streetscape, setting and landscape; o The proposed signage contributes to the visual interest of the streetscape, setting and landscape; o The proposed signage would not reduce or create clutter; o The proposed signage would not be used as a visual screen and does not screen any unsightliness; o The proposed signage would not protrude above buildings, structures or tree canopies in the area;

Table 6 State Environmental Planning Policies	
Instrument	**Application to Proposed Development**
	○ The proposed signage would not require any maintenance and would not require ongoing vegetation management; ▪ Site and building: ○ The proposed signage is compatible with the scale proportion and streetscape of the Proposed Development; ○ The proposed signage does not detract from and respects the important features of the Proposed Development; ○ The design of the signage retains the innovative relationship to the Site; ▪ Associated devices and logos with advertisements and advertising structures: ○ The proposed signage incorporates an Austral Masonry logo; ▪ Illumination: ○ The proposed signage would not involve illumination; ▪ Safety: ○ The proposed signage would not reduce the safety for any public road; ○ The proposed signage would not reduce the safety for pedestrians, or cyclists; and ○ The proposed signage would not reduce the safety for pedestrians or children by obscuring sightlines from public areas.
State Environmental Planning Policy (State and Regional Development) 2011 (SRD SEPP)	Pursuant to Schedule 1 of Schedule 1 to *State Environmental Planning Policy (State and Regional Development) 2011*, the Proposed Development meets the following trigger for State Significant Development: ▪ Clause 9 metal, mineral and extractive material processing with a CIV of more than $30M for the purposes of brickworks. The Department of Planning, Infrastructure and Environment has issued State Significant Development number 10422 to the Proposed Development.
State Environmental Planning Policy (Sydney Drinking Water Catchment) 2011 (Drinking Catchment SEPP)	The Site is mapped within the Wingecarribee River subcatchment of the Drinking Catchment SEPP. As outlined in Section 6.9.8 and **Appendix 8**, the Proposed Development can meet the relevant water quality parameters required under Drinking Catchment SEPP.

4.4 STRATEGIC PLANNING FRAMEWORK

This section outlines the strategic planning context of the Site.

4.4.1 Sydney-Canberra Corridor Regional Strategy 2006-2031

The *Sydney-Canberra Corridor Regional Strategy 2006-2031* (Regional Strategy) recognises the Corridor as a region of significant potential with State and national importance, linking Sydney and Canberra. Australia's largest city, Sydney, and the nation's capital both influence the Corridor. This is most evident in terms of the extent of commuting and where development within the Corridor is largely taking place (at the northern and southern ends of the Corridor).

The Corridor's population is projected to be 183,350 by 2031, representing growth of 46,350 people requiring an additional 25,200 dwellings and 27,800 jobs.

The Site lies within the northern subregion of the Corridor, and Moss Vale itself is mapped as a Major Town (refer to **Figure 16**). Key functions of Major Town within the Corridor are the provision of local and district services and facilities, including the general range of weekly and some higher order goods and business services. The full range of housing types generally provided within these Major Towns.

The Regional Strategy seeks to promote and accommodate the Corridor's projected employment growth. It aims to reduce the proportion of the Corridor's workforce commuting outside of the region from 26% to 20%, and sets out specific actions for identifying and preserving new employment land released within the Corridor. The Regional Strategy describes the Moss Vale-Berrima Enterprise Corridor as 630 hectares of land between Moss Vale and Berrima, being competitive surplus land given its location in terms of regional infrastructure (proximity to the Hume Highway, servicing by a natural gas main pipeline, a siding on the Main Southern Railway and direct rail connection to Port Kembla). Under the Regional Strategy, Wingecarribee Shire Council is committed to planning for the provision of infrastructure and the sequencing of development in the Moss Vale-Berrima Enterprise Corridor. This includes infrastructure funding, sequencing and staging arrangements. Particular consideration is to be given to the upgrading of the regional transport network, specifically road links to the Hume Highway and rail-siding access to the Main Southern Railway.

Wingecarribee Shire Council's rezoning of the Moss Vale Enterprise Corridor and the formulation of the *Section 94 Developer Contributions Plan for The Moss Vale Enterprise Corridor 2013 to 2050* are direct responses to these actions (refer to **Sections 2.3** and **6.14**).

The Regional Strategy recognises how demand for employment within the Northern subregion of the Corridor arises due to:

- An increase in population within the subregion and the proximity of the area to Sydney and the Illawarra;
- Proximity to major metropolitan markets for regionally based business;
- Improved accessibility of the area through infrastructure such as the M7 and M5 in Sydney;
- Land affordability; and
- High rates of commuting out of the subregion.

The Proposed Development is directly aligned with the following Aims identified in the Regional Strategy:

- Ensure an adequate supply of land to support economic growth and provide capacity to accommodate a projected 27,800 new jobs, particularly in the areas of manufacturing, transport and logistics, business services, health, aged care and tourism;
- Limit development in places constrained by important primary industry resources and significant scenic and cultural landscapes; and
- Protect the cultural and Aboriginal heritage values and visual character of rural towns and villages and surrounding landscapes.

It is also aligned with the following biodiversity and cultural heritage actions within the Regional Strategy:

- New development adjoining or adjacent to areas of high biodiversity value will incorporate buffers to avoid land use conflict; and

- Councils will ensure that Aboriginal cultural and community values are considered in the future planning and management of the local government area.

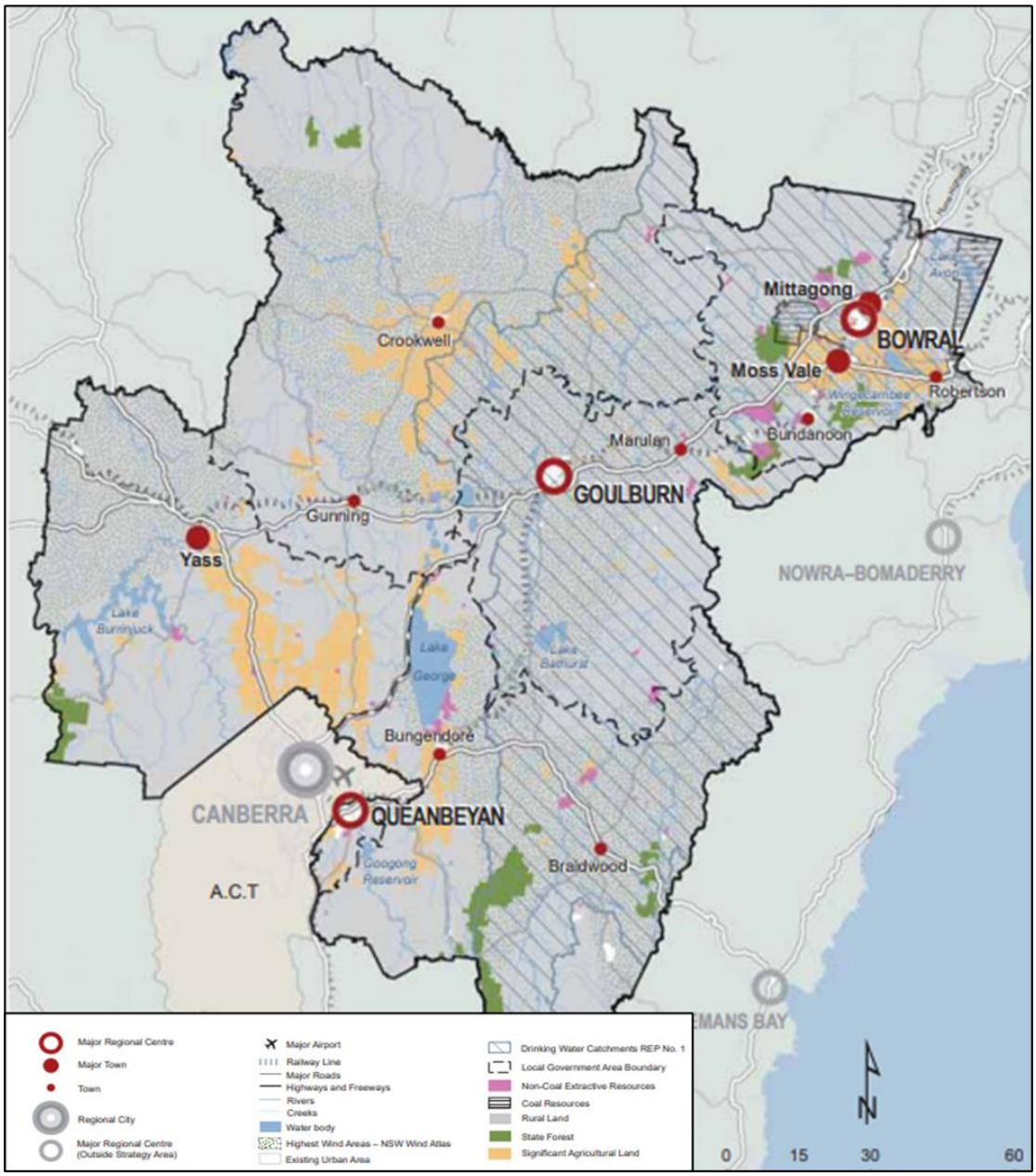

Figure 16 Natural Resources Map (Source: NSW DPIE, 2008)

4.4.2 South East and Tablelands Regional Plan 2036

The *South East and Tablelands Regional Plan 2036* (Regional Plan) recognises the South East and Tablelands Region as a borderless region in Australia's most geographically diverse natural environment with the nation's capital at its heart.

The Regional Plan describes how the Wingecarribee and Goulburn-Mulwaree LGAs are well positioned to use Western Sydney's growth as an impetus to create new jobs. It notes how, of the Wingecarribee workforce (around 18,750 people) almost 16% commute to Sydney for work with the remainder either working locally or travelling elsewhere for work. It is furthermore projected that by 2036, more than 320,000 people will live in the South East and Tablelands Region.

The Regional Plan identifies Moss Vale as a Strategic Centre (refer to **Figure 17**), centres being the largest commercial components of the region providing a full range of higher-order services (e.g. hospitals and tertiary education). These Strategic Centres can leverage advances in information technology, creating smart work opportunities that connect people physically and digitally.

The Regional Plan sets out the following goals for the Region as a whole:

- A connected and prosperous economy;
- A diverse environment interconnected by biodiversity corridors;
- Healthy and connected communities; and
- Environmentally sustainable housing choices.

The Proposed Development would make use of underutilised, industrially zoned land for suitable employment generating purposes near to where people live. This is particularly the case as the Regional Plan recognises how the availability of jobs enables economic development, particularly the well-located opportunity of the Moss Vale Enterprise Corridor. The Proposed Development would also not create any significant biodiversity or social impacts, furthermore demonstrating consistency with the Regional Plan (refer to **Sections 6.6** and **4.4.2**).

Within the Wingecarribee LGA itself, the population is projected to grow by 4,050 by 2036, requiring an additional 3,300 dwellings. Moss Vale and other towns service the needs of residents for government administration, education, health and retail opportunities. Direct links to the Hume Highway, the M7 and the main North-South rail line and dedicated freight line to Port Kembla provide access to Sydney's economic markets. Relevant priorities for the Wingecarribee LGA in particular include:

- Protect high environmental value lands including regionally significant biodiversity corridors;
- Protect the Sydney Drinking Water Catchment;
- Protect the Shire's valued heritage assets;
- Capitalise on economic opportunities arising from the area's proximity to Sydney; and
- Capitalise on the land availability in the Moss Vale Enterprise Corridor to attract industry and investment.

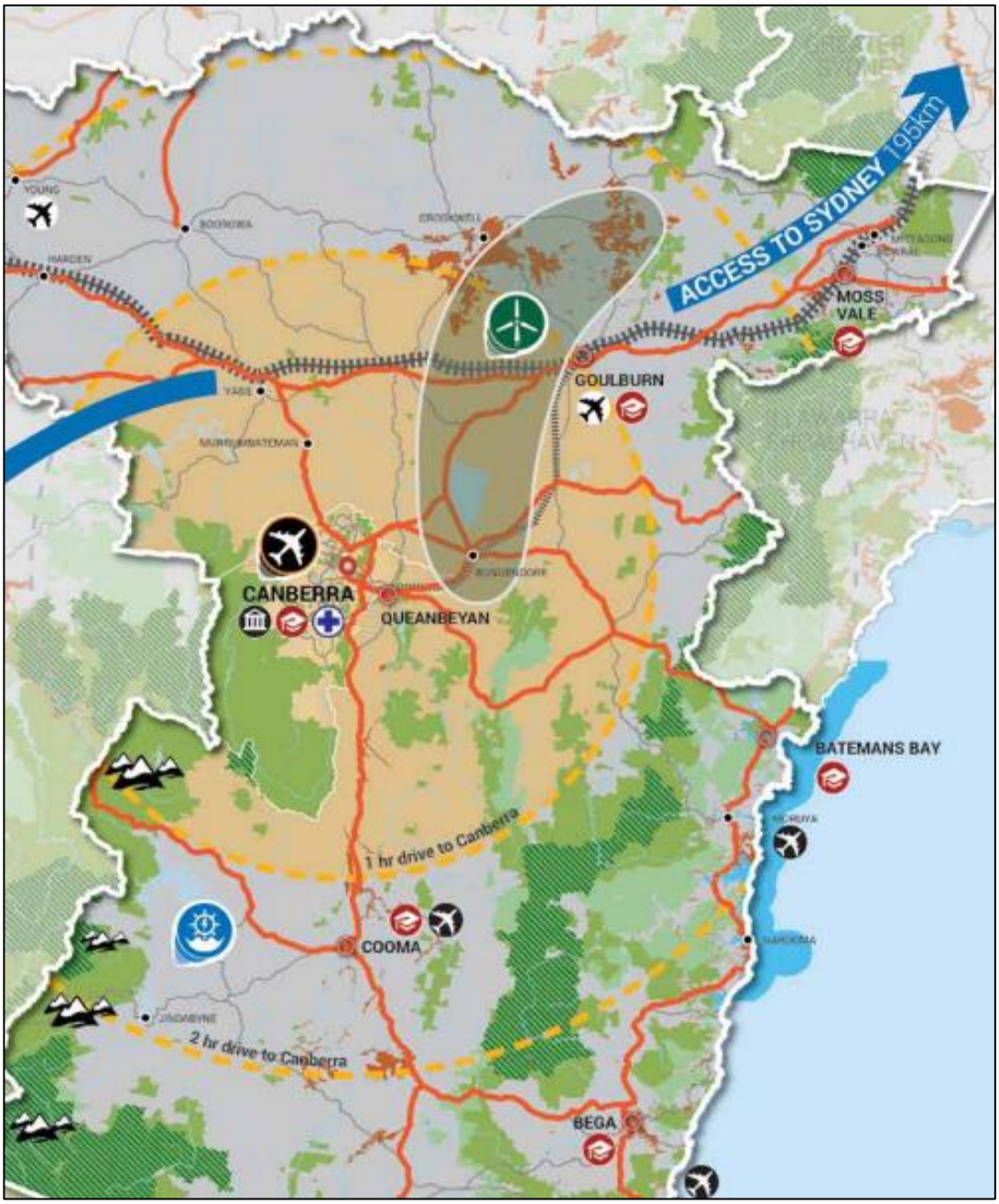

Figure 17 South East and Tablelands (Source: NSW DPIE, 2017)

As demonstrated in **Section 6.6**, the Proposed Development would not create any significant biodiversity impacts. The Proposed Development can also proceed consistent with the requirements of the Drinking Catchment SEPP (refer to **Table 4** in **Section 4.3**). **Section 6.15** outlines mitigation measures to ensure the Proposed Development does not create unacceptable impacts for items of Aboriginal Cultural Heritage significance, while **Section Section 6.16** confirms that the Proposed Development would not significantly impact on any items of non-Aboriginal heritage significance. The Proposed Development has been strategically positioned to make the most of the Site's location within the Moss Vale Enterprise Corridor, including connectivity via the Hume Highway to the Greater Sydney Metropolitan Area. It would also deliver on Wingecarribee Shire Council's strategic vision for the Site under the MVECDCP2008.

The Proposed Development is furthermore directly aligned with the following Directions and Actions identified in the Regional Plan:

- Direction 4: Leverage growth opportunities from Western Sydney:

  - Action 4.1: Foster initiatives to promote the South East and Tablelands as a suitable place for businesses to relocate; and
  - Action 4.2: Maintain a supply of appropriately serviced employment land to create opportunities for new industrial development; and
- Direction 18: Secure water resources:
  - Action 18.1: Locate, design, construct and manage new developments to minimise impacts on water catchments, including downstream impacts and groundwater sources; and
  - Action 18.4: Incorporate water sensitive urban design into development that is likely to impact water catchments, water quality and flows;
- Direction 23: Protect the region's heritage:
  - Action 23.1: Undertake and implement heritage studies, including regional Aboriginal cultural heritage studies, to inform local strategies;
  - Action 23.2: Consult with Aboriginal people and the broader community to identify heritage values at the strategic planning stage;
  - Action 23.3: Conserve heritage assets during local strategic planning and development;
  - Action 23.4: Provide resources for heritage advice to inform planning processes; and
  - Action 23.5: Acknowledge cultural heritage assets where appropriate, and consider how these assets can add value to a development.

The Proposed Development is therefore considered to be consistent with the Regional Plan.

4.4.3 Moss Vale Enterprise Corridor Development Control Plan 2008

The Site falls within a mapped Enterprise Corridor (refer to **Figure 18**) under the MVECDCP 2008.

Under the MVECDCP 2008:

> *The Moss Vale Enterprise Corridor is to be developed as a sustainable employment area in accordance with the Development Concept Plan. The Enterprise Corridor will cater for conventional light and general industrial development to meet local and regional demands for industrial land. It is also anticipated to accommodate business park commercial development and larger scale freight storage and distribution operations associated with existing rail infrastructure and a possible intermodal freight terminal.*

According to the MVECDCP 2008:

> *The Enterprise Precinct includes land at and near the interface with the Moss Vale township and existing light industrial development. This precinct will facilitate a transition between residential uses and heavier industrial uses across the northern parts of the Enterprise Corridor. This precinct will accommodate a mix of light industrial and commercial office uses.*

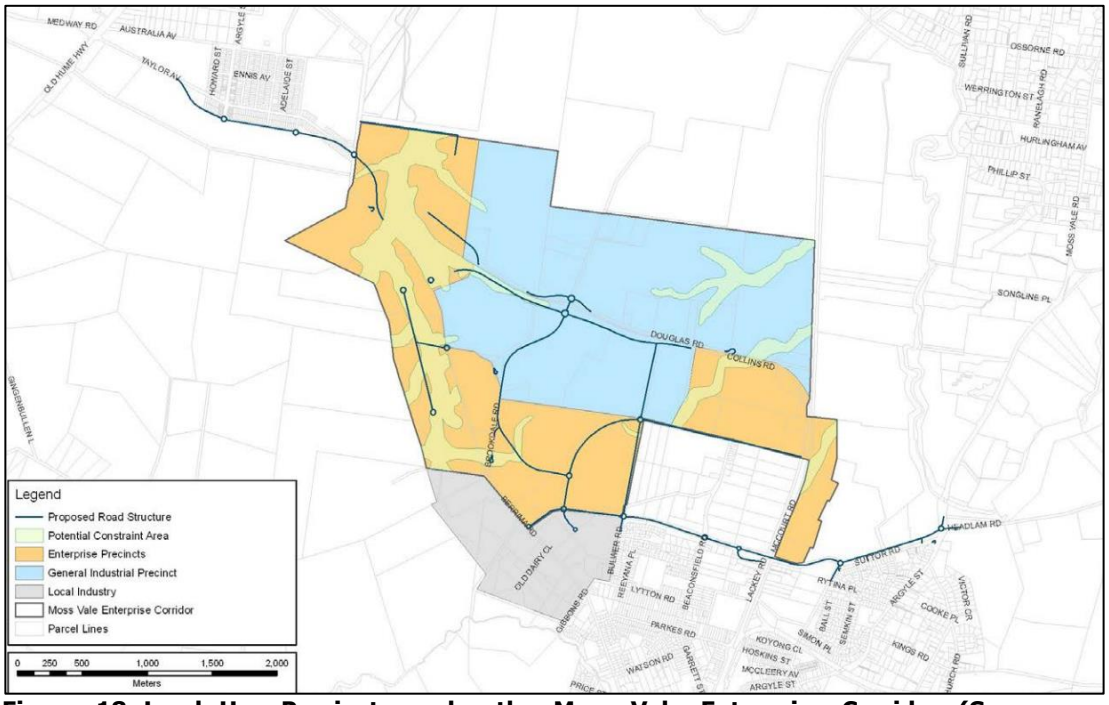

Figure 18 Land Use Precincts under the Moss Vale Enterprise Corridor (Source: Wingecarribee Shire Council, 2008)

The Site forms the western gateway to the Moss Vale Enterprise Corridor. The Moss Vale Enterprise Corridor comprises 630 ha of land primarily zoned IN1 General Industrial under the WLEP2013. There are also pockets of land zoned IN3 Heavy Industrial on the corner of Berrima Road and Taylor Avenue for the existing Blue Circle Cement Works. The majority of land within the Moss Vale Enterprise Corridor continues to be used for agricultural purposes.

The Proposed Development is a direct response to this industrial zoning of the Moss Vale Enterprise Corridor for employment generating purposes, further realising the aims of both the Regional Strategy and the Regional Plan (refer to **Sections 4.4.1 and 4.4.2**).

4.5 PLANNING AGREEMENTS FRAMEWORK

The Site and the Proposed Development are not subject to any current Planning Agreements under Section 7.4 of the EP&A Act.

PART E CONSULTATION

5.1 SECRETARY'S ENVIRONMENTAL ASSESSMENT REQUIREMENTS

An application to receive SEARs was submitted to DPIE (Reference No. SSD-10422). The SEARs were subsequently issued on 11 February 2020.

The SEARs issued are annexed as **Appendix 1**. An overview of how the requirements have been satisfied within the EIS is outlined in **Table 7**. This document is also consistent with the minimum requirements for an EIS in clauses 6 and 7 of Schedule 2 of the EP&A Regulation.

Table 7 How SEARs have been satisfied	
General Requirements	**How Addressed**
The environmental impact statement (EIS) must be prepared in accordance with, and meet the minimum requirements of clauses 6 and 7 of Schedule 2 of the *Environmental Planning and Assessment Regulation 2000* (the Regulation).	This EIS has been prepared in accordance with Clauses 6 and 7 of Schedule 2 of the EP&A Regulation. The structure of this EIS addresses all legislative requirements.
In addition, the EIS must include a:	
▪ Detailed description of the development, including: ○ Need for the Proposed Development; ○ Justification for the Proposed Development; ○ Likely staging of the development; ○ Likely interactions between the development and existing, approved and proposed operations in the vicinity of the Site; and ○ Plans of any proposed building works.	Refer to **Sections 3.3**, **7.1**, **2.1**, **3.2.1**, **3.2.5** and **3.2** and **Appendix 4** & **5**.
▪ Consideration of all relevant environmental planning instruments, including identification and justification of any inconsistencies with these instruments;	Refer to **Table 5** and **Table 6** in **Sections 4.2** and **4.3**.
▪ Risk assessment of the potential environmental impacts of the development, identifying the key issues for further assessment;	Refer to **Part F**.
▪ Detailed assessment of the key issues specified below, and any other significant issues identified in this risk assessment, which includes: ○ A description of the existing environment, using sufficient baseline data; ○ An assessment of the potential impacts of all stages of the development, including any cumulative impacts, taking into consideration relevant guidelines, policies, plans and statutes; and ○ A description of the measures that would be implemented to avoid, minimise, mitigate and if necessary, offset the potential impacts of the development, including proposals for adaptive management and/or contingency plans to manage significant risks to the environment; and ○ Consolidated summary of all the proposed environmental management and monitoring	Refer to **Sections 2.1** and **2.3**, as well as **Part F**. Refer to **Part F**. Refer to **Part F** and **Part H**. Refer to **Part H**.

Table 7 How SEARs have been satisfied	
General Requirements	**How Addressed**
measures, highlighting commitments included in the EIS.	
▪ The EIS must also be accompanied by a report from a qualified quantity surveyor providing: o A detailed calculation of the capital investment value (CIV) of the proposal as defined in clause 3 of the Regulation, including details of all components of the CIV; and o A close estimate of the jobs that will be created by the development during the construction and operational phases of the development; and certification that the information provided is accurate at the date of preparation.	Refer to **Section 6.21** and **Appendix 2** & **24**.
Key Issues	
The EIS must include an assessment of the potential impacts of the proposal (including cumulative impacts) and develop appropriate measures to avoid, mitigate, manage and/or offset these impacts. The EIS must address the following specific matters:	
▪ **Community and Stakeholder Engagement** – including: o A detailed community and stakeholder participation strategy which identifies who in the community has been consulted and a justification for their selection, other stakeholders consulted and the form(s) of the consultation, including a justification for this approach; o A report on the results of the implementation of the strategy including issues raised by the community and surrounding occupiers and landowners that may be impacted by the proposal**;** o Details of how issues raised during community and stakeholder consultation have been addressed an whether they have resulted in changes to the proposal; and o Details of the proposed approach to future community and stakeholder engagement based on the results of the consultation.	Refer to **Section 5.2** and **Appendix 25** & **26**. Refer to **Section 5.2** and **Appendix 25** & **26**. Refer to **Section 5.2** and **Appendix 25** & **26**. Refer to **Section 5.2** and **Appendix 25** & **26**.
▪ **Strategic Context** – including: o Detailed justification for the proposal and suitability of the Site and proposed transport routes; o Details of any proposed consolidation or subdivision of land; and o Demonstration that the proposal is consistent with all relevant planning strategies, environmental planning instruments, adopted precinct plans, draft district plan(s) and adopted management plans and justification for any inconsistencies.	Refer to **Sections 2.5, 3.3** & **7.1**. N/A – as the Proposed Development does not seek to subdivide the Site. Refer to **Section 4.4**.

Table 7 How SEARs have been satisfied	
General Requirements	**How Addressed**
▪ **Air Quality** - including: ○ A comprehensive air quality assessment of all potential point source and fugitive air emissions (including odour) and dust impacts from the development, including details of air quality impacts on private properties in accordance with relevant Environment Protection Authority guidelines; ○ Details of mitigation, management and monitoring measures for preventing and/or minimising both point and fugitive emissions; and ○ An assessment of the effectiveness of the proposed air quality mitigation measures.	Refer to **Section 6.5** and **Appendix 13**.
▪ **Noise** – including: ○ A quantitative assessment of construction, operation and transport noise and vibration impacts, including cumulative noise impacts, on nearby sensitive receivers, landowners and businesses in accordance with relevant Environment Protection Authority guidelines; and ○ Details and justification of noise mitigation, management and monitoring measures.	Refer to **Section 6.7** and **Appendix 12**.
▪ **Traffic and Transport** – including: ○ Details of all traffic and transport demands likely to be generated during construction and operation, including a description of haul routes; ○ Details on access to the Site from the road network including intersection location, design and sight distance; ○ An assessment of predicted impacts on road safety and the capacity of the road network to accommodate the project; ○ Detailed plans of the proposed layout of the internal road network and parking on site in accordance with the relevant Australian standards.	Refer to **Section 6.11** and **Appendix 11**.
▪ **Visual** – including: ○ Height, scale, signage and lighting, particularly from nearby public receivers and vantage points of the broader public domain (i.e. roads); and ○ Landscaping to minimise visual impacts and/or offset any clearing. All species used for landscaping shall be listed within the 'Cumberland Plain Woodland' endangered ecological community.	Refer to **Sections 6.3** and **6.20**, and **Appendices 5-7**.
▪ **Greenhouse Gas** – including: ○ A quantitative assessment of the potential Scope 1 and 2 greenhouse gas emissions of the development, and a qualitative assessment of the potential impacts of these emissions on the environment; and	Refer to **Sections 6.13 & 6.23** and **Appendix 20**.

Table 7 How SEARs have been satisfied	
General Requirements	**How Addressed**
○ A detailed description of the measures that would be implemented on site to ensure that the development is energy efficient.	
▪ **Soils and Water** - including: ○ A description of the catchment and proximity of the Site to waterways; ○ Consideration of potential local and mainstream flooding impacts; ○ An assessment of potential surface and groundwater impacts associated with the development, including potential impacts on watercourses and riparian areas, groundwater and groundwater dependent communities nearby; ○ An assessment against the requirements of *State Environmental Planning Policy (Sydney Drinking Water Catchment) 2011,* including the requirements for an assessment of the neutral or beneficial impacts of the development on water quality within the drinking water catchment; ○ A description of the surface, stormwater and wastewater management systems, including on site detention, and measures to treat or reuse water; ○ A detailed water balance including a description of the water demands and breakdown of water supplies; and any water licensing requirements; ○ Description of the measures to minimise water use; ○ Details of site history with regards to potential contamination; and ○ Description of the construction erosion and sediment controls.	Refer to **Section 6.9** & **6.10** and **Appendix 8** & **9.**
▪ **Waste Management** – including: ○ Details of the quantities and classification of waste and wastewater to be generated on site; ○ Details on waste storage, handling and disposal; and ○ Details of the measures that would be implemented to ensure the development is consistent with the aims, objectives and guidance in the *NSW Waste Avoidance and Resource Recovery Strategy 2014 - 2021*.	Refer to **Section 6.12** and **Appendix 19**.
▪ **Biodiversity** – including: ○ Details of the number of trees to be removed and the number of trees to be planted on the Site; ○ An assessment of the proposal's biodiversity impacts in accordance with the *Biodiversity Conservation Act 2016*, including the preparation of a Biodiversity Development Assessment Report (BDAR) where required	Refer to **Section 6.6** and **Appendix 14-16**.

Table 7 How SEARs have been satisfied	
General Requirements	**How Addressed**
under the Act, except where a waiver for preparation of a BDAR has been granted.	
▪ **Bushfire and Incident Management** – including: ○ Assess the level of hazard posed to future development on adjacent land and how the hazards may change as a result of development; ○ Address the requirements of Planning for Bush Fire Protection 2006 (RFS), in particular the provision of access (including perimeter roads) and water supply for firefighting purposes.	Refer to **Section 6.8** and **Appendix 17**.
▪ **Heritage and Aboriginal Cultural Heritage** – including an assessment of Aboriginal cultural heritage values that exist across the Site, documented in an Aboriginal Cultural Heritage Assessment Report (ACHAR) or an assessment of Aboriginal cultural heritage issues which satisfies the due diligence requirements of the *National Parks and Wildlife Act 1974*.	Refer to **Section 6.15** and **Appendix 22** & **23**.
▪ **Hazards** – including an assessment of the potential fire risks of the development.	Refer to **Section 6.17** and **Appendix ….**
▪ **Cumulative Impacts** – particularly in relation to air, noise and traffic associated with other nearby industrial or commercial operations.	Refer to **Sections 6.5, 6.7** & **6.11** and **Appendix 11-13**.
Consultation	
During the preparation of the EIS, you must consult with the relevant local, State or Commonwealth Government authorities, service providers, community groups and affected landowners. In particular you must consult with: ▪ Environment Protection Authority; ▪ Wingecarribee Shire Council; ▪ Department of Planning, Industry and Environment (Environment, Energy & Science); ▪ Transport for New South Wales; ▪ Water New South Wales; ▪ Department of Primary Industries; ▪ NSW Fire and Rescue; and ▪ Local community and other stakeholders.	Refer to **Section 5.2** and **Appendix 26**.
Further Consultation After Two Years	
If you do not lodge a Development Application and EIS for the development within 2 years of the issue date of these SEARs, you must consult further with the Secretary in relation to the preparation of the EIS.	Noted.

During the preparation of the SEARs, the NSW DPIE also consulted with stakeholders, and obtained a list of their Key Issues for the Proponent to assess in this EIS. These Key Issues for assessment are contained in **Table 8** to **Table 12**.

Table 8 Environment Protection Authority's Key Issues for Assessment	
Environmental Assessment Requirements	**How Addressed**
EPA Licensing and Regulation	
The Protection of the Environment Operations Act 1997 (POEO Act) and any associated regulations should be complied with at all times.	Refer to **Table 4** in **Section 4.1**.
Under the Protection of the Environment Operations Act 1997 (POEO Act), the company currently hold an Environment Protection Licence (EPL No 2073) for the Bowral brickworks plant. The Bowral brickworks premises is currently licensed under '*ceramic works*.' The proponent should check the EPA Guide to Licensing on the need to obtain an Environment Protection Licence (EPL) for the proposed new development. Based on a review of the information provided, it appears an EPL may be required.	Refer to **Table 4** in **Section 4.1**.
Planning Consideration	
Details should be documented on the location of the Proposed Development including the affected environment to place the proposal in its local and regional environmental context. This should include but not be limited to details of land ownership, maps and/or aerial photographs showing surrounding land uses, planning zonings, potential sensitive receptors and catchments. Details should also be provided on the proposal's relationship to any other industry or facility. This should include details on the future of the existing Bowral brickworks plant and the transitional arrangements during the construction of the new plant.	Refer to **Sections 1.2**, **2.1**, **2.2**, **2.3** and **2.4**.
The Environmental Impact Statement (EIS) should describe mitigation and management options that will be used to prevent, control, abate or mitigate identified environmental impacts (including any cumulative impacts) associated with the project and to reduce risks to human health and prevent the degradation of the environment. This should include an assessment of the effectiveness and reliability of the measures and any residual impacts after these measures are implemented. Appropriate Best Management Practices must be outlined.	Refer to **Part F** and **Part H**.
Air Quality	
The environmental outcome for the project should ensure: ▪ Emissions do not cause adverse impact upon human health or the environment.	Refer to **Section 6.5** and **Appendix 13**.
▪ Compliance with the requirements of the POEO Act and its associated regulations.	Refer to **Section 6.5** and **Appendix 13**.
▪ No offensive odours are caused or permitted from the premises.	Refer to **Section 6.5** and **Appendix 13**.
▪ Emissions of dust from the premises (including material handling, storage, processing, haul roads, transport and material transfer systems), are prevented or minimised.	
▪ Maintains or improves air quality to ensure National Environment Protection Measures for ambient air quality are not compromised.	
▪ All relevant guidelines in regard to ambient air quality are satisfied.	
The EIS must include an Air Quality Impact Assessment (AQIA) prepared in accordance with the EPA's "Approved Methods and Guidance for the Modelling & Assessment of Air Pollutants in NSW." The AQIA must describe the methodology used and any assumptions made to predict the impacts. Air pollutant emission	

Table 8 Environment Protection Authority's Key Issues for Assessment	
Environmental Assessment Requirements	**How Addressed**
rates, ambient air quality data and meteorological data used in the assessment must be clearly stated and justified.	
Emissions from all point sources are required to comply with the relevant Protection of the Environment Operations Clean Air Regulations 2010 standards of concentration. Using best practice and technology for control and mitigation of emissions, emission concentrations are expected to be well below these standards for certain pollutants.	
The AQIA must identify and describe in detail all possible sources of air pollution (including pollutants) and activities/processes with the potential to cause air pollutants beyond the boundary of any premises proposed to be licensed by an EPL. This should cover both the construction and operational phases of the development. Potential sources may include but not be limited to kiln/scrubber emissions, boiler emissions, crushing, storage, raw material handling and transport. The proponent must also provide expected emissions control performance efficiency of the proposed scrubber and kiln. Scrubber technology and performance efficiency should reflect international best practice and technology.	
The AQIA should include cumulative assessment considering the background air quality of the region and other significant nearby emissions sources. The cumulative assessment should also include any developments having been granted development consent, but which have not commenced.	
The proponent must include management, mitigation and control measures in the AQIA which are benchmark against best practice. Proponent must propose measures for the mitigation and particulate emissions from onsite activities including crushing, storage, raw material handling and transport. Enclosure of operations with particular emissions and other best practice measures should be proposed for the facility. Draft concept plans indicate the crusher will be enclosed which the proponent should confirm in the air quality assessment.	
The EIS should document any back up power supply systems including information on whether these will be operated with diesel or gas fired engines. Such activities must be undertaken in accordance with EPA's Interim Nitrogen Oxide Policy for Cogeneration in Sydney and the Illewarra.	
Water Quality	
The environmental outcome for the project should ensure: ▪ There is no pollution of waters (including surface and groundwater).	Refer to **Section 6.9** & **6.10** and **Appendix 8** & **9.**
▪ Wastewater is collected, treated and beneficially reused, where safe and practicable to do so.	
▪ The facility is connected to the existing municipal sewerage system and this system has capacity to cater for any increased loads. This includes any pipelines and pumping stations used to convey sewage generated.	
▪ Bunding is designed in accordance with the *"EPA's Bunding and Spill Management Guidelines".*	
The EIS should identify and describe all potential water discharges from the Site (including both construction and operational phases) that could result in potential pollution of waters. This should include a characterisation of potential water pollutants, receiving waters (including surface and groundwater) and any associated mitigation	

Table 8 Environment Protection Authority's Key Issues for Assessment	
Environmental Assessment Requirements	**How Addressed**
and management measures to achieve the above outcomes.	
The EIS should also demonstrate how the stormwater management system will satisfy relevant contemporary guidelines such as *Managing Urban Stormwater – Soils and Construction – Volume 2E Mines and Quarries* (DECC June 2008).	
Noise and Vibration	
The environmental outcome of the project should be to minimise adverse impacts due to noise from the project. The facility should be designed, constructed, operated and maintained so that there are no adverse impacts from noise (including traffic noise).	Refer to **Section 6.7** and **Appendix 12**.
The EIS must include a Noise Impact Assessment prepared in accordance with the NSW Noise Policy for Industry (NPfI). The assessment should include but need not be limited to the identification and assessment of all potential noise sources associated with the development, the location of all sensitive receptors, all operational configurations in each assessment time period (day, evening and night) and proposed hours of operation. The assessment should include all relevant details required by the NPfI, including an assessment of modifying factors such as low frequency noise according to NPfI, including an assessment of modifying factors such as low frequency noise according to NPfI Fact Sheet C. It should also include a detailed assessment of mitigation considered for the premises and a recommendation of reasonable and feasible mitigation to be applied, prior to assessing residual impacts, if any.	
The proponent should ensure that they adequately address the potential for cumulative industrial noise impacts from the existing sources, their own proposal and any approved or substantially proposed industrial sites. The proponent should establish the existing industrial noise contribution during the day, evening and night at relevant receivers to assist in establishing an appropriate project amenity level and potential cumulative industrial noise impacts. The proponent should also consider the need to measure existing industrial noise contributions as part of the initial surveys in line with NPfI Chapter 2.4, in light of the numerous existing and panned industrial sources in the vicinity of existing residential receivers.	
Noise from construction activities should be assessed against the Interim Construction Noise Guideline (DECC 2009). All feasible and reasonable noise mitigation measures to be implemented for any construction noise should be identified.	
As the project will be potentially traffic generating, the noise assessment should include an assessment of potential noise impacts arising from this traffic generating development in accordance with the *NSW Road Noise Policy (2011)* guidelines.	
Waste	
The goal of the development should be to ensure waste is managed: ▪ In accordance with the principles of the waste hierarchy and cleaner production. ▪ The handling, processing and storage of all materials used at the premises does not have negative environmental or amenity impacts. ▪ Land pollution is prevented.	Refer to **Section 6.12** and **Appendix 19**.

Table 8 Environment Protection Authority's Key Issues for Assessment	
Environmental Assessment Requirements	**How Addressed**
▪ The beneficial reuse of all wastes generated at the premises are maximised where it is safe and practical to do so. ▪ Any waste leaving the Site is transported and disposed of lawfully. ▪ No waste disposal occurs on site.	
All waste materials must be managed in accordance with the POEO Act 1997 and associated regulations and characterised in accordance with the EPA's Waste Classification Guidelines. If any waste materials posses hazardous characteristics, the EIS must provide details of how the waste will be treated or immobilised to render it suitable for transport and disposal.	Refer to **Section 6.12** and **Appendix 19**.
The proponent should also consult NSW *EPA's Better Practice Guidelines for Waste Management and Recycling in Commercial and Industrial Facilities* (DEC 2012). This guideline provides information on better waste management practice in design, establishment, operation and ongoing management of waste services in commercial and industrial developments.	Refer to **Section 6.12** and **Appendix 19**.
Contaminated Land Management	
The environmental outcome of the project is to ensure any contaminated land is identified and appropriately managed for the purpose of reducing the risk of harm to human health or any other aspect of the environment.	Refer to **Section 6.10** and **Appendix 8** & **9.**
In cases where land is potentially contaminated, the investigation and any remediation and validation work is to be carried out in accordance with the guidelines made or approved by the EPA under Section 105 of the *Contaminated Land Management Act 1997* and be in accordance with the requirements and procedures in the following: ▪ *Contaminated Land Management Act 1997* ▪ *Contaminated Land Management Regulation 2013* ▪ *SEPP* 55 - *Remediation of Land.* The involvement of an EPA-accredited Site Auditor should be considered during the contamination management process, including the provision of a Site Audit Statement certifying that the land is suitable for the proposed use(s).	Refer to **Sections 4.3** & **6.10** and **Appendix 8** & **9.**

Table 9 WaterNSW's Key Issues for Assessment	
Key Issues	**How Addressed**
General Requirements	
As the development is located within the Sydney Drinking Water Catchment, clauses 9(1) and (2) and 10(1) of the *State Environmental Planning Policy (Sydney Drinking Water Catchment) 2011* apply, the EIS must specifically address each of these clauses, in particular a clear explanation as to how the development would achieve a neutral or beneficial effect on water quality.	Refer to **Section 6.9** & **6.10** and **Appendix 8** & **9.**
The full description of the development and existing environment should also include those aspects which may have potential impacts on the quality and quantity of surface water and groundwater. This includes:	Refer to **Section 6.9** & **6.10** and **Appendix 8** & **9.**

Table 9 WaterNSW's Key Issues for Assessment	
Key Issues	**How Addressed**
▪ The plant design and layout, including temporary works and any construction staging; ▪ The raw materials conveyor belt layout from the quarry to the factory; ▪ Clarification of the method of transport of raw materials from the quarry to the factory; ▪ The proposed gully diversion and drainage channel; ▪ Details of riparian restoration works and implementation; ▪ The location, detailed design and operational management of any water quality management measures and structures; ▪ A description and location of all on-site water sources, including but not limited to dust suppression; ▪ A description and location of construction site amenities including any temporary on-site wastewater management systems, and ▪ The location and description of all proposed water monitoring locations/points (surface and ground waters).	
The EIS should include the following documents and plans to enable a complete and accurate assessment of potential water quality impacts: ▪ Concept Stormwater Management Plan including location and details of any stormwater management structures; ▪ Stormwater Quality Modelling (in MUSIC) demonstrating at least a 10% reduction in stormwater pollutants total suspended solids (TSS), total phosphorus (TP) and total nitrogen (TN) in post development compared to pre-development; ▪ Concept Soil and Water Management Plan(s) including detailed design, staging operation and maintenance of any clean and dirty water conveyance or treatment structures; ▪ Concept Riparian Vegetation Management Plan including details of implementation and staging; and ▪ Conceptual Operational Environmental Management Plan for any water quality control structures.	Refer to **Section 6.9** & **6.10** and **Appendix 8** & **9.**
WaterNSW requests that it be listed as a stakeholder in further consultation on this project and looks forward to reviewing the forthcoming Environmental Impact Statement.	Refer to **Section 6.9** & **6.10** and **Appendix 8** & **9.**

Table 10 Transport for New South Wales' Key Issues for Assessment	
Key Issues	**How Addressed**
General Requirements	
TfNSW notes the following: ▪ TfNSW input is requested by the Secretary under Schedule 2 of the *Environmental Planning and Assessment Regulation 2000*; ▪ The development would generate additional traffic. The impact of this traffic needs to be considered and adequately mitigated; and ▪ Berrima Road at this location is a classified regional road. Works on classified regional roads require consent from Council and concurrence from TfNSW under Section 138 of the Roacts Act, 1992.	Refer to **Section 6.11** and **Appendix 11**.
The Secretary's Environmental Assessment Requirements needs to address the following issues:	
▪ A detailed traffic impact study (TIS) is required to consider the implication of the development. As a guide Table 2.1 of the RTA Guide to Traffic Generating Developments outlines the key issues that may be considered in preparing a TIS. The TIS needs to include, but not be limited to: ○ Details on the type of vehicles using the Site, the likely daily and peak hour movements in/out of the Site (including staff movements), the likely distribution of these movements (i.e. which direction they are coming from/going to, which routes they are taking) and the expected duration of the operation (and associated traffic movements). This includes existing movements and proposed additional movements; ○ The traffic study needs to consider existing traffic volumes (based on survey) and the likely impact of additional traffic associated with the Proposed Development including the suitability of the existing intersections against Austroads standards, the associated need for road upgrades. Intersection traffic modelling may be required once traffic generation and transport routes are clarified.	Refer to **Section 6.11** and **Appendix 11**.
▪ A strategic design for any identified road upgrades on the State road network needs to be prepared to clarify the scope of works, demonstrate the works can be constructed within the road reserve and allow the consent authority to consider any environmental impacts of the works as part of their assessment. These impacts include traffic and road safety impacts as well as other impacts such noise, flora and fauna, heritage and impact to community.	Refer to **Section 6.11** and **Appendix 11**.

Table 11 Department of Primary Industries – Biodiversity & Conservation Division Environment, Energy and Science	
Key Issues	**How Addressed**
Attachment A – Standard Environmental Assessment Requirements	
Biodiversity	
1. Biodiversity impacts related to the proposed [development/project] are to be assessed in accordance with the Biodiversity Assessment Method and documented in a Biodiversity Development Assessment Report (BDAR). The BDAR must include information in the form detailed in the *Biodiversity Conservation Act 2016* (s6.12), *Biodiversity Conservation Regulation 2017* (s6.8) and Biodiversity Assessment Method.	Refer to **Section 6.6** and **Appendix 14-16**.
2. The BDAR must document the application of the avoid, minimise and offset framework including assessing all direct, indirect and prescribed impacts in accordance with the Biodiversity Assessment Method.	Refer to **Section 6.6** and **Appendix 14-16**.
3. The BDAR must include details of the measures proposed to address the offset obligation as follows: ▪ The total number and classes of biodiversity credits required to be retired for the development/project; ▪ The number and classes of like-for-like biodiversity credits proposed to be retired; ▪ The number and classes of biodiversity credits proposed to be retired in accordance with the variation rules; ▪ Any proposal to fund a biodiversity conservation action; ▪ Any proposal to conduct ecological rehabilitation (if a mining project); and ▪ Any proposal to make a payment to the Biodiversity Conservation Fund. If seeking approval to use the variation rules, the BDAR must contain details of the reasonable steps that have been taken to obtain requisite like-for-like biodiversity credits.	Refer to **Section 6.6** and **Appendix 14-16**.
4. The BDAR must be prepared by a person accredited in accordance with the Accreditation Scheme for the Application of the Biodiversity Assessment Method Order 2017 under s6.10 of the *Biodiversity Conservation Act 2016*.	Refer to **Section 6.6** and **Appendix 14-16**.
Aboriginal cultural heritage	
5. The EIS must identify and describe the Aboriginal cultural heritage values that exist across the whole area that will be affected by the project and document these in the EIS. This may include the need for surface survey and test excavation. The identification of cultural heritage values should be guided by the *Guide to investigating, assessing and reporting on Aboriginal Cultural Heritage in NSW* (DECCW, 2011) and consultation with DPIE Biodiversity & Conservation Division regional branch officers.	Refer to **Section 6.15** and **Appendix 22** & **23**.
6. Where Aboriginal cultural heritage values are identified, consultation with Aboriginal people must be undertaken and documented in accordance with the *Aboriginal cultural heritage* consultation *requirements for proponents 2010* (DECCW). The significance of cultural heritage values for Aboriginal people who have a cultural association with the land must be documented in the EIS.	Refer to **Section 6.15** and **Appendix 22** & **23**.

Table 11 Department of Primary Industries – Biodiversity & Conservation Division Environment, Energy and Science	
Key Issues	**How Addressed**
7. Impacts on Aboriginal cultural heritage values are to be assessed and documented in the EIS. The EIS must demonstrate attempts to avoid impact upon cultural heritage values and identify any conservation outcomes. Where impacts are unavoidable, the EA must outline measures proposed to mitigate impacts. Any objects recorded as part of the assessment must be documented and notified to DPIE Biodiversity & Conservation Division.	Refer to **Section 6.15** and **Appendix 22** & **23**.
Water and Soils	
8. The EIS must map the following features relevant to water and soils including: a. Acid sulfate soils (Class 1, 2, 3 or 4 on the Acid Sulfate Soil Planning Map). b. Rivers, streams, wetlands, estuaries (as described in s4.2 of the Biodiversity Assessment Method). c. Wetlands as described in s4.2 of the Biodiversity Assessment Method. d. Groundwater. e. Groundwater dependent ecosystems. f. Proposed intake and discharge locations.	Refer to **Section 6.9** & **6.10** and **Appendix 8** & **9.**
9. The EIS must describe background conditions for any water resource likely to be affected by the project, including: a. Existing surface and groundwater. b. Hydrology, including volume, frequency and quality of discharges at proposed intake and discharge locations. c. Water Quality Objectives (as endorsed by the NSW Government http://www.environment.nsw.gov.au/ieo/index.htm) including groundwater as appropriate that represent the community's uses and values for the receiving waters. d. Indicators and trigger values/criteria for the environmental values identified at (c) in accordance with the ANZECC (2000) Guidelines for Fresh and Marine Water Quality and/or local objectives, criteria or targets endorsed by the NSW Government.	Refer to **Section 6.9** & **6.10** and **Appendix 8** & **9.**
10. The EIS must assess the impacts of the project on water quality, including: a. The nature and degree of impact on receiving waters for both surface and groundwater, demonstrating how the project protects the Water Quality Objectives where they are currently being achieved, and contributes towards achievement of the Water Quality Objectives over time where they are currently not being achieved. This should include an assessment of the mitigating effects of proposed stormwater and wastewater management during and after construction. b. Identification of proposed monitoring of water quality or required changes to existing monitoring programs.	Refer to **Section 6.9** & **6.10** and **Appendix 8** & **9.**
11. The EIS must assess the impact of the development on hydrology, including: a. Water balance including quantity, quality and source. b. Effects to downstream rivers, wetlands, estuaries, marine waters and floodplain areas.	Refer to **Section 6.9** & **6.10** and **Appendix 8** & **9.**

Table 11 Department of Primary Industries – Biodiversity & Conservation Division Environment, Energy and Science	
Key Issues	**How Addressed**
c. Effects to downstream water-dependent fauna and flora including groundwater dependent ecosystems. d. Impacts to natural processes and functions within rivers, wetlands, estuaries and floodplains that affect river system and landscape health such as nutrient flow, aquatic connectivity and access to habitat for spawning and refuge (e.g. river benches). e. Changes to environmental water availability, both regulated/licensed and unregulated/rulesbased sources of such water. f. Mitigating effects of proposed stormwater and wastewater management during and after construction on hydrological attributes such as volumes, flow rates, management methods and re-use options. g. Identification of proposed monitoring of hydrological attributes.	
Flooding	
12. The EIS must map the following features relevant to flooding as described in the Floodplain Development Manual 2005 (NSW Government 2005) including: a. Flood prone land. b. Flood planning area, the area below the flood planning level. c. Hydraulic categorisation (floodways and flood storage areas).	Refer to **Section 6.9** & **6.10** and **Appendix 8** & **9.**
13. The EIS must describe flood assessment and modelling undertaken in determining the design flood levels for events, including a minimum of the 1 in 10 year, 1 in 100 year flood levels and the probable maximum flood, or an equivalent extreme event.	Refer to **Section 6.9** & **6.10** and **Appendix 8** & **9.**
14. The EIS must model the effect of the proposed project (including fill) on the flood behaviour under the following scenarios: a. Current flood behaviour for a range of design events as identified in 11 above. This includes the 1 in 200 and 1 in 500 year flood events as proxies for assessing sensitivity to an increase in rainfall intensity of flood producing rainfall events due to climate change.	Refer to **Section 6.9** & **6.10** and **Appendix 8** & **9.**
15. Modelling in the EIS must consider and document: b. The impact on existing flood behaviour for a full range of flood events including up to the probable maximum flood. c. Impacts of the development on flood behaviour resulting in detrimental changes in potential flood affection of other developments or land. This may include redirection of flow, flow velocities, flood levels, hazards and hydraulic categories. d. Relevant provisions of the NSW Floodplain Development Manual 2005.	Refer to **Section 6.9** & **6.10** and **Appendix 8** & **9.**
16. The EIS must assess the impacts on the proposed project on flood behaviour, including:	Refer to **Section 6.9** & **6.10** and

Table 11 Department of Primary Industries – Biodiversity & Conservation Division Environment, Energy and Science	
Key Issues	**How Addressed**
a. Whether there will be detrimental increases in the potential flood affectation of other properties, assets and infrastructure. b. Consistency with Council floodplain risk management plans. c. Compatibility with the flood hazard of the land. d. Compatibility with the hydraulic functions of flow conveyance in floodways and storage in flood storage areas of the land. e. Whether there will be adverse effect to beneficial inundation of the floodplain environment, on, adjacent to or downstream of the Site. f. Whether there will be direct or indirect increase in erosion, siltation, destruction of riparian vegetation or a reduction in the stability of river banks or watercourses. g. Any impacts the development may have upon existing community emergency management arrangements for flooding. These matters are to be discussed with the SES and Council. h. Whether the proposal incorporates specific measures to manage risk to life from flood. These matters are to be discussed with the SES and Council. i. Emergency management, evacuation and access, and contingency measures for the development considering the full range or flood risk (based upon the probable maximum flood or an equivalent extreme flood event). These matters are to be discussed with and have the support of Council and the SES. j. Any impacts the development may have on the social and economic costs to the community as consequence of flooding.	**Appendix 8** & **9.**
Attachment B – Project Specific Environmental Assessment Requirements	
Aboriginal Cultural Heritage	
A. The assessment of cultural heritage values must include a surface survey undertaken by a qualified archaeologist in areas with potential for subsurface Aboriginal deposits. The result of the surface survey is to inform the need for targeted test excavation to better assess the integrity, extent, distribution, nature and overall significance of the archaeological record. The results of surface surveys and test excavations are to be documented in the EIS.	Refer to **Section 6.15** and **Appendix 22** & **23**.
B. The EIS must outline procedures to be followed if Aboriginal objects are found at any stage of the life of the project to formulate appropriate measures to manage unforeseen impacts.	Refer to **Section 6.15** and **Appendix 22** & **23**.
C. The EIS must outline procedures to be followed in the event Aboriginal burials or skeletal material is uncovered during construction to formulate appropriate measures to manage the impacts to this material.	Refer to **Section 6.15** and **Appendix 22** & **23**.

Table 11 Department of Primary Industries – Biodiversity & Conservation Division Environment, Energy and Science	
Key Issues	**How Addressed**
D. A draft Aboriginal Heritage Management Plan (AHMP) should be prepared in parallel with the EIS. The AHMP must be prepared in consultation with the Registered Aboriginal Parties and must be based on the results of the archaeological assessment (including test excavation results).	Refer to **Section 6.15** and **Appendix 22** & **23**.
Flooding	
E. In addition to flooding, consideration of the proposed stream realignments within the Site should include an assessment of the impact on the natural stream functions including the geomorphic stability both upstream and downstream. This should include the proposed stream treatment (channel and riparian zone) and ongoing management and monitoring for both on and off site impacts.	Refer to **Section 6.9** & **6.10** and **Appendix 8** & **9.**

Table 12 Department of Primary Industries – Agriculture's Key Issues for Assessment	
Key Issues	**How Addressed**
Site Suitable for Development	
▪ Detail that the proposal is consistent with strategic plans and zone requirements; ▪ Complete a Landuse Conflict Risk Assessment (LUCRA) to identify potential landuse conflict, in particular relating to separation distances and management practices to minimise odour, dust and noise from sensitive receptors. A LUCRA is described in the DPI Land Use Conflict Risk Assessment Guide; and ▪ Include a map to scale showing the above operational and infrastructure details including separation distances from sensitive receptors.	Refer to **Sections 4.4**, **Table 5** in **Section 4.2**, **Section 6.19**.
Consideration for Impacts to Agricultural Resources and Land	
▪ Describe the current and potential *Important Agriculture Land in the* surrounding locality including the land capability and agricultural productivity; and ▪ Demonstrate that all significant impacts on current and potential agricultural developments and resources can be reasonably avoided or adequately mitigated.	Refer to **Sections 2.3**, **2.4** and **6.19**.
Bushfire Risk Identified and Managed	
▪ Risk assessment level and mitigation plan developed to address bush fire risk.	Refer to **Section 6.8** and **Appendix 8**.
Suitable and Secure Water Supply	
▪ Outline any impacts to agricultural water use and mitigation measures if required.	Refer to **Section 6.9** & **6.10** and **Appendix 8** & **9.**
Surface & Groundwater Protected	
▪ Proposed Development design, operation and by-product management should be undertaken to avoid nutrient and sediment build up and minimise erosion, off site surface water movement and groundwater accession.	Refer to **Section 6.9** & **6.10** and **Appendix 8** & **9.**

Table 12 Department of Primary Industries – Agriculture's Key Issues for Assessment	
Key Issues	**How Addressed**
Biosecurity Standards Met	
▪ Include a biosecurity (pests, weeds and disease) risk assessment outlining the likely plant, animal and community risks as per guidelines in Attachment 2. ▪ Develop a biosecurity response plan to deal with identified risks as well as contingency plans for any failures. Including monitoring and mitigation measures in weed, disease and pest management plans.	Refer to **Section 6.9** & **6.10** and **Appendix 8** & **9.**
Suitable Traffic Movements	
▪ Consideration of the route for movements needs to be taken into account so that impacts on sensitive receptors are minimised (eg noise, dust, volume of traffic). This should include consideration of Travelling Stock Reserves1 (TSR) and the movement of livestock or farm vehicles along / across the affected roads.	Refer to **Section 6.11** and **Appendix 11**.
Visual Amenity Achieved	
▪ Amenity impacts are assessed and any necessary response to mitigate visual impacts is described and illustrated.	Refer to **Section 6.3** and **Appendix 7**.
Adequate Consultation with Community	
▪ Consult with relevant agencies such as on the design, construction and operation of the proposed infrastructure; ▪ Consult with the owners / managers of affected and adjoining neighbours and agricultural operations in a timely and appropriate manner about; the proposal, the likely impacts and suitable mitigation measures or compensation; and ▪ Establish a complaints register that includes reporting and investigating procedures and timelines, and liaison with Council in relation to complaint issues.	Refer to **Section 5.2** and **Appendix 26**.

5.2 STAKEHOLDER CONSULTATION

Table 7 in **Section 5.1** lists the stakeholders which were required to be consulted with as per the SEARs issued by DPIE. These include:

- Environment Protection Authority;
- Wingecarribee Shire Council;
- Department of Planning, Industry and Environment (Environment, Energy & Science);
- Transport for New South Wales;
- Water New South Wales;
- Department of Primary Industries;
- NSW Fire and Rescue; and
- Local community and other stakeholders.

Given that both titles M(MO)L6 and 5611 are held by The Austral Brick Company Pty Ltd (which is a related company of Austral Masonry (NSW) Pty Ltd), it was considered unnecessary to engage in formal consultation with the holder of those two (2) titles.

Ongoing consultation has occurred to date, forming part of the overall community and stakeholder participation strategy. This included a Planning Focus Meeting, which was held on 7 November 2019 at the Bowral Brickworks site at Kiama Street, Bowral. The purpose of this meeting was to discuss any key issues with the relevant State Agencies for the project. The Planning Focus Meeting also included a Site Meeting, which sought to provide an overview of the existing Brickworks operations by virtue of a tour around the Bowral site. An additional Site Meeting was undertaken at the Subject Site for contextual purposes.

The State Agencies whom attended the Planning Focus Meeting included:

- NSW EPA.
- OEH (now EES Group).
- Wingecarribee Shire Council.
- WaterNSW.
- NSW DPIE.

The key issues discussed throughout the Planning Focus Meeting are outlined as follows:

1. Vegetation clearing to facilitate the Proposed Development.
2. Visual impact from the public realm.
3. Relationship with the existing quarry.
4. Air and noise quality impacts.

Accordingly, it is considered that the design for the Proposed Development (as submitted) has sought to respond to all of the matters discussed at the Planning Focus Meeting, along with those raised at the Community Consultation session held. The matters discussed throughout the consultation sessions are summarised below (refer to **Table 13** below) and discussed further in the Community Consultation Report (HillPDA, 2020) located in **Appendix 26** of this EIS, which has been collated in accordance with the requirements of the SEARs. The information provided hereunder demonstrates that legitimate consultation has taken place to ensure that all stakeholders are informed, and the Proposed Development is considered with respect to their requirements.

In response to the SEARs issued for the Proposed Development, the following consultation has been as detailed in Error! Reference source not found. below.

In the *Berrima Brickmaking Plant: Engagement Outcomes Report* (HillPDA, 2020), HillPDA note, that the Wingecarribee residents are a highly engaged community and are known (from previous engagement activities), to be strong advocates for retaining the rural character of the region, protecting native flora and fauna, whilst supporting local employment and economic growth (refer to **Appendix 26**).

The purpose of the community engagement undertaken by the Proponent and HillPDA (2020) was:

- To circulate information about the project to the community throughout the Proposal's preparation and assessment.
- To facilitate an open engagement process where the community are given meaningful opportunities to have their say across a variety of formats.
- To provide accessible opportunities for community participation, acknowledging and meeting the diverse needs of the Wingecarribee community.
- To present outcomes from the engagement in a format that can be used to inform the preparation of the SSD Application.

The engagement approach sought to identify key community insights in relation to the Proposed Development as identified in **Figure 19** below.

Stakeholders	Level 1 | Inform To provide and receive balanced and objective information	Level 2 | Consult To obtain feedback on analysis, issues, alternatives and decisions.
Tier 1		Targeted conversations **Who –** direct neighbouring properties **How –** one-on-one phone conversations
Tiers 2 and 3	Newsletter distribution **Who –** direct neighbouring properties and those on key transport routes **How** – quarterly or triannual newsletter with project updates and details of consultation sessions Newspaper advertisement **Who –** General public of nearby townships (New Berrima, Berrima, Moss Vale) **How** – invite submissions and advertise information sessions	Community Information sessions **Who –** General public of nearby townships (New Berrima, Berrima, Moss Vale) **How –** pop-up stall at local shopping village (Moss Vale)

Source: adapted from IAP2 consultation framework

Figure 19 Consultation Spectrum (Source: HillPDA, 2020)

Community stakeholders were divided into three (3) groups dependent on the level of potential impact from the Proposal, which include:

- Tier 1 stakeholders are those with the potential to be immediately affected by the Proposal.
- Tier 2 stakeholders are those with the potential to be indirectly affected by the Proposal. Tier 2 stakeholders are primarily residents of New Berrima and residents and businesses fronting onto Taylor Avenue and Berrima Road that share road movement corridors.
- Tier 3 stakeholders are the general community who may be indirectly affected by the Proposal.

Accordingly, stakeholders for each tier are conceptually illustrated within **Figure 20** below.

Figure 20 Project Context and Potential Stakeholders (Source: HillPDA, 2020)

With regard to **Figure 20** above, Tier 1 stakeholders were identified as occupants of neighbouring properties and residents in the surrounds as follows:

- Residents of New Berrima.
- Community Consultation Committee (existing for Boral Cement Works).
- Boral Cement Works.
- Inghams Enterprises.
- Cromford Pipe.
- Sports Ground Users (Blue Wren Campervan and Motorhome Club of Australia).
- Berrima Clay Target Club.
- Illawarra Aboriginal Land Council.
- Tobas Archery.

Several engagement methods were utilised to ensure each stakeholder group was catered to in a way that enabled them the opportunity to provide meaningful feedback for the project. The primary methods of engagement were:

- One-on-one conversations.
- Two (2) community information sessions.
- Newsletter / flyer delivery inviting submission.
- Questionnaire survey distributed during the community information sessions.

HillPDA (2020) confirm that the newsletter was distributed to the New Berrima residential community of which there are approximately 150 residences. It is noted, that the residences of this township typically retrieve their mail from the New Berrima General Store whom provide the mail services to the wider community, 50 of which were provided with a copy of the printed newsletter. The General Store also displayed a copy of the newsletter to allow residents and passersby the opportunity to peruse the information. Additional newsletters were distributed to the tier 1 stakeholders identified above.

Furthermore, a 1/8th page advertisement was featured in the Southern Highlands News on 28 February 2020 and 4 March 2020, for which four (4) formal written submissions were received and have been considered in **Table 13** below.

HillPDA (2020) note, that approximately 45 people attended the "drop-in" sessions with 31 leaving their contact details demonstrating interest in any additional information that may be distributed in the future. A survey was also distributed during the "drop-in" sessions, which gave the community member the opportunity to provide their direct feedback on the Proposal. 15 of which completed the survey.

As a result of the community and stakeholder engagement and participation strategy, **Table 13** outlined below summarises the key issues and concerns, which are further detailed within **Part F** of this EIS.

Table 13: Key Issues Raised in Order of Frequency Raised

Frequency (Highest to Lowest	Key Items	Concerns Raised by Community
1	Vegetation	▪ Clearly define 'Riparian'. ▪ Reiterate the riparian zone as an area of vegetation; suggest updating colours of riparian zone on plans to a green colour. ▪ Provide a more detailed landscape plan highlighting tree retention, removal and where replacement will happen. ▪ Consider further planting of the northern and eastern boundary of the Site – where feasible.
2	Noise	▪ Reiterate truck movement operational hours (5am – 5pm). ▪ Convey (in more detail) the operating hours of the facility and that kilns are the only thing operating 24/7. ▪ Highlight any traffic noise mitigation measures. ▪ Reiterate through messaging, that the facility is internalised and that machinery is state of the art (new technology). ▪ Reiterate that operational noise is within EPA thresholds.
3	Dust	▪ Reiterate that raw materials will only be transported from the neighbouring quarry to the brickworks and not on local roads (once the new quarry is operational). ▪ All raw materials handling and brickmaking is undertaken indoors. ▪ Confirm if covers will be placed on raw materials while they are being transported. ▪ Make clear that the access road will be sealed prior to truck movements. ▪ Highlight any water treatment measures to ensure run off is not polluting the natural water courses.
4	Sustainability	▪ Detail sustainability measures and the decision-making process, i.e. solar roof panels provide energy that can be used on-site, green roof has structural and maintenance implications.
5	Visual	▪ Reiterate the evening operations will be just the kiln and minor works, which occur indoors. ▪ Consider providing a light spill plan demonstrating where lightings will be used during evening operations, highlighting the absence of flood lighting on the storage yard.

6	Social	▪ Reiterate key messaging around local employment opportunities on-site. ▪ Note, if it is the case, that existing Brickworks employees would be transferred to the new location.
7	Heritage	▪ Reiterate Aboriginal Cultural Heritage unexpected finds protocol. ▪ Reiterate actions being implemented to avoid / preserve Aboriginal Cultural Heritage items.
8	General	▪ Provide an indicative progress diagram, showing each step in the application process. ▪ Taylor Avenue roundabout has been put on hold by Council due to "project delivery and funding challenges", the project will be "shovel ready" for future grant applications.
9	Support	▪ Highlight economic merits of the Proposal, including support for local retailers. ▪ Highlight the reduction of truck movements between the new quarry and old brickmaking facility.

PART F ENVIRONMENTAL RISK ASSESSMENT

6.1 SECRETARY'S ENVIRONMENTAL ASSESSMENT REQUIREMENTS

The SEARs were issued on 11 February 2020. The Key Issues identified, which require consideration include:

1. Community and Stakeholder Engagement;
2. Strategic Context;
3. Air Quality;
4. Noise;
5. Traffic and Transport;
6. Visual;
7. Greenhouse Gas;
8. Soils and Water;
9. Waste Management;
10. Biodiversity;
11. Bushfire and Incident Management;
12. Heritage and Aboriginal Cultural Heritage;
13. Hazards; and
14. Cumulative Impacts.

The above matters are addressed in the sections below.

6.2 STRATEGIC CONTEXT

Sections 2.3 and **4.4** above have previously considered the Proposed Development's strategic and statutory context.

Furthermore, the Proposed Development, for the purposes of a Brickworks Plant is considered to be consistent with the intended development of industrial land within the Wingecarribee LGA. The Proposed Development would enable the efficient and sustainable use of such designated industrial land via adherence to the provisions and overarching aims and objectives of the IN1 General Industrial zoned land (including the adjoining E3 Environmental Management zoned land), as set out within the WLEP2010 that allows for the construction and operational use of brick manufacturing plants (refer to **Table 5** of this EIS). The Proposed Development would beneficially contribute to the regional and local economies, and population groups positioned in the wider locality.

The Proposed Development is considered compatible with surrounding industrial land uses (western, southern and eastern interfaces), including similar manufacturing facilities, that are designated for such employment-generating land uses of similar and parallel nature within the Wingecarribee LGA. The Subject Site is not located in proximity of any residential development or other sensitive land uses; therefore, would not exhibit any adverse environmental or amenity impacts. It is noted, that to the north of the Site there is identified Environmental zoned (E2 Environmental Conservation & E3 Environmental Management), as well as potential impacts pertaining to bushfire prone land, Aboriginal Cultural Heritage and biodiversity impacts, for which are further analysed in the respective consultant reports in **Sections 6.6, 6.8** & **6.15** of this EIS. Accordingly, any recommendations drawn from these reports would be adopted and adhered to.

The proposed site layout and building design would ensure the functional operation of the proposed Brickworks Plant in accordance with the operational needs of the end user, whilst not impacting on any other operations. Similarly, the Site and built form have been designed in respect of the planned / existing road infrastructure, noting its direct linkages to the wider regional road network, including Berrima Road, Hume Highway and the Old Hume Highway.

As mentioned above, the Proposed Development would not exhibit any significant environmental impacts and would not adversely impact on the amenity or operations of any adjoining sites within close proximity to the Subject Site. Therefore, the Proposed Development would be considered compatible with the Site's strategic and statutory context.

6.3 URBAN DESIGN AND VISUAL

A *Landscape and Visual Impact Assessment Report* (Geoscapes, 2020) has been prepared in support of the Proposed Development and is included as **Appendix 7**.

Visual Impact Assessments within NSW do not follow prescribed methods or criteria. Rather, this assessment is based on the principles established and broad approaches recommended in the following documents:

- *Guidelines for Landscape and Visual Impact Assessment* (GLVIA) – Third Edition (LI/IEMA 2013); and
- *The Landscape Institute Advice Note 01 (2011) Photography and Photomontage in Landscape and Visual assessment*.

In accordance with GLVIA3, visual assessment methodology is tailored to the specific requirements of each Proposed Development, its specific landscape context and likely significant effects. The methodology used to assess the Proposed Development reflects the principal ways in which the Proposed Development is considered likely to interact with existing landscape and visual conditions.

The Proposed Development site is situated close to the east of New Berrima. It is located approximately 50 kilometres west of Wollongong. The precinct already contains Boral Cement Works and some adjacent lands are zoned IN1 General Industrial. It has tributaries of Stony Creek running through it and is within a bushfire zone. The Site is surrounded by the following specific land uses:

- Directly north of the Site is agricultural lands, an existing quarry access road and a historic shooting club (previously used as a military training range during WWI and WWII). Further north is Wingecarribee River which is a tourist attraction for walkers;
- Directly south of the Site is rural land uses zoned IN1 and the Blue Circle Rail Line;
- Directly to the east are agricultural land used zoned IN1, further east is town of Burradoo; and
- Directly west of the Site are agricultural land uses zoned IN1 and the town of New Berrima.

The landscape character of the area can be described as being generally agricultural and rural with an influence of industrial development. It has high scenic qualities with rolling hillsides, changes in topography with natural rivers and bushland. Previous uses of the Site have involved man-made interventions with cattle farming. There are also are no current statutory designations within the WLEP 2010 which attribute landscape or environmental value to the Site.

A significant local value may be held by visual receptors with high sensitivity and residential properties which are in close proximity to the Site. These views are likely to be based on perceptual aspects such as wilderness, tranquillity, land use, environmental value and green open space.

The main building within the Proposed Development would have a ridge height of 16m AGL (681.00 RL). The raw material storage building and surge bins would have a higher ridge height at 20m AGL (685.00 RL), whereas the stack would extend to a height of 35 m. The height and scale of the Proposed Development has been addressed by siting the building

as close to existing grade as possible, placing the building to the east of the Site and providing a large amount of landscape area to provide screening.

The colours, materials and finishes of the Proposed Development have been selected to address height and scale. Metal profiled cladding and sheeting would be used in a palette of greys. The office building would be constructed using Boral bricks, assisting to recess the building behind onsite landscaping and to blend into the skyline.

The landscape design of the Proposed Development is intended to be sympathetic to the surrounding character of the area. Large areas of existing vegetation are intended to be retained. This would be strengthened by planting additional species which are locally indigenous such as the Southern Highlands Shale Forest. Trees, which would be scattered in isolated groups similar to plantings currently present onsite. A riparian corridor exists to the south of the Site, which would be planted with a fully structured riparian buffer (refer to **Appendix 5** for further details).

As state and local zoning dictates, lands in the surrounding area are either for industrial or enterprise uses, the nature of the Proposed Development would not contradict the future character of the area. **Appendix 5** provides the Landscape Plans which were used to supplement the *Landscape and Visual Impact Assessment Report* (refer to **Appendix 7**). The Proposed Development's landscape design is intended to respond to local character in the use of endemic plant species to maintain and increase biodiversity, and to provide visual mitigation to potential visual receivers.

Overall, it is considered that the Proposed Development would be well-sited within its development boundary. The Site has a naturally rising topography in the east which would help to sit the main brickmaking facility lower within the landscape, further lessening its visual impact. Neutral colours and materials have also been selected to ensure the Proposed Development blends into its surrounding context.

The Site can be categorised as a being a relatively common receptor in fair condition. It is a landscape receptor with a moderate level of sensitivity to disturbance or change in character due to the development proposals, with some potential for substitution or replacement. Therefore, the baseline sensitivity of the current landscape is judged as being medium.

In formally assessing the potential visual impacts of the Proposed Development, photography to prepare photomontages was undertaken by Geoscapes using a Canon 60D (DSLR) camera. A 50 mm fixed focal length prime lens was attached to the Canon. Photomontages were thereafter prepared to create "simulated" views of the Proposed Development. Although these do not claim to exactly replicate what would be seen by the human eye, they provide a useful "tool" in analysing potential visual impacts from receptor locations. In instances where baseline photography was not possible, a Google Earth image showing the existing terrain and massing of the Proposed Development was utilised instead.

For the purposes of most Visual Impact Assessments, photomontages are taken to be the 'residual effects' of the development, representing those effects which are likely to remain on completion of the development, and which are to be given the greatest weight in planning terms. These photomontages have also attempted to incorporate completed landscaping at the Site.

Table 14 outlined below sets out the criteria which were used to assess the potential visual impacts of the Proposed Development.

Table 14 Landscape Assessment Criteria	
Category	**Definition**
Landscape Receptor Sensitivity	
Very High	▪ Nationally designated/valued landscape and landscape features; strong/distinctive landscape characteristics: absence of landscape detractors. Rare receptor in excellent condition; and ▪ A landscape receptor extremely sensitive to disturbance or change in character due to the development proposals. No potential or very limited potential for substitution or replacement.
High	▪ Locally designated valued landscape and features: many distinctive landscape characteristics: very few landscape detractors. Uncommon receptor in good condition; and ▪ A landscape receptor sensitive to disturbance or change in character due to the development proposals. Limited potential for substitution or replacement.
Medium	▪ Undesignated landscape and features: some distinctive landscape characteristics: few landscape detractors. A relatively common receptor in fair condition; and ▪ A landscape receptor with a moderate level of sensitivity to disturbance or change in character due to the development proposals. Some potential for substitution or replacement.
Low	▪ Undesignated landscape and features: few distinctive landscape characteristics: presence of landscape detractors. A common receptor in poor condition; and ▪ A landscape receptor with limited sensitivity to disturbance or change in character due to the development proposals. Clear potential for substitution or replacement.
Very Low	▪ Undesignated landscape and features: absence of distinctive landscape characteristics: presence of many landscape detractors. A common receptor in very poor condition; and ▪ A landscape receptor with very limited sensitivity to disturbance or change in character due to the development proposals. Good potential for substitution or replacement.
Landscape Receptor of Change Criteria	
Very High	▪ Total loss of or major alteration to key elements/features/characteristics of the baseline condition. Addition of elements which strongly conflict with the key characteristics of the existing landscape; and ▪ Large scale effects influencing several landscape types or character areas.
High	▪ Notable loss or alteration to on or more key elements/features/characteristics of the baseline condition. Addition of elements that are prominent and may conflict with the key characteristics of the of the existing landscape; and ▪ Effects at the scale of the landscape type or character areas within which the proposal lies.
Medium	▪ Partial loss or alteration to one or more key elements/features/characteristics of the baseline condition. Addition of elements that may be evident but do not necessarily conflict with the key characteristics of the of the existing landscape; and ▪ Effects within the immediate landscape setting of the Site.
Low	▪ Minor loss or alteration to one or more key elements/features/characteristics of the baseline condition. Addition of elements that may not be uncharacteristic within the existing landscape; and ▪ Effects at the Site level (within the development itself).

Table 14 Landscape Assessment Criteria	
Category	**Definition**
Very Low	▪ Very Low Barely discernible loss or alteration to one or more key elements/features/characteristics of the baseline condition. Addition of elements not uncharacteristic within the existing landscape; and ▪ Effects only experienced on parts of the Site at a very localised level.
Visual Receptor Sensitivity	
Very High	▪ Designed view to or from a heritage / protected asset. Key protected viewpoint e.g. interpretive signs. References in literature and art/or guidebooks and tourist maps. Protected view recognised in planning policy designation (SEPP, LEP and DCP); and ▪ Views from the main living space of residential properties, state public rights of way e.g. bush trails and state designated landscape feature with public access. Visitors to heritage assets of state importance.
High	▪ View of clear value but may not be formally recognised e.g. framed view of high scenic value from an individual private dwelling or garden. It may also be inferred that the view is likely to have value e.g. to local residents; and ▪ Views from the secondary living space of residential properties and recreational receptors where there is some appreciation of the landscape e.g. golf and fishing. Local public rights of way and access land. Road and rail routes promoted in tourist guides for their scenic value.
Medium	▪ View is not promoted or recorded in any published sources and may be typical of the views experienced from a given receptor. People engaged in outdoor sport where an appreciation of the landscape has little or no importance e.g. football and soccer. Road users on main routes (Motorway/Freeway/Highway) and passengers on trains.
Low	▪ View of clearly lesser value than similar views experienced from nearby visual receptors that may be more accessible. Road users on minor roads. People at their place of work or views from commercial buildings where views of the surrounding landscape may have some importance.
Very Low	▪ View affected by many landscape detractors and unlikely to be valued. People at their place of work or other locations where the views of the wider landscape have little or no importance.
Visual Receptor Magnitude of Change Criteria	
Very High	▪ There would be a substantial change to the baseline, with the Proposed Development creating a new focus and having a defining influence on the view. Direct views at close range with changes over a wide horizontal and vertical extent.
High	▪ The Proposed Development will be clearly noticeable and the view would be fundamentally altered by its presence. Direct or oblique views at close range with changes over a noticeable horizontal and or/vertical extent.
Medium	▪ The Proposed Development will form a new and recognisable element within the view which is likely to be recognised by the receptor. Direct or oblique views at medium range with a moderate horizontal and/or vertical extent of the view affected.
Low	▪ The Proposed Development will form a minor constituent of the view being partially visible or at sufficient distance to be a small component. Oblique views at medium or long range with a small horizontal/vertical extent of the view affected.

Table 14 Landscape Assessment Criteria	
Category	**Definition**
Very Low	▪ The Proposed Development will form a barely noticeable component of the view, and the view whilst slightly altered would be similar to the baseline situation. Long range views with a negligible part of the view affected.

Table 15 outlined below sets out the matrix for determining the significance of visual impacts to a particular receptor, by combining the location sensitivity with the predicted magnitude of change.

Table 15 Significance of Visual Impact Matrix						
Receptor for Sensitivity	**Magnitude of Change**					
		Very High	**High**	**Medium**	**Low**	**Very Low**
	Very High	Substantial	Major	Major/ Moderate	Moderate	Moderate/ Minor
	High	Major	Major/ Moderate	Moderate	Moderate/ Minor	Minor
	Medium	Major/ Moderate	Moderate	Moderate/ Minor	Minor	Minor Negligible
	Low	Moderate	Moderate/ Minor	Minor	Minor Negligible	Negligible
	Very Low	Moderate/ Minor	Minor	Minor Negligible	Negligible	Negligible/ None

Where a moderate or higher impact is predicted, this is considered to equate to a significant impact for the terms of development assessment purposes. All other effects would not be significant. In certain cases, where additional factors may arise, a further degree of professional judgement was applied when determining whether the overall change in the view or effect upon landscape receptor would be significant or not.

It is noted that, whilst visual effects are a subjective topic, Geoscapes has exercised its professional judgement in assessing the Proposed Development. Moreover, the significance of visual impacts are assessed against the Proposed Development in isolation only.

Geoscape undertook site inspections on 20 November 2019 and 21 February 2020 to inform its *Landscape and Visual Impact Assessment Report* (refer to **Appendix 7**). Figures 6 to 9 in **Appendix 7** show the panoramic photos taken at eye level. These eye level photographs demonstrate how the Site is well-enclosed by existing vegetation or topography. This would suggest that lower parts of the Proposed Development are likely to be well screened and would not be visible to the large majority of potential visual receivers. In order to gain a complete understanding of potential visibility, drone photography was used to take panoramic photographs looking north, south, east and west within the Site boundary. A height was flown by the drone to generally represent the building with the highest RL elevation within the Proposed Development (in this case the roof line of the raw material and storage building at 20m AGL). It is considered that this would represent a worst-case scenario and the maximum Zone of Visual Influence (refer to Figures 10 to 17 of **Appendix 7**). It is important to note that, whilst the stack does extend up to a height of 35 m, due to its size, any location from which the top 5m of the stack would be visible would not experience significant visual impacts.

The following representative receptors were considered suitable to represent the views experienced by more than one visual receptor, as it is acknowledged that the *Landscape and Visual Impact Assessment Report* (refer to **Appendix 7**) cannot capture absolutely every viewpoint of the Site:

- Receptor 1 - 441 Oxleys Hill Road, Berrima;
- Receptor 2 - Adjacent to 54 Carribee Road, Moss Vale;
- Receptor 3 - 524 Berrima Road, Berrima;
- Receptor 4 – New Berrima Sports Ground;
- Receptor 5 - Berrima Road Near Railway Crossing;
- Receptor 6 – Berrima Road Near Inghams Factory;
- Receptor 7 - 341 Oldbury Road, Sutton Forest;
- Receptor 8 – Douglas Road, Moss Vale; and
- Receptor 9 - 15 Carribee Road, Moss Vale.

Figure 21 below illustrates the locations of these representative receptors. These representative viewpoints that were chosen are intended to portray what a person of average height (175 m) would see whilst standing at the same location). These representative viewpoint photographs were then used to create photomontages.

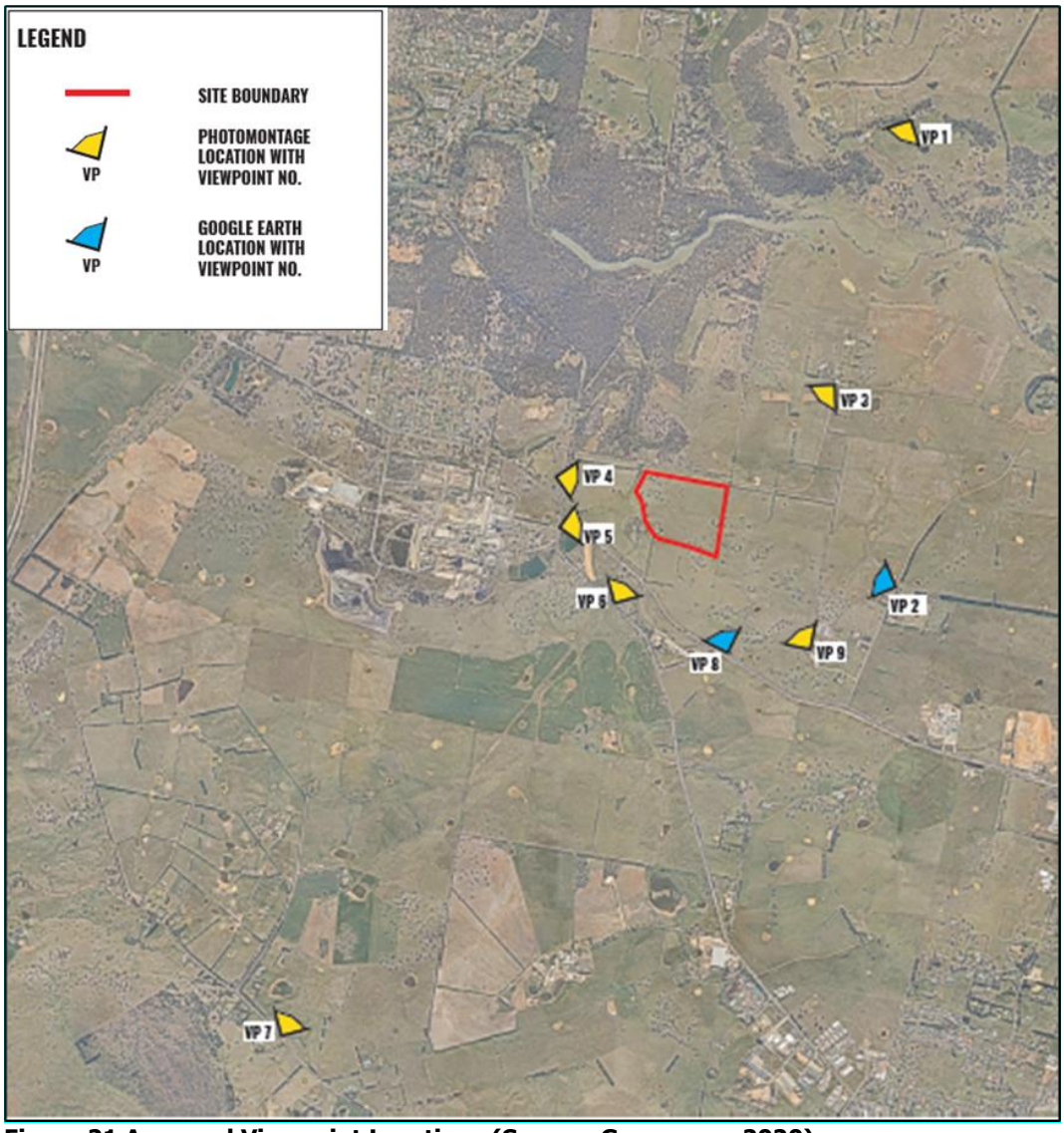

Figure 21 Assessed Viewpoint Locations (Source: Geoscapes, 2020)

In total, seven (7) of the viewpoints were assessed using photomontages, whereas two were selected for Google Earth Pro massing analysis.

The *Landscape and Visual Impact Assessment Report* (refer to **Appendix 7**) only identified Receptor 4 as having moderate/minor impacts as a result of the Proposed Development. Receptor 4, the New Berrima Sports Ground, is located 450 m the west of the Proposed

Development. It contains a cricket pitch and buildings used for amenities. The ground does not appear to be extensively used and is most likely frequented by dog walkers and used for occasional sporting activities. The baseline photograph was taken from the upper embankment which faces the pitch and is close to Berrima Road. In this elevated position, the development site is clearly seen, with Ingham's Enterprises to the far right of the image.

People using New Berrima Sports Ground generally would be involved in sporting activities, spectating or dog walking. The appreciation of the landscape for these user groups, may have little or no importance, however, the setting that the park is within, has some visually appealing qualities and there are elevated areas with views of the landscape. It is judged that the sensitivity for this receptor to the development would be medium.

Within the photomontage (refer to **Figure 22** below) it is clear that the Proposed Development would form a new and recognisible element within the landscape, which is likely to be recognised by Receptor 4. Existing vegetation within the foreground combined with new landscape planting, should help to recess the building and reduce visual impacts following maturity. Therefore, the magnitude of change is expected to be medium, with the overall significance of visual impacts at this location being moderate/minor.

Figure 22 Receptor 4 – Photomontage Looking East (Source: Geoscapes, 2020)

The following locations are predicted to experience minor visual impacts from the Proposed Development:

- Receptor 1 - 441 Oxleys Hill Road, Berrima;
- Receptor 7 - 341 Oldbury Road, Sutton Forest; and
- Receptor 9 - 15 Carribee Road, Moss Vale.

The following locations are predicted to experience minor negligible visual impacts from the Proposed Development:

- Receptor 5 - Berrima Road Near Railway Crossing; and
- Receptor 6 - Berrima Road, Near Inghams Factory.

Receptor 3 - 524 Berrima Road, Berrima is predicted to experience negligible visual impacts from the Proposed Development.

The following locations are predicted to have no visual impacts from the Proposed Development:

- Receptor 2 - Adjacent to 54 Carribee Road, Moss Vale; and
- Receptor 8 - Douglas Road, Moss Vale.

One location has been assessed as having moderate/minor visual impacts from the development, this is not considered to be significant visual impact.

Most importantly, none of the assessed visual impacts are identified to be significant. After considering the potential visual impacts of the Proposed Development alongside the recommended mitigation measures as well as the adjacent landscape's industrial/enterprise zoning, the magnitude of visual impact changes have been identified as medium. The significance of these identified impacts to the landscape are therefore considered to be moderate/minor. Although the Site does present visual scenic qualities, this has to be considered against the immediate surrounding industrially/enterprise zoned land. Indeed, the surrounding landscape character would continue to be influenced by industrial development into the future. Moreover, locations in very close proximity to the Site are judged to have lower sensitivity due to the type of user group.

6.4 SAFETY, SECURITY AND CRIME PREVENTION

The principles of Crime Prevention Through Environmental Design (CPTED) have been considered throughout the design of the Proposed Development.

The CPTED guidelines were prepared by the NSW Police in conjunction with NSW DPIE. CPTED provides a clear approach to crime prevention and focuses on the 'planning, design and structure of cities and neighbourhoods'. The main aim of the policy is to:

- Limit opportunities for crime;
- Manage space to create a safe environment through common ownership and encouraging the general public to become active guardians; and,
- Increase the perceived risk involved in committing crime.

The guidelines provide four (4) key principles to limit crime, including:

- Natural Surveillance;
- Access Control;
- Territorial Reinforcement; and,
- Space Management.

Principle 1 – Surveillance:

The attractiveness of crime targets can be reduced by providing opportunities for effective surveillance, both natural and technical.

- The Proposed Development would orientate active areas such as the ancillary offices and building entrances towards surrounding roads, pedestrian paths, car parking areas and deep-soil landscaping;
- The Proposed Development would utilise low lying landscaping in appropriate locations to ensure there would be no obstruction of surveillance opportunities; and,
- External lighting would enable the maintenance of sight-lines and surveillance after dark.

Principle 2 – Access Control:

Access Control can be defined as physical and symbolic barriers that are used to 'attract, channel or restrict the movement of people'.

- The Site would be secured by perimeter fencing and access gates to deter unauthorised access to the Site; and,
- Directional signage to heavy vehicle, car parking, pedestrian paths and building entries would define the various areas of the Site, providing legibility and minimising vehicular and pedestrian conflict with the Site.

Principle 3 – Territorial Reinforcement:

Territorial Reinforcement can be described as creating a sense of ownership to a public space or vicinity, encouraging the usage of that space. By increasing usage capability, this also deters crimes and further increases the chances of a crime being witnessed and reported in a timely manner.

- The provision of security-controlled entrances to the Site and proposed Brickworks Plant would emphasise the separation between the private and public domain; and,
- Well maintained landscape design would indicate the Proposed Development is well-used and cared for to reduce criminal activity.

Principle 4 – Space Management:

Space Management is intuitive of Principle 3 – Territorial Reinforcement – and, refers to ensuring a space is utilised and cared for appropriately.

- On the ground level, pathways and planters would be well maintained by a landscape contractor. Continued repairs and maintenance would discourage vandalism; and,
- High quality materials, varied façade treatments and landscaping along boundaries would assist in discouraging vandalism and graffiti.

The Proposed Development would successfully integrate the four (4) principles outlined to limit crime outlined in the CPTED guidelines, which are adopted into the MVECDCP2008.

6.5 AIR QUALITY

The *Proposed New Brick Factory (SSD 10422) – 416-524 Berrima Road, Moss Vale NSW 2577: Air Quality Impact Assessment* (Airlabs Environmental, 2020) considered the potential air quality impacts of the Proposed Development (refer to **Appendix 13**).

Accordingly, the Air Quality Impact Assessment (AQIA) was prepared in accordance with the Level 2 Impact Assessment requirements specified in the *Approved Methods for the Modelling and Assessment of Air Pollutants in NSW* (Approved Methods – NSW EPA, 2017). Holistically, from an operational air quality perspective, the proposed Brickworks plant would include the following key features, which would aim to reduce air quality and greenhouse gas emissions across the Site:

- New Kiln: The Proposed Development would incorporate a new plant, with a new kiln, which would improve fuel consumption and the emissions profile.

- Improvements to Hydrogen Fluoride (HF) Emissions from the Kiln Stack: HF is a key pollutant released to the atmosphere from brick manufacturing operations. To ensure that all necessary measures are being implemented to minimise the level of HF emissions released to the atmosphere. The Proposed Development would

implement best practice measures at the proposed facility site by proposing to limit the discharge concentration of HF from the kiln stack to a maximum of 20 mg/m^3, which is considerably lower than the 50 mg/m^3 as per the POEO Clean Air Regulation 2010 – Standards of Concentration, Schedule 3 – Ceramic Works.

- Stack Height: Height of the kiln stack is designed to be 35 m Above Ground Level (AGL) and well above the maximum height of the nearest buildings / structures (with the maximum buildings attaining a height of approximately 20 m), so as to avoid wake effects and improve pollutant dispersion.

- Enclosed Operations to Minimise Fugitive Dust: Raw materials from the Austral Bricks Quarry would be unloaded inside a building, which substantially minimises the potential for wind erosion emissions from stockpiles. Similarly, the crusher would be located in an enclosure which would limit fugitive dust emissions released to the atmosphere.

- Sealed Haulage Surfaces: Access / service roads within the Subject Site proposed to be utilised by haul trucks for delivering raw material and transporting product material would be paved, which would limit the potential for wheel generated dust when compared to haulage on unsealed roads.

The nearest sensitive receiver locations are outlined in **Table 16** as follows and identified in **Figure 23** below.

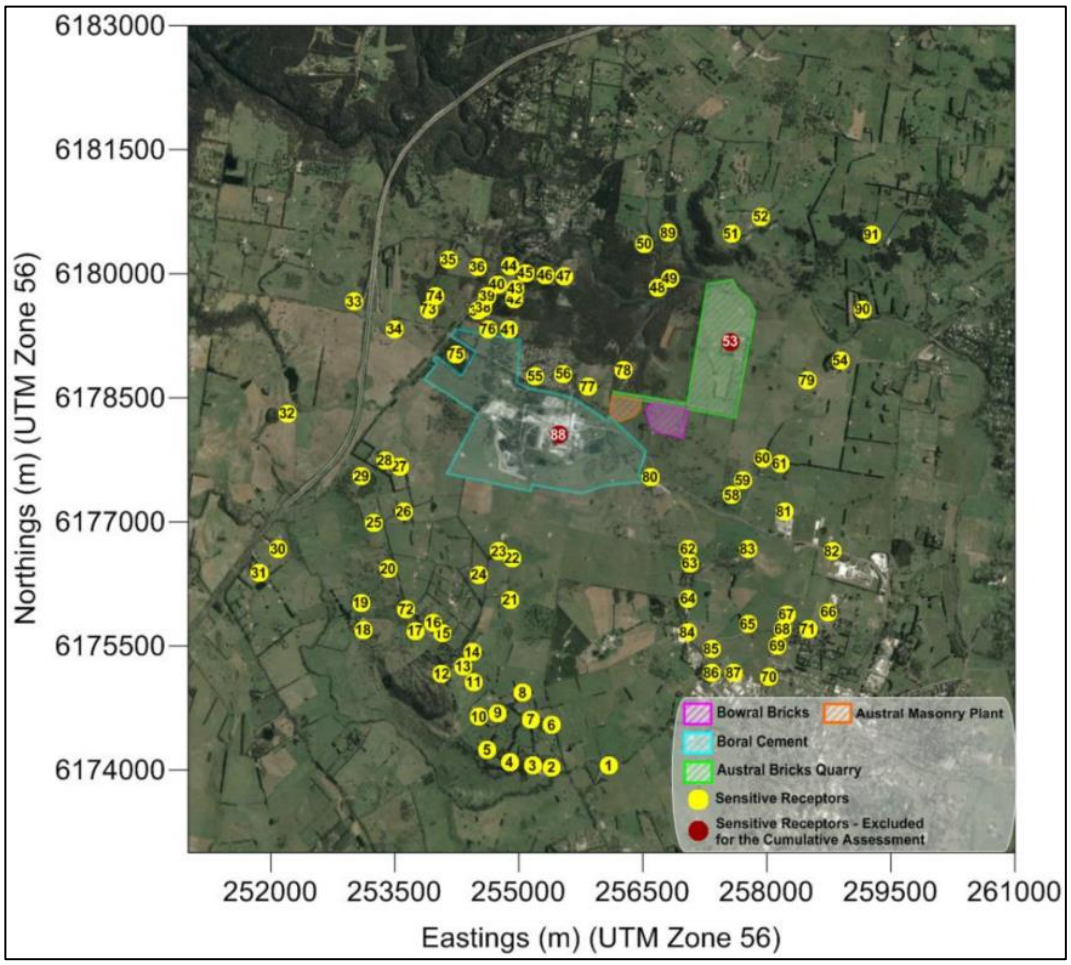

Figure 23 Location of the Identified Sensitive Receptors (Source: Airlabs Environmental, 2020)

Table 16: Details of Identified Sensitive Receptors			
Receptor ID	**Receptor Type**	**Eastings (m) UTM Zone 56**	**Northings (m) UTM Zone 56**
1	Residential Dwelling	254880	6174050
2	Residential Dwelling	255400	6174030
3	Residential Dwelling	255170	6174050
4	Residential Dwelling	254890	6174090
5	Residential Dwelling	254620	6174240
6	Residential Dwelling	255400	6174540
7	Residential Dwelling	255150	6174610
8	Residential Dwelling	255050	6174930
9	Residential Dwelling	254750	6174690
10	Residential Dwelling	254520	6174640
11	Residential Dwelling	254460	6175060
12	Residential Dwelling	254070	6178060
13	Residential Dwelling	254330	6175250
14	Residential Dwelling	254440	6175420
15	Residential Dwelling	254080	6175650
16	Residential Dwelling	253970	6175780
17	Residential Dwelling	253750	6175680
18	Residential Dwelling	253120	6175690
19	Residential Dwelling	253090	6176020
20	Residential Dwelling	253420	6176430
21	Residential Dwelling	254900	6176060
22	Residential Dwelling	254920	6176560
23	Residential Dwelling	254760	6176640
24	Residential Dwelling	254520	6176360
25	Residential Dwelling	253250	6176990
26	Residential Dwelling	253610	6177120
27	Residential Dwelling	253560	6177670
28	Residential Dwelling	253380	6177740
29	Residential Dwelling	253100	6177550
30	Residential Dwelling	252090	6176670
31	Residential Dwelling	251860	6176380
32	Residential Dwelling	252200	6178310
33	Residential Dwelling	253010	6179660
34	Residential Dwelling	253500	6179330
35	Residential Dwelling	254150	6180170
36	Residential Dwelling	254500	6180080
37	Residential Dwelling	254500	6179550
38	Residential Dwelling	254570	6179590
39	Residential Dwelling	254620	6179730
40	Residential Dwelling	254740	6179870
41	Residential Dwelling	254880	6179320
42	Residential Dwelling	254950	6179690
43	Residential Dwelling	254960	6179820
44	Residential Dwelling	254890	6180090
45	Residential Dwelling	255080	6180010
46	Residential Dwelling	255320	6179980
47	Residential Dwelling	255550	6179970
48	Residential Dwelling	256680	6179830
49	Residential Dwelling	256830	6179940
50	Residential Dwelling	256520	6180360
51	Residential Dwelling	257570	6180480
52	Residential Dwelling	257930	6180690

53	Non-Residential / Industrial Development (Austral Bricks Quarry)	257560	6179180
54	Residential Dwelling	258890	6178950
55	Residential Dwelling	255200	6178760
56	Residential Dwelling	255540	6178790
58	Residential Dwelling	257710	6177500
59	Residential Dwelling	257950	6177770
60	Residential Dwelling	257050	6177700
61	Residential Dwelling	257050	6176500
62	Residential Dwelling	257050	6176070
63	Residential Dwelling	257050	6175760
64	Residential Dwelling	257770	6175910
65	Residential Dwelling	258750	6175880
66	Residential Dwelling	258240	6175700
67	Residential Dwelling	258190	6175700
68	Residential Dwelling	258130	6175500
69	Residential Dwelling	258030	6175120
70	Residential Dwelling	258500	6175700
71	Residential Dwelling	253640	6175940
72	Non-Residential / Industrial Development	253910	6179570
73	Non-Residential / Industrial Development	253990	6179730
74	Non-Residential / Industrial Development	254240	6179030
75	Non-Residential / Industrial Development	254630	6179330
76	Non-Residential / Industrial Development	255840	6178630
77	Non-Residential / Industrial Development	256270	6178830
78	Non-Residential / Industrial Development	258490	6178710
79	Non-Residential / Industrial Development	256590	6177540
80	Non-Residential / Industrial Development	258210	6177120
81	Non-Residential / Industrial Development	258790	6176640
82	Non-Residential / Industrial Development	257770	6176670
83	Non-Residential / Industrial Development	257040	6175660
84	Non-Residential / Industrial Development	257330	6175460
85	Non-Residential / Industrial Development	257330	6175170
86	Non-Residential / Industrial Development	257600	6175170
87	Non-Residential / Industrial Development	258890	6178950
88	Non-Residential / Industrial Development (Boral Cement Plant)	255480	6178050
89	Residential Dwelling	256810	6180490
90	Residential Dwelling	259160	6179570
91	Residential Dwelling	259270	6180470

Airlabs (2020) note, that the following key pollutants have been identified:

- Hydrogen Fluoride (HF);
- Total Solid Particles (TSP);
- Nitrogen Oxides (NO_x);
- Sulfuric Acid Mist and Sulfur Trioxide (SO_3); and
- Sulfur Dixoide (SO_2).

With respect to the key pollutants identified, the impact assessment criteria referenced from the Approved Methods for the identified pollutants are outlined in **Table 17** below.

Table 17: Adopted Air Quality Impact Assessment Criteria for the Identified Pollutants

Pollutant	Assessment Criteria	Averaging Period	Assessment	Reporting Percentiles
TSP	90 µg/m^3	Annual	Cumulative	N/A
PM_{10}	50 µg/m^3	24-Hours	Cumulative	100th Percentile
	25 µg/m^3	Annual	Cumulative	N/A
$PM_{2.5}$	25 µg/m^3	24-Hours	Cumulative	100th Percentile
	8 µg/m^3	Annual	Cumulative	N/A
Hydrogen Fluoride (HF) – general land use assessment criteria	0.5 µg/m^3	90 days	Cumulative	100th Percentile
	0.84 µg/m^3	30 days	Cumulative	100th Percentile
	1.7 µg/m^3	7 days	Cumulative	100th Percentile
	2.9 µg/m^3	24-Hours	Cumulative	100th Percentile
Sulfur Dioxide (SO_2)	712 µg/m^3	10 Minutes	Cumulative	100th Percentile
	570 µg/m^3	1 Hour	Cumulative	100th Percentile
	228 µg/m^3	24-Hours	Cumulative	100th Percentile
	60 µg/m^3	Annual	Cumulative	N/A
Nitrogen Dioxide (NO_2)	246 µg/m^3	1 Hour	Cumulative	100th Percentile
	62 µg/m^3	Annual	Cumulative	N/A
Sulfuric Acid (representing sulfuric acid mist and sulfur trioxide emissions)	18 µg/m^3	1 Hour	Incremental	99.9th Percentile, at or beyond the proposed facility site boundary.
Deposited Dust Levels	2 g/m^2/ month – maximum increase in deposited dust level.	Annual	Incremental	N/A
	4 g/m^2/ month – maximum total deposited dust level.	Annual	Cumulative	N/A

In conjunction with the abovementioned data, the following sources have been accounted for by Airlabs, to estimate existing air quality levels surrounding the Subject Site:

- Ambient air quality levels from the nearest / representative ambient air quality monitoring stations.
- Impacts from the Austral Bricks Quarry.
- Impacts from the Austral Masonry Plant.
- Impacts from the Boral Cement Plant.

Furthermore, the Proposed Development would generate emissions from the following sources:

- Proposed facility kiln exhaust stack; and
- Fugitive dust emissions generated from various operational activities at the Subject Site.

6.5.1 Emissions from the Kiln Exhaust Stack

To align the design of the Proposed Development with best practice fluoride mitigation measures implemented by the Austral Bricks management across Australia, the discharge concentration of HF from the proposed kiln exhaust stack will be capped to a maximum of 20 mg/m^3, which is considerably lower than the fluorine Group 6 Standards for Ceramic Works as per Schedule 3 of the POEO Clean Air Regulations 2010.

It is noted, that expected maximum pollutant discharge concentrations are outlined in **Table 18** below. Accordingly, pollutant emission rates from the proposed kiln stack are outlined in **Table 18** below, whilst **Table 19** outlines the critical stack parameters.

Table 18: Pollutant Discharge Concentrations and Corresponding Emission Rates from the Proposed Facility Kiln Exhaust Stack					
Pollutant	**Design Concentration (as provided to Airlabs)**	**Units**	**Corresponding Standard of Concentration – Ceramic Works, Group 6, Schedule 3 POEO Clean Air Regulation 2010**	**Compliance with Clean Air Regulation Standard of Concentration**	**Estimated Mass Emission Rate (g/sec)[(d)]**
TSP	45	mg/Nm^3 corrected to 273K, dry and 101.325 kPA	50 mg/m^3	Yes	1.05
PM_{10}	37 [(a)]	mg/Nm^3 corrected to 273K, dry and 101.325 kPA	n.d.	n.d.	0.87
$PM_{2.5}$	22.5 [(b)]	mg/Nm^3 corrected to 273K, dry and 101.325 kPA	n.d.	n.d.	0.53
HF	20	mg/Nm^3 corrected to 273K, dry and 101.325 kPA	50 mg/m^3	Yes	0.47
SO_2	400	mg/Nm^3 corrected to 273K, dry and 101.325 kPA	1,00 mg/m^3 [(c)]	Yes	9.37
NO_x as NO_2	450	mg/Nm^3 corrected to 273K, dry and 101.325 kPA	500 mg/m^3	Yes	10.54
Sulfuric Acid Mist	75	mg/Nm^3 corrected to 273K, dry and 101.325 kPA	100 mg/m^3 [(c)]	Yes	1.76

Notes:

(a) Design concentrations for PM10 were not provided. As-such, PM10 concentrations have been estimated based on the PM10 / TSP ratio obtained from the design concentrations for the upgraded Plant 2 site at Horsley Park (SSD 9601)

(b) Design concentrations for PM2.5 were not provided. As-such, PM2.5 concentrations have been estimated assuming that they are approximately 50% of the design TSP concentration.

(c) Standards of concentration referenced from Schedule 4 – Standards of concentration for scheduled premises: general activities and plant

(d) Mass emission rate calculated based on provided design concentration and corresponding volumetric flow rate of 23.4 Nm3/sec

(e) n.d. – no data

Table 19: Proposed Facility Kiln Stack Parameters		
Parameter	**Value**	**Units**
Location – Easting (X)	256947	M
Location – Northing (Y)	6178300	M
Height Above Ground Level	35	M
Stack Diameter at Exit	2.0	M
Design Exit Velocity	13.74	m/sec
Stack Temperature at Exit	453	Kelvin
Operational Hours	Continuous (24 hours, 365 days)	

6.5.2 Fugitive Dust Emissions from the Operational Phase

It is noted, that fugitive dust emissions have been quantified for the following sources:

- Truck unloading raw materials into the drive-over bin;
- Conveying raw material to the crusher hopper;
- Crushing operations;
- Conveying crushed material into the raw material storage building;
- Unloading of the materials in the raw material storage building;
- Loading and conveying operations – surge bin; and
- Haulage on paved surfaces.

Airlabs note, that an air quality improvement feature at the Subject Site as a result of the Proposed Development is to avoid external material stockpiles. Raw materials would be unloaded and handled inside the raw material storage building (which attains a height of 20 m, with the maximum stockpile height at 10 m). This would considerably reduce / minimise the potential for wind erosion emissions from stockpiles. Similarly, the crusher infrastructure would be enclosed internally, which significantly minimises the potential for airborne dust emissions resulting from the crushing and associated operations.

Additionally, for the material handling activities (loader operations, conveyor operations etc.), emissions have been spread over a 12-hour period every day of the year. Another key feature with regards to minimising dust emissions is that the access / service roads within the Subject Site, used by haul trucks for delivering raw material and transporting product material would be paved and the potential for wheel generated dust would be limited as opposed to unpaved / unsealed road surfaces.

It is noted, that Particulate Matter (TSP, PM_{10}, $PM_{2.5}$) emission rates have been quantified based on emission factors corresponding to specific operational activities (refer to **Table 20** below).

Table 20: Estimated Annual Fugitive Dust Emission Rates from the Proposed Facility

Activity	Modelled Annual Emission Rates (kg/year)		
	TSP	PM_{10}	$PM_{2.5}$
Trucks unloading raw materials into the drive-over bin.	8.1	3.8	0.6
Conveying raw material to the crusher hopper.	8.1	3.8	0.6
Crusher operations.	114.0	51.3	905
Conveying crushed material into the raw material storage building.	8.1	3.8	0.6
Loading of crushed raw materials into temporary stockpiles in the raw materials storage building.	8.1	3.8	0.6
Loading crushed raw material into the surge bin conveyor.	8.1	3.8	0.6

Conveying raw materials to the surge bin.	8.1	3.7	0.6
Heavy vehicle haulage – raw material delivery – paved surface.	293.7	56.4	13.6
Heavy vehicle haulage – product dispatch – paved surface.	364.1	69.9	16.9
Total	**820**	**200**	**44**

6.5.3 Fugitive Dust Emissions from the Construction Phase

Airlabs (2020) note, that as dust emissions generated during the construction phase would be temporary and short-term in nature, a quantitative assessment was not undertaken. Accordingly, construction based activities, which have a potential to generate dust emissions include:

- Earthwork operations such as excavation and topsoil stripping.
- Handling of spoil and structural fill material.
- Wind erosion from temporary exposed areas and stockpiles.
- Wheel generated dust from haulage on work areas.

Given that construction activities are progressive and transient in nature, the potential for the aforementioned activities to adversely impact the local air quality is low. Furthermore, construction activities would take place sporadically over a large areas, which would significantly limit the potential for any adverse offsite impacts. Notwithstanding, the following mitigation measures are outlined in **Table 21** below to minimise dust emissions during construction activities.

Table 21: Construction Dust Mitigation Measures

Source of Dust	Mitigation Measure	Timing
General	Identify dust-generating activities and inform site personnel about location.	Throughout Construction
	Identify adverse weather conditions (dry and high wind blowing from dust source to sensitive receptors) and halt dust emitting activities if visible dust impacts are identified at sensitive receptors.	Throughout Construction
Handling of Spoil and Structural Fill Material	Minimise drop height for material handling equipment.	Throughout Construction
Wind Generated Dust from Temporary Stockpiles and Exposed Areas	Apply watering through water trucks or sprinklers.	As Required
	Progressive staging of dust generating activities throughout the day to avoid concurrent dust emissions.	Throughout Construction
	Minimise exposed area if possible.	Throughout Construction

	Minimise amount of temporary material stockpiled if possible.	Throughout Construction
Wheel Generated Dust During Hauling	Restrict vehicle movement to haul routes that are watered regularly.	Throughout Construction
	Cleaning of haul roads.	As Required
	Speed restrictions.	Throughout Construction

Additionally, combustions of diesel or petrol fuels (from vehicle movements and mobile machinery) could generate emissions of Particulate Matter, CO, SO_2, NO_x and Volatile Organic Compounds (VOCs). Based on the relatively small amount of fuel burning during the construction phase, emissions from vehicle exhaust and mobile machinery are not likely to cause adverse impacts on surrounding sensitive receptors and therefore have been excluded from the AQIA. Furthermore, there would not be any backup power systems / generators, and as such, pollutants (especially NO_x) released from the backup power generator systems are not considered a concern for the Proposed Development.

6.5.4 Dispersion Modelling – Incremental Impacts

Predicted incremental pollutant concentrations have been extracted at the worst impact sensitive receptor and are outlined in **Table 22** below.

Table 22: Summary of Predicted Incremental (Proposed Facility) Impacts – All Pollutants						
Pollutant	**Averaging Period**	**Assessment Criteria (µg/m³)**	**Reporting Requirements**	**Maximum Predicted Incremental Concentration (µg/m³) at the Worst Impact Receptor**	**Worst Impact Receptor Identification (I.D.)**	**% of Assessment Criteria – Maximum Predicted Incremental at the Worst Impacted Receptor**
TSP	Annual	90	100th percentile (maximum) at sensitive receptor	0.18	No. 80	0.2
PM_{10}	24-hour	50	100th percentile (maximum) at sensitive receptor	2.80	No. 80	5.6
	Annual	25	100th percentile (maximum) at sensitive receptor	0.15	No. 80	0.6
$PM_{2.5}$	24-hour	25	100th percentile (maximum) at sensitive receptor	1.69	No. 80	6.8
	Annual	8	100th percentile (maximum) at sensitive receptor	0.09	No. 80	1.1
HF	90-days	0.5	100th percentile (maximum) at sensitive receptor	0.13	No. 80	26
	30-days	0.84	100th percentile (maximum) at sensitive receptor	0.15	No. 80	18
	7-days	1.7	100th percentile (maximum) at sensitive receptor	0.37	No. 80	22
	24-hours	2.9	100th percentile (maximum) at sensitive receptor	1.50	No. 80	52

Table 22: Summary of Predicted Incremental (Proposed Facility) Impacts – All Pollutants						
Pollutant	**Averaging Period**	**Assessment Criteria (µg/m³)**	**Reporting Requirements**	**Maximum Predicted Incremental Concentration (µg/m³) at the Worst Impact Receptor**	**Worst Impact Receptor Identification (I.D.)**	**% of Assessment Criteria – Maximum Predicted Incremental at the Worst Impacted Receptor**
SO_2	10-minute	712	100th percentile (maximum) at sensitive receptor	131.3	No. 51	18
	1-hour	570	100th percentile (maximum) at sensitive receptor	69.8	No. 51	12
	24-hour	228	100th percentile (maximum) at sensitive receptor	30.0	No. 80	13
	Annual	60	100th percentile (maximum) at sensitive receptor	1.5	No. 80	2.5
NO_2	1-hour	246	100th percentile (maximum) at sensitive receptor	78.6	No. 51	32
	Annual	62	100th percentile (maximum) at sensitive receptor	1.7	No. 80	2.7
Sulfuric Acid	1-hour	18	99.9th percentile at or beyond site boundary	15.2	Maximum at or beyond site boundary.	84
Deposited Dust	Annual	2 g/m²/month (max increase in deposited dust levels).	100th percentile (maximum) at sensitive receptor	0.004	No. 78	0.2

From the data extrapolated from **Table 23**, Airlabs (2020) note, that it is unlikely there would be any adverse / significant contributions to overall air quality levels from the Proposed Development, from an operational standpoint.

6.5.5 Cumulative Impacts

The model predicted cumulative pollutant concentrations at the worst impacted sensitive receptor for all the assessed pollutants (with the exception of sulfuric acid) are outlined in Table 19 of the AQIA. The cumulative concentrations are a sum total of the following sources:

- Impacts from the proposed facility.
- Impacts from the Austral Bricks Quarry.
- Impacts from the Austral Masonry Plant.
- Impacts from the Boral Cement Plant.
- Ambient air quality levels recorded from the Bargo monitoring station.

From the cumulative concentrations outlined in Table 19 of the AQIA, Airlabs note the following observations:

- With the exception of the 24-hour average cumulative PM_{10} concentrations, all of the remaining pollutants are found to be well in compliance with their relevant assessment criteria at the worst impact receptor.
- To understand the exceedance reported for the 24-hour average PM_{10} concentrations, a refined assessment has been undertaken.
- For all the remaining pollutants, the cumulative concentrations at the worst impacted receptor are well under their respective assessment criteria.
- As noted in the assessment of incremental impacts, to determine ground level NO_2 concentrations, it was assumed that NO_x emissions released from all of the modelled sources are immediately converted to NO_2 (i.e. 100% NO_x to NO_2 conversion).

Taking into consideration the low level incremental impacts expected from the Proposed Development and compliance being achieved for the cumulative concentrations (with the exception of 24-hour average PM_{10} concentrations), it is unlikely that the Proposed Development would have any adverse impacts on the local air quality levels.

Airlabs conclude, that a suite of air quality improvement measures have been proposed (refer to **Table 23** above), which include – adopting best practice measures to minimise HF emissions from the kiln. A maximum HF discharge concentration of 20 mg/m^3 is being proposed, which is substantially lower than the corresponding POEO standards of concentration. Other notable improvements include – commissioning of a new kiln which will improve fuel consumption and emissions profile; maintaining a design stack height of approximately 35 m, which will aid pollutant dispersion. Additionally, significant reduction in fugitive dust emissions is being achieved through raw material stockpile and crusher enclosures and providing sealed haulage surfaces.

Overall, the findings of the dispersion modelling undertaken demonstrate that low-level impacts would be anticipated from the Proposed Development. The complete AQIA is located within **Appendix 13** of this EIS.

6.6 BIODIVERSITY

The *Biodiversity Development Assessment Report* (Cumberland Ecology, 2020) considered the potential biodiversity impacts of the Proposed Development (refer to **Appendix 14**).

Vegetation at the Site includes remnant canopy trees, planted vegetation and cleared areas. The Site has had a history of agricultural development which has resulted in the

degradation and clearing of the vast majority of the native vegetation. Remnant onsite canopies are dominated by *Eucalyptus macarthurii* (Camden Woollybutt). Planted areas within the Study Area include screening vegetation, windbreaks and garden vegetation. The Site occurs within the Hawkesbury–Nepean catchment and contains two surface drainage systems that flow in a southeast to northwest direction into Stony Creek, which eventually flow into the Wingecarribee River and the Wollondilly River. The topography is undulating with topographic high of 670 m Australian Height Datum (AHD) and a topographic low of 660 m AHD.

The Site occurs within the Sydney Basin Bioregion within the Moss Vale Subregion, and the Hawkesbury-Nepean River catchment. First order, Second order and Fifth order streams occur within the area assessed under the *Biodiversity Development Assessment Report*, including Stony Creek and Wingecarribee River. A small ephemeral tributary of Stony Creek creek is present within the Site, in the south, and a tributary of it in turn in the east. The broader Berrima Quarry site is predominantly located within the Moss Vale Highlands BioNet NSW Landscape, with a small area in the west within the Nattai Landscape.

The Site does not contain any:

- Important or local wetlands;
- Regional biodiversity corridor;
- Flyways for migratory species;
- Riparian buffers;
- Estuaries;
- Local wildlife corridors;
- Habitat connectivity;
- Karsts;
- Caves;
- Crevices;
- Cliffs;
- Areas of geological significance;
- Areas of Outstanding Biodiversity Value; or
- Soil hazard features.

Indeed, the Site is generally isolated from large tracts of woodland, being located within a mostly cleared agricultural landscape. There is potential that small degraded areas of vegetation could aid in dispersal of threatened species between surrounding isolated trees and more intact vegetation in surrounding Wingecarribee River to the north via Stony Creek.

The Site includes areas which will be maintained as Asset Protection Zones (APZs). All trees will be retained in these areas, however the ground layers dominated by exotic grasses would be mown). The Site also includes an area in the south where realignment of ephemeral creeks would occur to form a riparian corridor. These riparian areas where vegetation is to be removed would be included in the BAM calculator. The entire riparian area would be subject to a Vegetation Management Plan which will guide the revegetation and restoration of vegetation in the area.

Several vegetation mapping studies have been undertaken at the Site. Cumberland Ecology conducted additional vegetation surveys on 11 November 2019 to revise and update the previous vegetation mapping undertaken by Cumberland Ecology within the Site. Vegetation was ground-truthed to examine and verify the mapping of the condition and extent of the different plant communities. Mapping of plant communities was undertaken by random meander searches throughout each patch of vegetation. Records of plant community boundaries were made using a hand-held Global Positioning System (GPS) and mark-up of aerial photographs. The resultant information was synthesised using Geographical Information Systems (GIS) to create a spatial database that was used to interpret and interpolate the data to produce a vegetation map of the Site.

Vegetation integrity assessments were undertaken in the Subject Land in accordance with the BAM on 11 November 2019. This included the use of three 20 x 50m plots collecting the relevant BAM data. It is noted that within the broader New Berrima Quarry site, Cumberland Ecology has, to date, undertaken 12 BAM plots. As such, the minimum number of plots required by the BAM have been completed for each vegetation zone.

Eucalyptus macarthurii (Camden Woollybutt) was the only flora species subject to targeted threatened flora surveys for species credit species and which was then assessed as candidate species credit species for further assessment. Surveys were undertaken on 15 March 2018 and 11 November 2019, using random meanders and plot surveys.

The native vegetation cover value at the Site was assigned to the cover class of >10–30%. The native vegetation extent within the area assessed under the *Biodiversity Development Assessment Report* is shown in **Figure 24**. It occupies approximately 2.25 ha, which represents 10.9% of this aera. This native vegetation two native vegetation communities, with one naturally occurring, and one an artificial community consisting of planted eucalypts.

Figure 24 Mapped Native Vegetation Extent (Source: Cumberland Ecology,2020)

The remaining land within the area assessed under the *Biodiversity Development Assessment Report* (refer to **Appendix 14**) comprises cleared land, including exotic vegetation and buildings, totalling an area of approximately 18.38 ha. In accordance with Section 5.1.1.5 of the BAM, the areas of cleared land do not require further assessment, unless they are proposed for restoration as part of an offset, or provide habitat for species credit species.

The analysis determined that this native vegetation aligned with two Plant Community Types (PTCs) held within the BioNet Vegetation Classification database. **Table 23** provides a summary of the PCTs identified within the area subject to the *Biodiversity Development Assessment Report*.

Table 23 Plant Community Types						
PCT#	**PCT Name**	**Area (ha)**	**Vegetation Formation**	**Vegetation Class**	**% Cleared Value**	**TEC Status**
944	Mountain Grey Gum - Narrow-leaved Peppermint grassy woodland on shales of the Southern Highlands, southern Sydney Basin Bioregion	2.19	Wet Sclerophyll Forests (Grassy sub-formation)	Southern Tableland Wet Sclerophyll Forests	84%	Endangered Ecological Community (EEC) – Southern Highlands Shale Woodlands in the Sydney Basin Bioregion
731	Broad-leaved Peppermint - Red Stringybark grassy open forest on undulating hills, South Eastern Highlands Bioregion	0.06	Grassy Woodlands	Southern Tableland Grassy Woodland	80%	Not listed
Total		**2.25**				

Figure 25 shows the distribution of these PCTs.

Figure 25 Distribution of Plant Community Types (Source: Cumberland Ecology, 2020)

The PCT 944 Mountain Grey Gum was observed to have a canopy almost exclusively characterised by the endangered *Eucalyptus macarthurii* (Camden Woollybutt) with scattered occurrences of *Eucalyptus radiata* subsp. *radiata* (Narrow-leaved Peppermint). A shrub layer is lacking, and no regeneration of native canopy species of a shrub size or smaller is present. Past agricultural land uses have heavily degraded the ground layer with very few native species present. Several exotic plants were also observed to be present.
This PCT is observed to be consistent with the EEC Southern Highlands Shale Woodland as described in the final determination (NSW Scientific Committee 2001) for the community as listed under the BC Act. As a precautionary approach trees in a woodland formation and scattered remnant trees have been mapped as conforming to the BC Act listing of the EEC. Indeed, paragraph 6 of the final determination states:

> *Disturbed Southern Highlands Shale Woodlands remnants are considered to form part of the community including areas where the vegetation would respond to assisted natural regeneration, such as where the natural soil and associated seedbank is still at least partially intact.*

As a precautionary approach, the community has been considered to conform to the TEC within the BAM calculator, despite being degraded to the extent it is unlikely to respond to assisted natural regeneration. It is likely that restoration of this would require herbicide control over a long period of the entire ground layer due to the complete dominance of exotic species, and replanting of the shrub layer and ground layers in their entirety.

The PCT 731 *Broad-leaved Peppermint - Red Stringybark grassy open forest on undulating hills, South Eastern Highlands Bioregion* was identified as a small patch, a planted windrow, in the north of the area subject to the *Biodiversity Development Assessment Report*. It is characterised entirely by a canopy of planted *Eucalyptus cinerea* subsp. *cinerea* (Argyle Apple) and several planted *Eucalyptus scoparia* (Wallangarra White Gum). The ground layer is entirely exotic. It does not comprise a naturally occurring PCT, but has been included in the mapped extent of native vegetation as it contains plant species native to NSW.

The native vegetation identified in **Table 24** above was assigned to vegetation zones based on PCTs and broad condition state of the vegetation. Patch sizes were subsequently assigned for each vegetation zone, with zones being assessed using survey plots/transects to determine vegetation integrity. Plot/transect data utilised within the BAM Calculator (BAMC) to determine the vegetation integrity score is provided in Appendix A of **Appendix 14**.

Table 25 outlined below summarises these vegetation zones, patch sizes and vegetation integrity scores.

Table 24 Vegetation Zones									
Vegetation Zone	**PCT#**	**PCT Name**	**Condition Name**	**Area (ha)**	**Patch Size Class**	**Composition Condition Score**	**Structure Condition Score**	**Function Condition Score**	**Vegetation Integrity Score**
1	944	Mountain Grey Gum – Narrow-leaved Peppermint grassy woodland on shales of the Southern Highlands, southern Sydney Basin Bioregion	Low	2	>101 ha	0.7	23.4	9.7	5.5
2	731	Broad-leaved Peppermint - Red Stringybark grassy open forest on undulating hills, South Eastern Highlands Bioregion	Low	0.06	>101 ha	2.3	18.6	16.5	9
Total	**2.25**								

Table 26 sets out the predicted species credit species for the vegetation zones identified in **Table 25** above.

Table 25 Predicted Species Credit Species			
Scientific Name	**Common Name**	**Retained in Assessment?**	**Justification if Not Retained**
Flora			
Eucalyptus macarthurii	Paddys River Box, Camden Woollybutt	Yes	-
Persoonia mollis subsp. *revoluta*		No	The species is associated with Hawkesbury Sandstone soils. Soils within the Site are Wianamatta shales. Site is degraded by agriculture to the extent a native shrub layer is not present.
Pterostylis pulchella	Waterfall Greenhood	No	This species is known from only five locations, and the known habitat is limited to escarpments, in the proximity of waterfalls, or damp areas on ridges. The Site does not contain or occur on ridgetop habitat or escarpments.
Fauna			
Callocephalon fimbriatum	Gang-gang Cockatoo (Breeding)	Yes	-
Calyptorhynchus lathami	Glossy Black-Cockatoo (Breeding)	Yes	-
Cercartetus nanus	Eastern Pygmy-possum	No	No BioNet records within 10km of the Subject Land. Species has a preference for heathy habitats not present within the Subject Land.
Chalinolobus dwyeri	Large-eared Pied Bat	No	Habitat constraint absent from the Subject Land - i.e. No Cliffs and not within 2 km of rocky areas containing caves, overhands, escarpments, outcrops, or crevices, or within 2 km of old tunnels or mines.
Hieraaetus morphnoides	Little Eagle (Breeding)	No	Habitat constraint absent from the Subject Land - i.e. No nests within large trees, trees not within functional native vegetation community (no native ground layer or shrub layer - very low vegetation integrity score).
Lophoictinia isura	Square-tailed Kite	No	No nest trees located within Subject Land.
Miniopterus orianae oceanensis	Large Bent-winged Bat	No	Habitat constraint absent from the Subject Land – i.e. no caves, tunnels, mines, culverts or other structures known or suspected to be used for breeding present.
Myotis macropus	Southern Myotis	Yes	-
Ninox connivens	Barking Owl	No	Habitat constraint absent from the Subject Land – i.e. living or dead trees with hollow greater than 20 cm diameter.

Table 25 Predicted Species Credit Species			
Scientific Name	**Common Name**	**Retained in Assessment?**	**Justification if Not Retained**
Ninox strenua	Powerful Owl	No	Habitat constraints absent from the Development Site – i.e. no hollow bearing trees with hollows greater than 20 cm diameter and greater than 4 m above the ground. Species is predominately associated with forest habitat, and roosts in dense foliage, site contains only highly degraded open woodland.
Petaurus norfolcensis	Squirrel Glider	No	Species requires mature or old growth woodland or forest with abundant hollows for refuge and nest sites - these habitat features are not present within the Subject Land.
Phascolarctos cinereus	Koala	No	Habitat constraint absent - Development Site does not contain abundant feed trees. Few BioNet records within 10 km of Subject Land (7). Tree clumps within site generally separated by open space, which would leave koalas vulnerable to predators such as wild or domestic dogs.
Pseudophryne australis	Red-crowned Toadlet	No	Species is associated with ephemeral drainage lines below sandstone ridgetops. This habitat is not present within the Subject Land.
Pteropus poliocephalus	Grey-headed Flying Fox	No	No camp present within Subject Land or Study Area.

A total of three (3) flora species and 15 fauna species were predicted for the area subject to the *Biodiversity Development Assessment Report*. Of these, the following species were retained for further assessment, including targeted surveys:

- *Eucalyptus macarthurii* (Camden Woollybutt - associated with PCT 944 -refer to **Table 24** above);
- *Callocephalon fimbriatum* (Gang-gang Cockatoo- 18 hollow trees were identified within PCT 944, including hollows up to 15cm in diameter presenting suitable nesting habitat);
- *Calyptorhynchus lathami* (Glossy Black-Cockatoo- 18 hollow trees were identified within PCT 944, including hollows up to 15cm in diameter presenting suitable nesting habitat); and
- *Myotis macropus* (Southern Myotis- Stony Creek contains suitable foraging habitat, and some patches of PCT 944 with hollow trees suitable for roosting occur within 200m of foraging habitat).

Desktop assessments and field surveys within the area subject to the *Biodiversity Development Assessment Report* also included assessment of habitat constraints and microhabitats for predicted species credit fauna species. This included desktop assessment of proximity of the area subject to the *Biodiversity Development Assessment Report* to features such as caves and waterways and field inspection of microhabitats including leaf litter, stick nests and hollowing-bearing trees. **Table 27** provides a summary of the flora and fauna species credit species surveyed.

Table 26 Targeted Surveys for Threatened Flora and Fauna Species (Species Credit Species)				
Scientific Name	**Common Name**	**Recommended Survey Period**	**Dates of Survey within Subject Land**	**Survey Method**
Eucalyptus macarthurii	Camden Woollybutt	Jan-Dec	15 March 2018, 11 November 2019	Random meander, plot survey
Callocephalon fimbriatum	Gang-gang Cockatoo	Oct-Dec	13 February 2018 12 March 2018 15 March 2018 11 November 2019	Diurnal bird census (20 minutes – four locations within Study Area), incidental bird observation, Hollow Survey (all trees and stags in Study Area and Subject Land)
Calyptorhynchus lathami	Glossy Black-Cockatoo	Mar-Aug	13 February 2018 12 March 2018 15 March 2018 11 November 2019	Diurnal bird census (20 minutes – four locations within Study Area), incidental bird observation, Hollow Survey (all trees and stags in Study Area and Subject Land)
Myotis macropus	Southern Myotis	Oct-Jan	13 February 2018 (detectors deployed) 12 March 2018 15 March 2018 11 November 2019	Anabat© (two nights) and Songmeter© unit (four nights). Hollow Survey (all trees and stags in Study Area and Subject Land)

Table 28 sets out the direct impacts to native vegetation and habitat resulting from the Proposed Development.

In addition to removal of areas of PCTs, there would be a direct impact to the threatened tree species *Eucalyptus macarthurii* (Camden Woollybutt) with 24 individuals removed. Impacts to habitat of species credit species is confined predominately to removal of patches of woodland with suitably sized hollows in trees and stags for the Gang-gang Cockatoo and Glossy Black Cockatoo, and the removal of patches of woodland with suitably sized hollows within 200m of permanent water for the Southern Myotis.

Table 27 Direct Vegetation Impacts from the Proposed Development				
Vegetation Zone	**PCT #**	**PCT Name**	**BC Act Status**	**Area (ha)**
1	944	Mountain Grey Gum - Narrow-leaved Peppermint grassy woodland on shales of the Southern Highlands, southern Sydney Basin Bioregion	EEC	2
2	731	Broad-leaved Peppermint - Red Stringybark grassy open forest on undulating hills, South Eastern Highlands Bioregion	Not listed	0.06
Total				**2.06**

Table 29 details the change in vegetation integrity score for each vegetation zone. Within Vegetation Zone 1, comprising PCT 944, two management zones have been identified. One management zone comprises areas of PCT 944 which would be totally cleared, and the second management zone is areas of PCT 944 that would be managed within an APZ, involving the retention of vegetation with a managed ground layer. PCT 731 comprises a single management zone and occurs entirely in the area in which all vegetation would be removed. Overall, the Biodiversity Risk Weighting for both PCT 944 and PCT 731 is considered to be 2.

Table 28 Changes to Vegetation Integrity for each Vegetation Zone						
Vegetation Zone	**PCT #**	**PCT Name**	**Management Zone**	**Current VI Score**	**Future VI Score**	**Change in VI Score**
1	944	Mountain Grey Gum - Narrow-leaved Peppermint grassy woodland on shales of the Southern Highlands, southern Sydney Basin Bioregion	Complete Removal (CR)	5.5	0	-5.5
1	944	Mountain Grey Gum - Narrow-leaved Peppermint grassy woodland on shales of the Southern Highlands, southern Sydney Basin Bioregion	Asset Protection Zone (APZ)	5.5	2.1	-3.4
2	731	Broad-leaved Peppermint - Red Stringybark grassy open forest on undulating hills, South Eastern Highlands Bioregion	-	9	0	-9

Table 30 sets out the indirect impacts to native vegetation and habitat resulting from the Proposed Development.

Table 29 Indirect Vegetation Impacts from the Proposed Development					
Indirect Impact	**Nature**	**Extent**	**Duration**	**Threatened Entities Likely Affected**	**Consequences**
Inadvertent impacts on adjacent habitat or vegetation	Construction activities may result in inadvertent impacts on retained vegetation, such as increase sedimentation.	Retained vegetation within Study Area and VMP Area.	Short term (during construction)	Southern Highlands Shale Woodlands and *Eucalyptus macarthurii*	Reduced condition of the adjoining TEC and mortality of threatened species individuals.
Reduced viability of adjacent habitat due to edge effects	Modification of vegetation extent within the Subject Land may increase edge effects.	Retained vegetation within Study Area and VMP Area.	Potential long-term	Southern Highlands Shale Woodlands	Reduced condition of the adjoining TEC.
Reduced viability of adjacent habitat due to noise, dust or light spill	The construction activities associated with the project are likely to increase the noise, dust and light above current levels within the Subject Land.	Retained vegetation within Study Area and North Rocks Park.	Short term (during construction)	Ecosystem credit species	Short term disruption of fauna habitat usage during construction.

Table 29 Indirect Vegetation Impacts from the Proposed Development					
Indirect Impact	**Nature**	**Extent**	**Duration**	**Threatened Entities Likely Affected**	**Consequences**
Transport of weeds and pathogens from the Site to adjacent vegetation	A number of high threat exotic weeds are known to occur within the Subject Land and may be inadvertently spread to retained vegetation.	Retained vegetation within Study Area and VMP Area	Potential long-term	Southern Highlands Shale Woodlands	Reduced condition of the adjoining TEC.
Loss of breeding habitats	The project will result in the removal of 18 hollow-bearing trees.	PCT 944 (Areas shown as Complete Clearance)	Long-term	Hollow-dependent ecosystem credit species (e.g. microchiropteran bats) and species credit species (i.e. threatened birds and bats)	Reduction in available breeding habitat of hollow-dependent fauna and increased competition for hollows outside of the Subject Land

Prescribed impacts of development are identified in Clause 6.1 of the *Biodiversity Conservation Regulation 2017*. **Table 31** sets out the potential for Prescribed Impacts resulting from the Proposed Development.

Table 30 Prescribed Impacts of the Proposed Development	
Prescribed Impact	**Relevance to the Proposed Development**
Karst, caves, crevices, cliffs, rock outcrops and other geological features of significance	Not relevant. Features are not present within the Subject Land.
Human-made structures	Not relevant. Three buildings currently exist within the Subject Land that will all be removed by the project. None of the building are considered to comprise habitat for threatened species.
Non-native vegetation	Non-native vegetation occurs at scattered locations within the Subject Land, but it is not considered to comprise habitat for threatened species. Suitable habitat in the form of non-native and native vegetation will be retained within the Study Area. Some exotic species present could comprise foraging habitat for the Grey-headed Flying-fox, however the species forages on a wide variety of native and non-native species and the removal of small areas of vegetation is likely to have minimal impact on the species.
Habitat connectivity	Not relevant. The Subject Land has been largely cleared as a result of historic agricultural land uses and contains remnant native vegetation that largely exists as canopy trees above a highly modified and exotic dominated understorey. The vegetation within the Subject Land does not have connectivity to other areas of habitat, nor does it provide stepping-stone habitat to other areas as all areas to the east, south and west of the subject consist of scattered woodland within agricultural lands.
Waterbodies, water quality and hydrological processes	One first order and one second order stream is present within the Subject Land. These streams are ephemeral drainage lines that flow into Stony Creek to the northwest of the Subject Land. Both streams will be impacted by the Project; however, a stormwater basin and drainage corridor are proposed that are expected to maintain current surface water flows across the Subject Land and ultimately into Stony Creek. A VMP is to guide the restoration of the drainage corridor draining into Stony Creek with native vegetation.
Wind turbine strikes	Not relevant. Project does not comprise a wind farm development.
Vehicle strikes	Not relevant. Although the Project includes the construction of an access driveway to the brickworks factory, no impacts to threatened species are predicted, as terrestrial threatened fauna are not likely to currently utilise the Site, and threatened fauna is likely to be limited to birds and bats if present which are unlikely to be impacted by vehicle strikes.

The *Biodiversity Development Assessment Report* (refer to **Appendix 14**) explains how the design of the Proposed Development has been sited so as to allow for the necessary construction and operational requirements whilst also minimising impacts to areas

containing biodiversity values. In determining the location of the Proposed Development, the design has sought to minimise direct impacts on native vegetation and habitat by:

- Locating the development footprint primarily in areas comprising cleared land, exotic vegetation and planted vegetation;
- Locating the stormwater basin and drainage corridor primarily within exotic vegetation;
- Locating the development footprint in areas that will impact only on the peripherals of scattered patches of native vegetation, comprising PCT 944 and PCT 731 (or planted native trees assigned to this PCT);
- Largely avoiding areas of native vegetation located between the brick factory and the drainage corridor;
- Locating the development footprint outside of Stony Creek;
- Maintaining the drainage design of the existing overland flow characteristics and hydrology to Stony Creek;
- Retaining areas of native vegetation, comprising PCT 944;
- Situating the development footprint to remove the minimal number of trees of the threatened species *Eucalyptus macarthurii* (Camden Woollybutt) possible;
- Avoiding the use of bulk earthworks across the Study Area and limiting the width of batters so as to retain areas of native vegetation; and
- Maintaining stepping-stone habitat within the rural landscape through the retention of trees across the Study Area that primarily comprise the EEC Southern Highlands Shale Woodland consisting nearly entirely of the threatened *Eucalyptus macarthurii* (Camden Woollybutt).

In terms of Prescribed Impacts under Clause 6.1 of the *Biodiversity Conservation Regulation 2017* (refer to **Table 30** above) the design of the Proposed Development has sought to avoid and minimise direct impacts to waterbodies, water quality and hydrological processes by:

- Locating the development footprint outside of Stony Creek, the most significant tributary at the Site;
- Locating the development footprint in areas containing first and second order ephemeral drainage lines that only provide surface water to Stony Creek during periods of heavy rain; and
- Designing a drainage corridor in the south of the development footprint in order to maintain existing hydrological processes of the Site.

Overall, it is considered that the Proposed Development can proceed without resulting in significant biodiversity impacts. Moreover, due to the small scale of predicted indirect and prescribed impacts, the Proposed Development does not propose to use additional biodiversity credits to mitigate or offset these impacts.

Nevertheless, **Table 32** summarises the management measures which have been recommended within the *Biodiversity Development Assessment Report* (refer to **Appendix 14**) to mitigate the potential biodiversity impacts of the Proposed Development to an appropriate level of impact:

Table 31 Summary of Mitigation Measures for Impacts to Native Habitat						
Mitigation Measure	**Proposed Techniques**	**Timing**	**Frequency**	**Responsibility**	**Risk of Failure**	**Risk and Consequences of Residual Impacts**
Weed management	Appropriate weed control activities will be undertaken in accordance with the *South East Regional Strategic Weed Management Plan 2017 – 2022* (LLS: South East 2017).	Construction	Prior to construction, following vegetation clearing	Contractor	High	Spread of weeds throughout the Study Area and surrounding land.
Delineation of clearing limits	Clearing limits marked either by high visibility tape on trees of metal/wooden pickets, fencing or an equivalent boundary marker. Disturbance, including stockpiling, restricted to clearing limits.	Construction	Once	Contractor	High	Unnecessary damage to trees to be retained, including threatened species *Eucalyptus macarthurii* (Camden Woollybutt).
Tree protection measures	Inductions to communication tree protection measures. Installation of fences around specified tree protection zones. All tree work is to be carried out by a suitably qualified and insured Arborist.	Construction	Throughout construction period	Contractor	High	Unnecessary damage to trees to be retained.
Pre-clearance survey	Pre-clearance surveys will be conducted in all areas of vegetation that are required to be cleared. Pre-clearing surveys will be undertaken within one week prior to clearing (no earlier). Habitat features will be marked during the pre-clearing survey.	Construction	Once	Contractor	Moderate	Increased and unnecessary mortality of native fauna.

Table 31 Summary of Mitigation Measures for Impacts to Native Habitat						
Mitigation Measure	**Proposed Techniques**	**Timing**	**Frequency**	**Responsibility**	**Risk of Failure**	**Risk and Consequences of Residual Impacts**
Staging of clearing	Vegetation clearing will be conducted using a two-stage clearing process. Animals disturbed or dislodged during the clearance but not injured will be assisted to move to adjacent bushland or other specified locations. If animals are injured during the vegetation clearance, appropriate steps will be taken to humanely treat the animal (either taken to the nearest veterinary clinic for treatment, or if the animal is unlikely to survive, it will be humanely euthanized)	Construction	Once	Contractor	High	Increased and unnecessary mortality of native fauna.
Habitat feature salvage	Hollow to be removed within the Subject Land to be salvaged and attached to a retained tree. Should the structural integrity of the hollow not be maintained during the removal process, a single next box will be installed within retained vegetation.	Construction	Once	Contractor	Moderate	Reduction in available breeding habitat of hollow-dependent fauna and increased competition for hollows outside of the Subject Land.
Sedimentation control	Construction activities will be undertaken in accordance with "The Blue Book" (Landcom 2004). These include implementation of the following measures:	Construction	Throughout construction period	Contractor	High	Sedimentation into retained and adjoining vegetation.

Table 31 Summary of Mitigation Measures for Impacts to Native Habitat						
Mitigation Measure	**Proposed Techniques**	**Timing**	**Frequency**	**Responsibility**	**Risk of Failure**	**Risk and Consequences of Residual Impacts**
	▪ Installation of sediment control fences; ▪ Covering soil stockpiles; and ▪ Avoiding soil disturbance prior to heavy rainfall					

Additionally, the *Arboricultural Impact Assessment Report* prepared by Allied Tree Consultancy (2020) considers trees across the Site identified to be both retained and removed informing the overall species significance attributed to the Site (refer to **Appendix 16**).

Allied Tree Consultancy (2020) note, that the majority of the Site trees are mature *Eucalypts*, which appear to be predominantly remnant / random germinations, and a considerable number of the identified trees present a degree of decline. Approximately 227 trees are listed within the Report, which includes any tree where any part of the zones of protection, pertaining to the Tree Protection Zone (TPZ) and Structural Root Zone (SRZ), encroach into the Site.

The following summary outlines the impacts to relevant trees assessed across the Subject Site:

- Trees No. 22-31, 42, 43, 49-51, 63, 117-129, 144, 146-150 and 172-227:
    - These trees are not adversely impacted by the Proposal, for which they conform to a minor encroachment or less.
- Trees No. 5-19, 44, 45, 52-55, 65, 77, 130-143, 145, 152-166 and 168-171:
    - These trees will require removal as a result of the Proposal.
- Trees No. 1-8, 14-16, 19, 21, 27, 30, 33, 34, 36-43, 45, 46, 48, 50, 53-58, 60-64, 66, 67, 70-72, 74, 75, 80, 83, 88-94, 98-100, 104, 106, 107, 112, 113,127, 131, 136, 137, 146, 148-150, 152, 154-156, 159-161, 163, 164, 168,169, 176-181, 183, 187, 189-191, 193, 194, 196, 197, 199, 201, 204-208,210-212, 214, 215, 217-219, 221 and 227:
    - These trees indicate poor form and a limited useful life expectancy; however, the majority exhibit increased significance due to wildlife habitat, that includes nesting hollows.
- Trees No. 1-4, 20, 21, 32-41, 46-48, 56-62, 64, 66-76, 78-116, 151 and 167:
    - These trees are not directly located in the footprint of the Proposed Development; however, are subject to an encroachment.

The relevant recommendations outlined within Sections 7.3 and 7.4 of the Arborist Report will require adherence as part of the Proposal (refer to **Appendix 16**).

The assessment of impacts detailed in the BDAR prepared by Cumberland Ecology (2020) requires the following biodiversity credits to be retired, or remittance made to the Biodiversity Conservation Trust, or funding to be made to a Biodiversity Conservation Action as stipulated within Clause 6.5 of the BC Regulation. The credits required include:

- *Callocephalon fimbriatum* – one (1) credit.
- *Calyptorhynchus lathami* – one (1) credit.
- *Eucalyptus macarthurii* – 32 credits.

Cumberland Ecology confirm that further mitigation measures to manage biodiversity impacts within the Subject Site include:

- Weed management.
- Delineation of clearing limits.
- Tree protection measures.
- Pre-clearance surveys.
- Staging of clearing.
- Habitat feature salvage.
- Sedimentation control measures.
- Preparation of a VMP.

6.7 NOISE AND VIBRATION

The *Noise Impact Assessment* (Benbow Environmental, 2020) considered the potential noise and vibration impacts of the Proposed Development (refer to **Appendix 7**).

The principal sources of noise which would be generated by the Proposed Development include plant equipment, external mobile vehicles, truck movements associated with material delivery and loading and the external crushing operations. The predicted noise from excavation, civil, concreting and building works were also analysed, as were the noise road traffic impacts of the Site on nearby receivers.

The potential noise impacts of the construction and operation of the Proposed Development on nearby receptors was predicted using noise modelling software SoundPlan, and in accordance with the following guidelines:

- *NSW Noise Policy for Industry* (EPA, 2017);
- *NSW Road Noise Policy* (DECCW, 2011);
- *NSW Interim Construction Noise Guideline* (DECC, 2009); and
- *Moss Vale Enterprise Corridor Development Control Plan* (DCP) (Wingecarribee Council 2012.

The locations of potentially affected receives are shown in **Figure 26**. It is noted that receiver R4, the Mandurama property is owned by the proponent of the Proposed Development. While a residential dwelling is currently located on that site, approval has been obtained for a quarry on that site (refer to **Section 2.4**). Furthermore, a number of receptors (R10-R15) are understood to become commercial / industrial receptors in the future. However, for the purposes of the *Noise Impact Assessment*, these receptors were considered to be residential in nature.

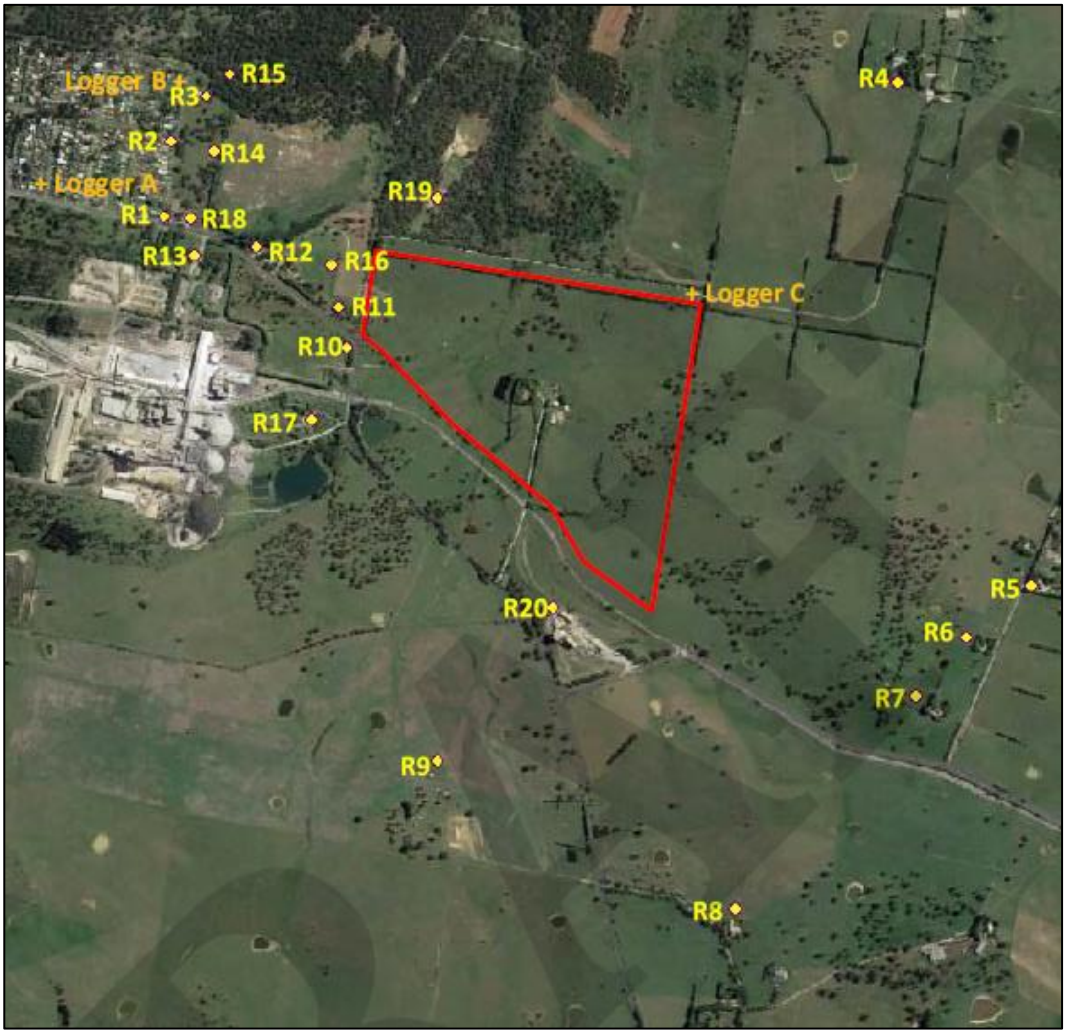

Figure 26 Location of Nearest Potentially Affected Receptors (Source: Benbow Environmental, 2018)

6.7.1 Existing Acoustic Environment

Benbow Environmental note, that the level of background noise varies over the course of any 24-hour period, typically from a minimum at 3:00am, to a maximum during both the morning and afternoon peak traffic peak hours. Accordingly, the *NSW EPA Noise Policy for Industry* (EPA, 2017) requires that the level of background and ambient noise be assessed separately for the daytime, evening and night time periods.

Background noise level measurements were carried out. This included unattended long-term noise monitoring between 14 March and 1 April 2018 at three locations (refer to **Figures 27-29** below), with attended monitoring at each of these locations on 14 March 2018 (refer to **Figure 30** below). This data was analysed to determine a single assessment background level for each day, evening and night time period, in accordance with the *NSW EPA Noise Policy for Industry* (EPA, 2017). Existing road traffic noise levels were obtained from an unattended environmental noise logger at one (Logger A) of the measurement locations (refer to **Figure 31** below).

Benbow Environmental (2020) note, that the background noise measurements were undertaken prior to any works being undertaken on the Site. Benbow consider these noise measurements representative of the existing acoustic environment at the nearest residential receivers that are not affected by the Site. Accordingly, the existing acoustic environment is characterised by traffic, birds, insects and noise outputs from the Boral Cement Works site.

Date	Average L_1			Average L_{10}			ABL (L_{90})			L_{eq}		
	Day	Evening	Night	Day	Evening	Night	Day	Evening	Night	Day	Evening	Night
14/03/2018	-	72	70	-	57	52	-	42	42	-	58	57
15/03/2018	-	71	69	-	59	54	-	48	42	-	60	59
16/03/2018	76	71	68	68	57	54	45	43	41	64	58	59
17/03/2018	73	68	65	63	54	49	44	41	40	61	55	55
18/03/2018	-	-	-	-	-	-	-	-	-	-	-	-
19/03/2018	-	70	67	-	56	54	-	41	42	-	57	59
20/03/2018	-	-	69	-	-	55	-	-	43	-	-	60
21/03/2018	-	73	-	-	60	-	-	47	-	-	60	-
22/03/2018	-	73	-	-	60	-	-	49	-	-	60	-
23/03/2018	76	71	68	68	58	55	47	44	43	64	58	59
24/03/2018	-	-	-	-	-	-	-	-	-	-	-	-
25/03/2018	-	70	63	-	54	49	-	44	42	-	56	52
26/03/2018	-	71	67	-	57	53	-	46	42	-	58	58
27/03/2018	77	72	69	69	58	55	43	44	43	65	59	60
28/03/2018	-	71	-	-	57	-	-	45	-	-	59	-
29/03/2018	75	71	69	68	58	54	44	41	42	64	59	59
30/03/2018	69	67	64	58	54	50	44	47	44	57	55	54
Average	**74**	**71**	**67**	**66**	**57**	**53**	*	*	*	*	*	*
Median (RBL)	*	*	*	*	*	*	**44**	**44**	**42**	*	*	*
Logarithmic Average	*	*	*	*	*	*	*	*	*	**63**	**58**	**58**

Note: - indicates values that has not been considered due to adverse weather conditions.
* Indicates values that are not relevant to that noise descriptor.
Value in bold indicates relevant noise descriptor.

Figure 27 Unattended Noise Monitoring Results at Logger Location A, dB(A) (Source: Benbow Environmental, 2018)

Date	Average L_1			Average L_{10}			ABL (L_{90})			L_{eq}		
	Day	Evening	Night	Day	Evening	Night	Day	Evening	Night	Day	Evening	Night
14/03/2018	-	55	46	-	51	43	-	35	37	-	52	42
15/03/2018	-	63	52	-	59	51	-	42	36	-	57	54
16/03/2018	56	55	55	46	50	52	34	37	41	49	51	54
17/03/2018	58	61	58	47	57	57	36	38	40	49	57	55
18/03/2018	-	-	-	-	-	-	-	-	-	-	-	-
19/03/2018	-	54	51	-	51	48	-	38	38	-	49	47
20/03/2018	-	-	50	-	-	46	-	-	39	-	-	46
21/03/2018	-	56	-	-	51	-	-	44	-	-	49	-
22/03/2018	-	55	-	-	50	-	-	40	-	-	48	-
23/03/2018	56	52	46	47	45	43	36	36	35	48	46	42
24/03/2018	-	-	-	-	-	-	-	-	-	-	-	-
25/03/2018	-	51	47	-	46	44	-	40	35	-	45	47
26/03/2018	-	54	49	-	47	43	-	40	37	-	57	43
27/03/2018	57	53	47	46	45	45	34	37	35	49	51	45
28/03/2018	-	57	-	-	54	-	-	41	-	-	53	-
29/03/2018	56	59	52	45	56	50	33	38	41	58	54	50
30/03/2018	56	51	54	46	48	52	35	42	40	50	47	51
31/03/2018	54	48	46	43	42	45	33	35	34	45	43	44
1/04/2018	55	55	43	45	47	41	33	36	34	48	47	40
Average	**56**	**55**	**50**	**46**	**50**	**47**	*	*	*	*	*	*
Median (RBL)	*	*	*	*	*	*	**34**	**38**	**37**	*	*	*
Logarithmic Average	*	*	*	*	*	*	*	*	*	**51**	**52**	**50**

Figure 28 Unattended Noise Monitoring Results at Logger Location B, dB(A) (Source: Benbow Environmental, 2018)

Date	Average L_1			Average L_{10}			ABL (L_{90})			L_{eq}		
	Day	Evening	Night	Day	Evening	Night	Day	Evening	Night	Day	Evening	Night
14/03/2018	-	50	44	-	44	40	-	36	36	-	44	39
15/03/2018	-	57	45	-	48	41	-	35	36	-	48	41
16/03/2018	59	50	49	50	42	42	36	34	34	53	42	42
17/03/2018	60	46	53	52	42	45	39	35	36	54	41	58
18/03/2018	-	-	-	-	-	-	-	-	-	-	-	-
19/03/2018	-	47	45	-	42	42	-	38	36	-	41	42
20/03/2018	-	-	47	-	-	44	-	-	38	-	-	43
21/03/2018	-	49	-	-	45	-	-	36	-	-	45	-
22/03/2018	-	41	-	-	38	-	-	34	-	-	37	-
23/03/2018	50	43	40	42	40	37	34	34	34	45	39	54
24/03/2018	-	-	-	-	-	-	-	-	-	-	-	-
25/03/2018	-	49	46	-	46	44	-	41	38	-	57	43
26/03/2018	-	53	49	-	50	46	-	42	41	-	48	60
27/03/2018	52	46	48	45	42	45	34	35	36	45	40	45
28/03/2018	-	71	-	-	57	-	-	45	-	-	59	-
Average	**55**	**50**	**47**	**47**	**45**	**42**	*	*	*	*	*	*
Median (RBL)	*	*	*	*	*	*	**35**	**36**	**36**	*	*	*
Logarithmic Average	*	*	*	*	*	*	*	*	*	**51**	**51**	**53**

Figure 29 Unattended Noise Monitoring Results at Logger Location C, dB(A) (Source: Benbow Environmental, 2018)

Location / Time	Noise Descriptor				Comments
	L_{Aeq}	L_{A90}	L_{A10}	L_{A1}	
Location A 90 Taylor Ave 14/03/2018 12:17	64	43	65	78	*Trucks passing < 82 dB(A)* *Cars passing < 75 dB(A)* *Industrial hum from Boral plant 42-45 dB(A)* *Wind in trees < 44 dB(A)* *Birds < 55 dB(A)* *Residential gate < 46 dB(A)* *Concrete truck passing < 79 dB(A)* *Noise Dominated by Traffic*
Location B 44 Adelaide Street 14/03/2018 12:46	40	36	45	41	*Wind < 43 dB(A)* *Insects < 37 dB(A)* *Distant traffic < 41 dB(A)* *Bird < 63 dB(A)* *Industrial hum barely audible* *Residential impulse noise < 57 dB(A)* *Truck passing on Taylor Ave < 41 dB(A)*
Location C 416 Berrima Road 14/03/2018 11:25	40	36	40	48	*Distant industrial hum < 37 dB(A)* *Wind gust < 42 dB(A)* *Insects < 40 dB(A) typically 36-40 dB(A)* *Birds 60 dB(A) – intermittent* *Train horn audible (distant)* *Train passing < 39 dB(A)* *Road traffic barely audible << 37 dB(A)* *Boral plant increase in noise levels 41-43 dB(A) duration approx. 1 min* *Reverse beeper audible* *Distant trucks passing <46 dB(A)*

Figure 30 Attended Noise Monitoring Results, dB(A) (Source: Benbow Environmental, 2018)

Date	Existing Road Traffic Noise – dB(A)			
	Daytime (7am to 10pm)		Night-time (10pm to 7am)	
	$L_{eq\ (15\ hour)}$	$L_{eq\ (1\ hour)}$	$L_{eq\ (9\ hour)}$	$L_{eq\ (1\ hour)}$
14/03/2018	-	-	57	57
15/03/2018	-	-	57	60
16/03/2018	64	65	57	59
17/03/2018	61	62	53	55
18/03/2018	-	-	-	-
19/03/2018	-	-	56	59
20/03/2018	-	-	56	58
21/03/2018	-	-	-	-
22/03/2018	-	-	-	-
23/03/2018	64	65	57	60
24/03/2018	-	-	-	-
25/03/2018	-	-	52	52
26/03/2018	-	-	55	58
27/03/2018	65	66	58	60
28/03/2018	64	64	-	-
29/03/2018	64	65	57	60
30/03/2018	58	58	53	54
Overall	63	64	56	58
Road Traffic Noise Levels at the 76 Taylor Ave	**62**	**63**	**55**	**57**

– Data excluded because adverse weather conditions were present.

Figure 31 Existing Road Traffic Noise Data – Logger A (Source: Benbow Environmental, 2018)

The rural category of residential noise amenity criteria was chosen from the *NSW Noise Policy for Industry* (EPA, 2017) to best represent the surrounding locality. The noise trigger levels for the Proposed Development were also established in accordance with the *NSW Noise Policy for Industry* (EPA, 2017). Under the *NSW Road Noise Policy* (DECCW, 2011), Taylor Avenue was classified as a sub-arterial road. The sound power levels for the identified noise sources associated with the operation of the Proposed Development was taken from equipment datasheets, on-site measurements of similar activities as well as from Benbow Environmental's database.

6.7.2 Operational Noise

Benbow note that the Project Noise Trigger Levels (PNTL) for the Site have been established in accordance with the principles and methodologies of the NSW Noise Policy for Industry (NPI) (EPA 2017). Accordingly, **Table 33** outlined below establishes the Rating Background Level (RBL), project intrusive noise level, recommended amenity noise level and project amenity noise level.

Table 32: Project Noise Trigger Levels (PNTL) for Operational Activities, dB(A)								
Receiver	**Type of Receptor**	**Time of Day**	**Rating Background Noise Level**	**Project Intrusiveness Noise Level $L_{eq,\ 15\ minute}$**	**Recommended Amenity Noise Level $L_{Aeq,\ period}$**	**Project Amenity Noise Level $L_{Aeq\ 15\ minute}$[4]**	**PNTL $L_{Aeq,\ 15\ minute}$**	**Sleep Disturbance L_{Amax}**
R1-R3	Residential - Rural	Day	34[1]	40	50	48	40	-
		Evening	38	40[2]	45	43	40	-
		Night	37	40[3]	40	38	38	52
R4-R9	Residential - Rural	Day	35	40	50	48	40	-
		Evening	36	40[2]	45	43	40	-
		Night	36	40[3]	40	38	38	52
R10-R15	Future Use – Commercial / Industrial	When In Use	-	-	65	63	63	-
R16	Active Recreation	When In Use	-	-	55	53	53	-
R17, R20	Industrial Premises	When In Use	-	-	70	68	68	-
R18-R19	Commercial Premises	When In Use	-	-	65	63	63	-

Notes:

1. A minimum rating background level of 35 dB(A) for daytime has been adopted as per the Noise Policy for Industry 2017.
2. The project intrusiveness level for evening time should be no greater than the project intrusiveness level for day time as per the Noise Policy for Industry 2017
3. The project intrusiveness level for night time should be no greater than the project intrusiveness level for evening time as per the Noise Policy for Industry 201 7
4. These levels have been converted to LAeq 15 minute using the following: $L_{Aeq\ 15\ minute} = L_{Aeq\ period} + 3$ dB (NSW Noise Policy for Industry Section 2.2).

It is noted, that one (1) scenario was modelled for operational noise emissions across the Subject Site. The scenario proposed, day, evening and night time operations, including proposed heavy vehicle movements, and plant operations of the approved masonry plant and the proposed brick manufacturing plant (refer to **Figure 27** below).

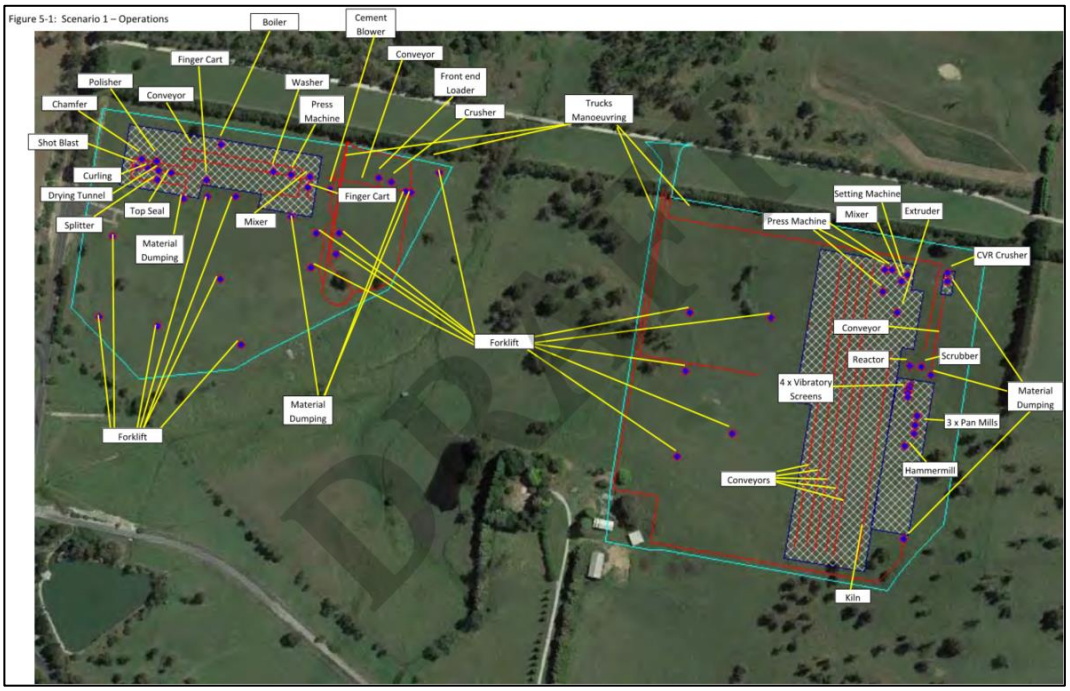

Figure 32 Scenario 1 – Operations (Source: Benbow Environmental, 2019)

Based on the above, predictive noise modelling was carried out using the ISO9613 algorithm within SoundPLAN v7.3. Noise levels at the nearest receptors have been calculated and results of the predictive noise modelling considering operational activities are shown in **Table 33**. This demonstrated that the operation of the Proposed Development would comply with the relevant noise criteria for all receptors.

Table 33 Predicted Noise Levels – Operational Activities dB(A)

Receptor	Proposed Development Criteria $L_{eq(15\ minute)}$			Proposed Development Criteria L_{Amax}	Scenario 1	
	Day	Evening	Night		Predicted $L_{eq(15\ minute)}$	Predicted L_{Amax}
R1	40	40	38	52	35	40
R2	40	40	38	52	37	44
R3	40	40	38	52	37	44
R4	40	40	38	52	38	45
R5	40	40	38	52	36	42
R6	40	40	38	52	37	43
R7	40	40	38	52	37	42
R8	40	40	38	52	36	41
R9	40	40	38	52	37	43
R10	63			N/A	47	N/A
R11	63			N/A	46	N/A
R12	63			N/A	37	N/A
R13	63			N/A	35	N/A
R14	63			N/A	38	N/A
R15	63			N/A	37	N/A
R16	53			N/A	39	N/A
R17	68			N/A	43	N/A
R18	63			N/A	35	N/A

R19	63	N/A	48	N/A
R20	68	N/A	41	N/A

Overall, the operation of the Proposed Development is predicted to comply with the Proposed Development specific criteria under neutral weather conditions at all sensitive receptors. Furthermore, sleep disturbance is not predicted at any residential receptors as a result of the Proposed Development.

6.7.3 Road Traffic Noise

The closest residential receptors along the proposed truck routes to and from site are along Taylor Avenue. Road traffic noise impacts have been analysed at the potentially most impacted road traffic receiver at 76 Taylor Avenue, New Berrima. As shown in **Table 35** below, residential dwellings fronting onto Taylor Avenue would experience noise levels associated with vehicle movements below the daytime criteria of $L_{Aeq(15\ hour)}$ 60 dB(A) and $L_{Aeq(9\ hour)}$ 55 dB(A) for sub-arterial roads. Furthermore, given the current volumes along Taylor Road, the Proposed Development would not increase the cumulative road traffic noise levels during the day or night periods by more than 2dB. As no exceedances of road noise criteria are predicted, no additional mitigation strategies are recommended to manage road noise impacts.

Table 34 Predicted Levels for Road Traffic Noise, dB(A)

Receptor	Noise Criteria		Existing Traffic		Site Contribution		Cumulative Road Traffic Noise	
	Day $L_{Aeq,\ 15\ hour}$	Night $L_{Aeq,\ 9\ hour}$	Day $L_{Aeq,\ 15\ hour}$	Night $L_{Aeq,\ 9\ hour}$	Day L $_{Aeq,\ 15\ hour}$	Night $L_{Aeq,\ 9\ hour}$	Day $L_{Aeq,\ 15\ hour}$	Night $L_{Aeq,\ 9\ hour}$
76 Taylor Avenue, New Berrima	60	55	62	55	53	52	63	57

6.7.4 Construction Noise

Construction activities to facilitate the Proposed Development would include the following:

- Excavation/cut and fill levelling of land;
- Concreting site works; and
- Construction of industrial building.

Construction works are proposed to be undertaken during standard construction hours as follows:

- Monday to Friday, 7am to 6pm;
- Saturday 8am to 1pm; and
- No work on Sundays or public holidays.

Noise propagation modelling for these construction activities was carried out using SoundPlan v7.3. The noise generating scenarios considered a situation in which all equipment was running for 100% of the time over the 15 minute assessment period. The results are outlined in **Table 36** below. This demonstrates that the construction activities would comply with the relevant noise criteria at all residential receptors during standard construction hours.

Table 35 Noise Modelling Results Associated with Construction Activities for L_{eq}, dB(A)				
Receptor	**PSNL ($L_{eq,\ 15\ minute}$ dB(A)**	**Scenario (Standard Hours) (L_{eq}, dB(A)**		
	Standard Hours	**1**	**2**	**3**
R1	45	27	26	32
R2	45	26	25	31
R3	45	26	26	31
R4	45	29	30	35
R5	45	27	27	33
R6	45	28	28	33
R7	45	28	28	33
R8	45	25	24	30
R9	45	27	27	33
R10	70	35	36	41
R11	70	36	36	41
R12	70	29	29	34
R13	70	27	27	33
R14	70	27	27	32
R15	70	26	26	31
R16	65	31	32	37
R17	75	34	35	40
R18	70	27	37	32
R19	70	35	38	42
R20	75	34	34	39

In the NSW TfNSW Construction Noise Strategy document and Assessing Vibration – a Technical Guideline, construction equipment that may cause vibration impacts includes hydraulic hammers, vibratory pile drivers, pile boring, jackhammers, wacker packers, concrete vibrators and pavement breakers, amongst other equipment. The construction work and operations proposed at the Site would not use these types of equipment. A detailed Vibration Impact Assessment is therefore not considered warranted for the Proposed Development.

Furthermore, it is noted, that the Noise Impact Assessment assessed the cumulative impacts from both the approved masonry plant and the proposed brick manufacturing plant in accordance with the Noise Policy for Industry 2017. The background noise measurements were undertaken prior to any works being undertaken on the site and were not affected by the site in accordance with the Noise Policy for Industry 2017.

While the operation of the Proposed Development is expected to comply with the relevant noise criteria for nearby sensitive receptors, the following management measures are recommended to mitigate any residual noise impacts:

- Prohibition of extended periods of on-site revving/idling;
- Minimisation of the use of truck exhaust brakes on-site;
- Enforcement of low on-site speed limits;
- Signs to encourage quiet operations during the night period; and
- On-site mobile equipment to be maintained in accordance with a preventative maintenance program to ensure optimum performance and early detection of wearing or noisy components; and
- Replacement of beeping reversing alarms on all vehicles which are regularly used on site (the forklift and front-end loader) with reversing lights or a white noise reversing alarm (squawker).

Benbow (2020) conclude, that the noise generating scenarios are predicted to comply with the project specific noise levels at all receivers during all time period and weather

conditions. Additionally, compliance with the Guidelines set out in the Interim Construction Noise Guideline and NSW Road Noise Policy was predicted at all considered receptors.

6.8 BUSHFIRE

The *Bushfire Risk Assessment* (Blackash Bushfire Consulting, 2020) considered potential bushfire impacts for the Proposed Development (refer to **Appendix 17**). As the Proposed Development is categorised as 'other' development by the RFS' *Planning for Bushfire Protection 2006* (PBP 2019), it was assessed against the aims and objectives of the PBP 2019.

The north of Lot 1 DP785111 contains a portion of bushfire prone land (refer to **Figure 33**). However, the surrounding land is not considered to be bushfire prone.

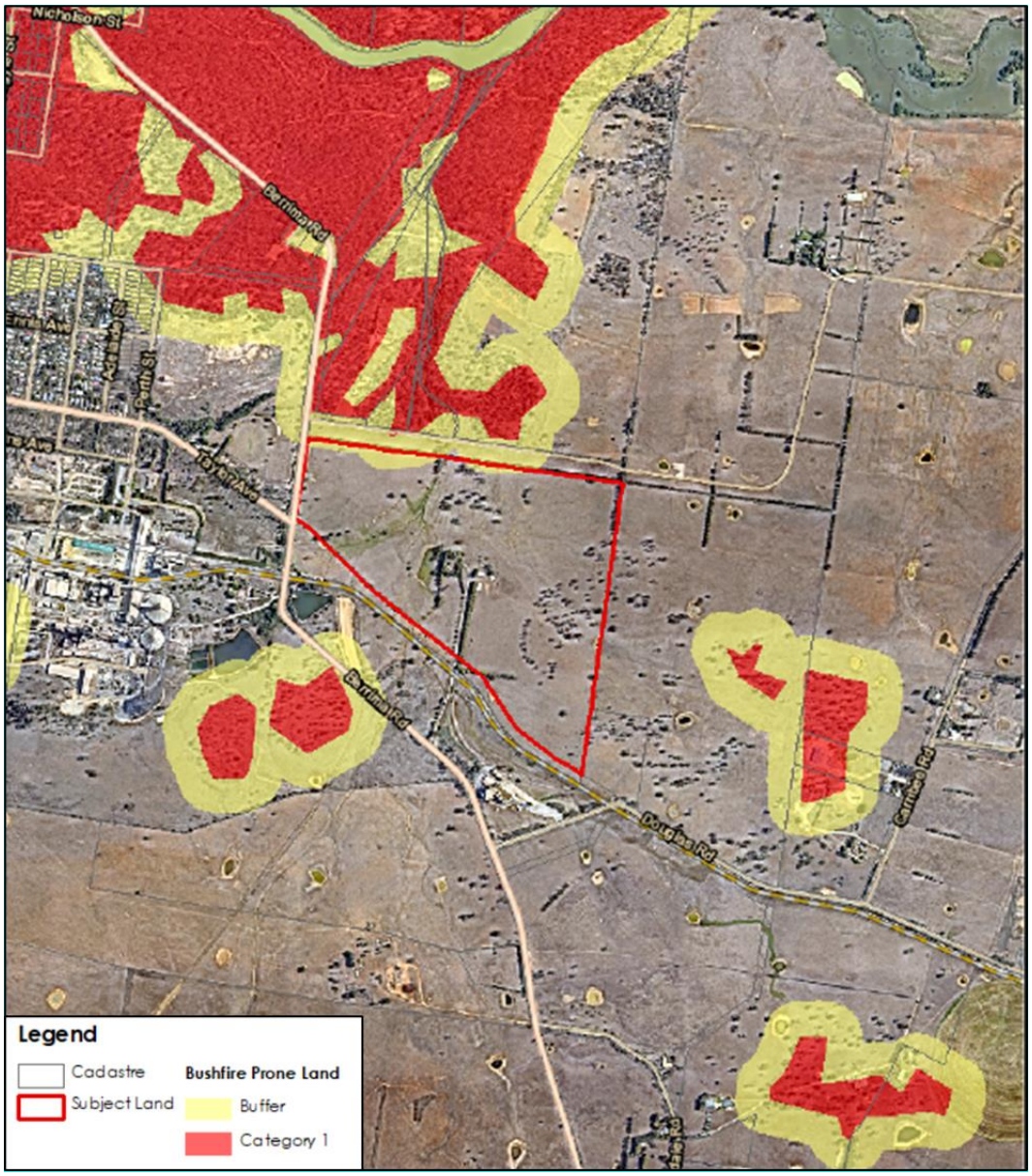

Figure 33 Bushfire Prone Land at Lot 1 DP785111 (Source: BlackAsh Bushfire Consulting, 2020)

Slope and surrounding vegetation will influence a site's bushfire risk. **Figure 34** sets out the vegetation types and land contours surrounding the Site.

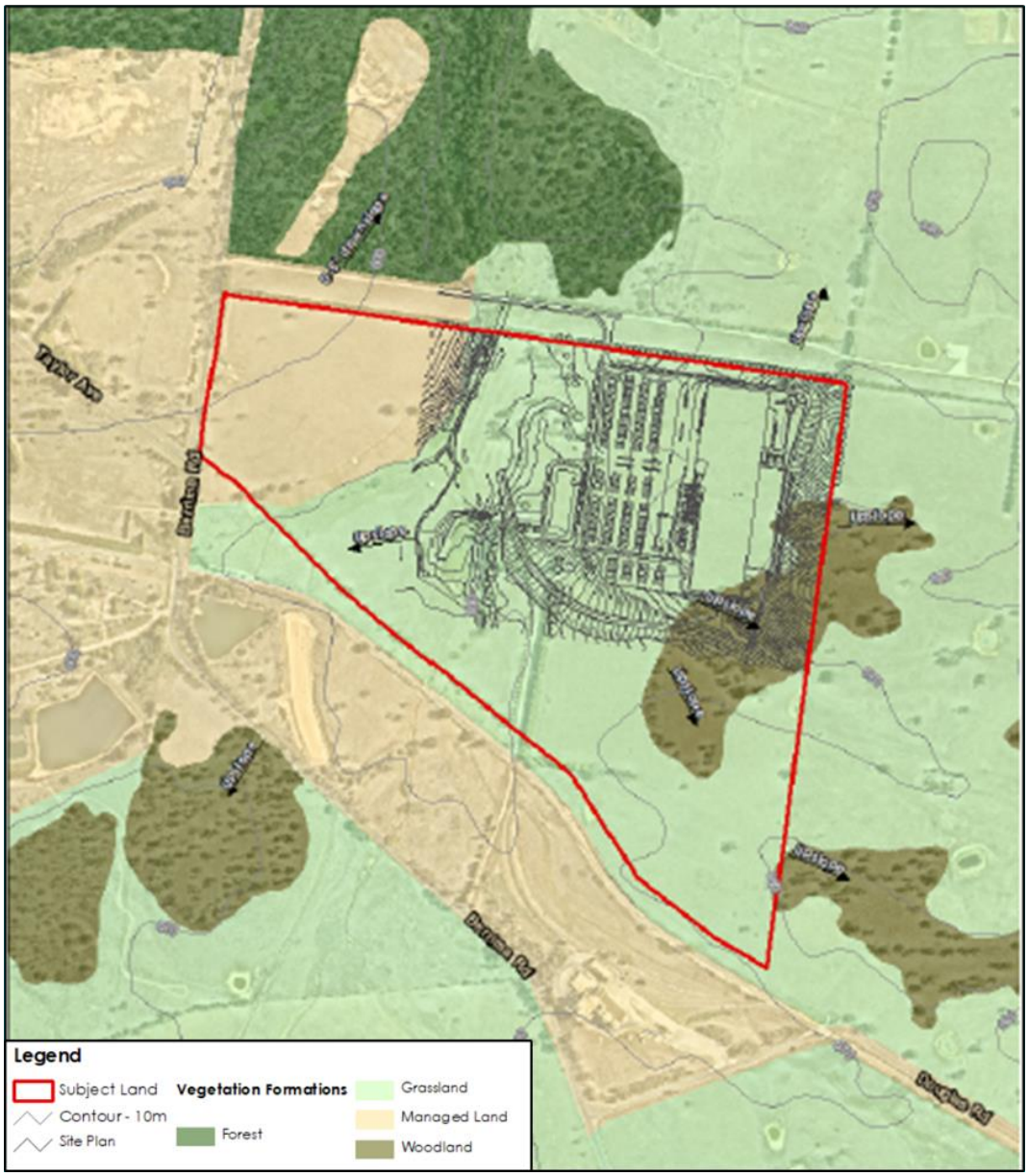

Figure 34 Vegetation and Slope at Lot 1 DP785111 (Source: BlackAsh Bushfire Consulting, 2020)

These vegetation communities are as follows:

- To the north - Forest vegetation separated by a large grassland;
- To the east – Grassland transitioning to woodland in the centre of the Site;
- To the south - Grassland and managed areas; and
- To the west - Grassland and managed areas.

Table 36 sets out the applicable Bushfire Attack Levels from woodland vegetation under PBP 2019.

Table 36 Bushfire Attack Levels (PBP 2019 Table A1.12.5)					
Vegetation Formation	**BAL-FZ**	**BAL-40**	**BAL-29**	**BAL-19**	**BAL-12.5**
All Upslope and Flatland					
Woodland (grassy and woody)	<9	9-<12	12-<18	18-<26	26-<100

0>5 Degrees – Downslope					
Woodland (grassy and woody)	<12	12-<16	16-<23	23-<32	32-<100

Figure 35 below shows the recommended Asset Protection Zones for Lot 1 DP785111 under PBP 2019, in order to maintain a defendable space which minimises material ignition at the Site.

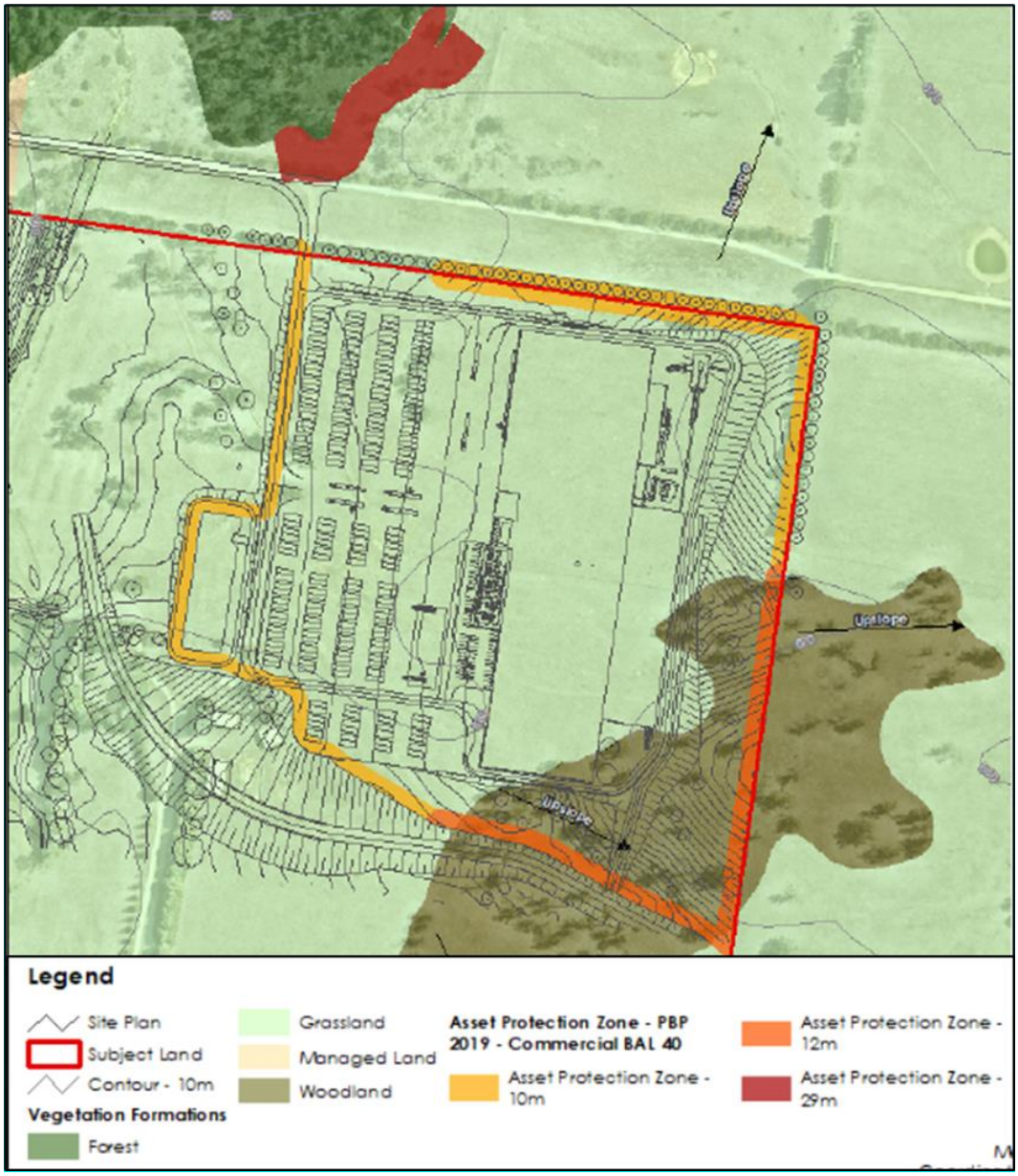

Figure 35 Asset Protection Zone Under PBP 2019 – Commercial BAL 40 (Source: BlackAsh Bushfire Consulting, 2020)

PBP 2019 requires that the design of access roads enables safe access and egress for people attempting to leave the area at the same time that emergency service personnel are arriving to undertake firefighting operations. **Figure 2** shows the Proposed Development including proposed access within the Site for articulated vehicles. All facilities would have perimeter roads around them including the designated "Fire Road" as shown on **Figure 4** in **Section 2.1** of this EIS. Due to the use of heavy machinery on site, the road widths will be more than sufficient (minimum 6m wide) to provide access for fire fighting vehicles.

PBP 2019 requires that adequate services of water is available for the protection of buildings during and after the passage of a bush fire, and that gas and electricity services are located so as not to contribute to the risk of fire to a building.

Suitable water supply arrangements would be provided for firefighting that meet the NSW RFS requirements. It is essential to ensure that any water sources are maintained at the appropriate capacity. Tanks would be located around the Site which are suitable for fire fighting access and connection. The capacity of these tanks would be determined by the fire engineer.

Fire hydrants would be provided in accordance with BCA E1.3, AS2419.1:2005, including the ring main requirements for large isolated buildings. Where internal hydrants are required, FRNSW progressive coverage (50m/25m) would be incorporated. Fire hose reels would also be provided in accordance with *AS2441:2005 Installation of Fire Hose Reels*.

Fire and smoke detection would be provided for the production building in accordance with *AS1670.1:2015 Fire Detection, Warning Control and Intercom Systems—System Design, Installation and Commissioning* for activation of the smoke exhaust system, and an industrial fit for purpose thermal detection system would also be provided throughout both buildings to interface with occupant warning systems.

All development in Bushfire Prone Areas needs to comply with the aim and objectives of PBP 2019. **Table 37** sets out the Proposed Development's compliance against these aims and objectives.

Table 37 Compliance with Aim & Objectives of PBP 2019

Aim/Objective	Criteria Met	Comment
The aim of PBP is to use the NSW development assessment system to provide for the protection of human life (including fire fighters) and to minimise impacts on property from the threat of bushfire, while having due regard to development potential, onsite amenity and the protection of the environment.	Yes	Landscaping, defendable space, access and egress, emergency risk management and construction standards are in accordance with the requirements of PBP and the aims of PBP have been achieved.
Afford occupants of any building adequate protection from exposure to a bushfire.	Yes	The Proposed Development provides opportunity for all occupants to be shielded from any external bushfire. Heavy plant and machinery would be present at the Site that can be used in fire-fighting operations within the Site (spot fires and grass fire) that provides onsite response to limit the development and spread of spot fires. Construction material would be non-combustible to ensure durability that would exceed the requirements of AS3959 Construction of buildings in bushfire-prone lands.
Provide for defendable space to be located around buildings.	Yes	Defendable space is provided on all sides of the Proposed Development.
Provide appropriate separation between a hazard and buildings, which, in combination with other measures,	Yes	The structures are separated from the narrow remnant areas of vegetation and provide APZs to

Table 37 Compliance with Aim & Objectives of PBP 2019		
Aim/Objective	**Criteria Met**	**Comment**
prevent direct flame contact and material ignition.		BAL 40. The structures are non-combustible.
Ensure that safe operational access and egress for emergency service personnel and occupants is available.	Yes	The Site has direct access to public roads, and access and egress for emergency vehicles and evacuation is adequate. A perimeter road is provided around the buildings. The Proposed Development provides for the movement of heavy articulated trucks about the Site with passing areas provided for fire trucks if needed.
Provide for ongoing management and maintenance of bushfire protection measures, including fuel loads, in the asset protection zone.	Yes	The Site would be managed as an APZ and would be extensively cleared to mineral earth.
Ensure that utility services are adequate to meet the needs of firefighters (and others assisting in bushfire fighting).	Yes	Utility services are adequate to meet the needs of firefighters (and others assisting in bushfire fighting).

Overall, it is considered that the Proposed Development does not pose a future hazard to adjoining lands or development. While the Site could be impacted by embers from adjoining lands and from spot fires within the Site, the *Bushfire Risk Assessment* (refer to **Appendix 17**) demonstrates how the Proposed Development satisfies the requirements of PBP 2019, in particular the provision of asset protection zones, access (including perimeter roads) and water supply for firefighting purposes.

The Proposed Development is designated development and considered as "other" development as per PBP 2019 and complies with the aim and objectives of that policy document (refer to **Table 37** above).

Nevertheless, the *Bushfire Risk Assessment* recommended the following management measures to mitigate potential bushfire impacts to an acceptable level of impact:

- At the commencement of building works and in perpetuity, an APZ would be established and maintained as per **Figure 35** above. The APZ would be established and maintained as an inner protection area as outlined within PBP 2019 and the NSW RFS document '*Standards for Asset Protection Zones*;'
- Fire hydrants would be provided in accordance with Building Code of Australia E1.3, *AS2419.1:2005 Fire Hydrant Installations*, including the ring main requirements for large isolated buildings; and
- A static water supply for firefighting purposes would be provided, including a connection for firefighting purposes that provides a 65mm Storz outlet with a ball valve fitted to the outlet.

6.9 SOILS AND WATER

The *Soil and Water Management Plan & Civil Servicing Report* (at&l, 2020) considers the potential impacts of the Proposed Development on the Site's geological conditions, as well as the surrounding water network and associated cycles (refer to **Appendix 8**).

6.9.1 Geology

The Site is located near the southern end of the Sydney Basin where one of the main geological units is the Wianamatta Group. Subsoil strata onsite are therefore expected to comprise:

- Topsoil (thickness may be up to 1m due to long-term rural use); over
- Variable thicknesses of clays and weathered shales; over
- Ashfield Shale; over
- Hawkesbury sandstone.

A geotechnical investigation has been commissioned on the Subject Site and once the Geotechnical Engineer's report is available its findings would be reviewed against the bulk earthworks design for the Proposed Development.

6.9.2 Proposed Development Earthworks

In order to create suitable levels for the various structures, pavements and associated components of the Proposed Development a significant quantity of bulk earthworks would be required. The earthworks design has been undertaken with the aim of balancing cut and fill, which has essentially been achieved in this case. This is advantageous as it means material does not need to be imported or exported from the Site (with traffic, cost and program implications). The required total cut to fill volume is estimated to be approximately 140,000 m^3 across the Site (refer to **Table 38** below).

Table 38 Proposed Development – Expected Cut and Fill Balance

	Net Cut (m^3)	Net Fill (m^3)	Balance (m^3)
Main Pad	-92,632	+140,250	+47,618
Drainage Channel	-48,575	+114	-48,460
Total	-141,206	+140,364	-842 (surplus)

The cut would be primarily generated from excavation at the northwest end of the Site for use in filling around the southern and eastern edges of the proposed pad area. It is noted, that some cut is also generated out of the proposed watercourse realignment along the southern edge of the Site and from the stormwater detention basin in the southwest corner of the Site.

All structural filling for the Proposed Development would be controlled filling undertaken with Level 1 supervision and certification by a geotechnical engineer to ensure proper compaction standards are achieved. Onsite topsoils would be stripped at the commencement of bulk earthworks and depending on the quantity, some would be blended with clay subsoils for use as general fill (subject to geotechnical advice) whilst some would be stockpiled for later respreading on landscaping areas. It should be noted that earthworks quantities quoted currently make no allowance for topsoil, pending confirmation of topsoil depth on the Site by geotechnical investigation.

The maximum permanent batter slope is assumed to be 1V:2H, subject to stabilisation measures. This would be confirmed by further geotechnical investigation and assessment.

6.9.3 Surface Water

Stony Creek runs through Lot 1 DP 785111, falling south to north with a sparsely vegetated riparian corridor. It is classified as a Category 2 aquatic and terrestrial habitat under the WLEP2010. It is also considered to be a third order watercourse in accordance with the stream order classification methodology described in the NSW Office of Water's *Guidelines for Riparian Corridors on Waterfront Land* (the Strahler System). Both of these classifications require a minimum 30 m riparian corridor setback from the top of the stream bank i.e. total corridor width of 60 m plus creek width.

All earthworks to facilitate the Proposed Development would take place outside of the defined 40 m riparian setback zone from the top bank of Stony Creek. Robust erosion and sediment controls would be installed upstream of the riparian zone to ensure that there are no adverse effects on the water quality, flora and fauna of the Stony Creek environment.

6.9.4 Groundwater

It is noted, that groundwater investigation / monitoring has not been undertaken for the Site since the Proposal does not involve any interaction between the Proposed Development and the underlying water table.

6.9.5 Erosion and Sediment Controls

A preliminary Erosion and Sediment Control Plan for the Site is included in Appendix A of **Appendix 8**. It is important to note that the measures identified on this plan are a conceptual approach to construction phase stormwater quality management. Further details of the erosion and sediment control systems and procedures would be provided at the detailed design stage when more information is available regarding in-situ soils and development staging.

Pre-construction erosion and sediment control measures would include:

- The civil contractor would prepare a traffic management plan for the Site which ensures efficient vehicle movement whilst minimising potential for sediment generation. This is to include designation and marking of transport routes across undisturbed portions of the Site to ensure minimal vegetation disturbance;
- Transport routes would be provided with stabilised construction entry/exits (i.e. Blue Book detail SD6-14) at the designated access points, including traffic rumble grids and washdown areas, to prevent vehicles carrying soils beyond the Site;
- Installation of a temporary sediment basin would occur before bulk earthworks across the Site begin so that sediment-laden runoff from the works can be captured and treated. This would logically be located in the same position as the future stormwater detention basin. All temporary sediment basins (including overflow weirs) would be located clear of the 100yr ARI flood event from the Stony Creek riparian corridor;
- Diversion of "clean" water from upstream catchments away from proposed areas of disturbance and discharge via suitable scour protection; and
- All site personnel are to complete an environmental induction covering the operation and maintenance of the erosion and sediment controls.

Construction phase erosion and sediment control measures would include:

- Sediment fences (i.e. Blue Book detail SD6-8) to be erected to filter and retain sediments at source. In particular around the base of all soil stockpiles and at the base of the perimeter batter to prevent sediment-laden stormwater from flowing into the Stony Creek riparian zone;
- Regular dust suppression on exposed areas by water truck or use of chemical dust suppressant;
- Rapid stabilisation of disturbed and exposed ground surfaces with hydro seeding in areas where imminent construction and building works are not proposed;
- Diversion of sediment-laden water into temporary sediment control basins for settling and flocculation (if required), including provision of catch drains which may need to be moved/altered numerous times to suit construction sequencing;
- Regular inspections as soon as practicable after storm events to check and maintain controls;
- Sediment to be removed from fences when controls are 40% full and at the completion of construction. All material to be re-used or stored on-site in a

controlled manner or taken off-site for re-use or disposal at a licensed waste disposal facility;
- Filter rolls or geotextile inlet filters (e.g. Blue Book SD6-11&6-12) to be installed around all new stormwater inlet gullies;
- Monitoring of water quality to determine the effectiveness of the sediment and erosion control management practices; and
- The sediment basin would not be converted into its ultimate detention basin form until such time as all building and construction works have been completed and 90% of the Site is stabilised.

6.9.6 Geomorphology

In the *Geomorphology Report* prepared by HPG Pty Ltd (2020), the geomorphology of Stony Creek and the resulting upstream and downstream impacts of the Proposed Development's provisions to include a proposed runoff diversion channel, which has been designed to mitigate and prevent erosion in the future (refer to **Appendix 10**).

HPG note, that all landforms have a dense cover of grasses, including Stony Creek. There is no sign of any significant recent erosion or deposition. All hill slopes and soils are stable. Apart from Stony Creek, runoff is by way of shallow overland flow. One short section of Stony Creek has stock trampling damage to the banks.

Furthermore, HPG note the following observations, confirming that the streams in the area have been stabilised by human intervention:

- The former 1st and 2nd Order Streams flowing out from the hills to the east of the Site have been filled to form broad swales.
- Remnants of spoil heaps beside the channel indicate that Stony Creek has been straightened and the banks have been battered.
- Stony Creek has been diverted into a large farm dam with flow exiting the dam by way of breach in its southwest corner. The dam backwater reduces flood velocities upstream.
- A small earth-and-culvert weir has been built on Stony Creek near the northern property boundary, although it is partially breached, the weir is still backing up a small pond and reducing flood flow velocities upstream.

Additionally, HPG note, that there is a short constructed drainage channel in the northwest corner of the Site, which appears to be intercepting the overland flow and diverting it into a very small pond, which traverses into Stony Creek along the northern boundary of the Site. The observed artificial channels were noted to be stable with a good cover of grass species, which would not be impacted by the proposed construction phase, except for a reduction in flow when the fill for the proposed building pad is constructed, cutting off the overland flow; thereby, making the channels a lot more stable.

Following review of the Civil Engineering Drawings prepared by at&l (2020), HPG note, that the proposed runoff diversion channel has been well designed to prevent erosion of the bed and banks, which would further prevent meanders developing within it.

Notwithstanding, it is important to note, that if the flow exiting the proposed diversion channel travels down just one of the flood chutes, the flow may be concentrated enough to cause significant erosion. Accordingly, HPG outline the following recommendations to implement to reduce any potential impacts with regard to flow exiting the proposed diversion channel:

- A flow spreading structure at least 20 m wide should be constructed at the downstream end of the proposed diversion channel. This should be designed to reduce the exiting flow concentration, making the flow wide and shallow so that it

flows overland down the slope of the flood plain and down at least two (2) of the existing flood chutes.

- The east bank flood plain overland flow area downstream from the diversion channel exit should be planted with closely-spaced, low-growing native plants such as Lomandra longifolia (spiny-head mat-rush).
- The diversion channel and the area downstream from its end should be monitored by inspection for erosion and sedimentation after each high flow event.

HPG conclude, that from a geomorphology point of view, there is only one potential problem with the Proposal for the Site – the flow exiting the proposed diversion channel; however, this can be mitigated appropriately by implementing the abovementioned mitigation measures and recommendations.

6.9.7 Stormwater

There are no existing formalised drainage features at the Site. As it is a rural site, stormwater runoff flows overland via sheet flow to the Stony Creek riparian corridor. Accordingly, runoff flows via overland flow from the elevated eastern portions of the Site into and through two (2) wide gullies running west and northwest through the centre of the Site, joining into one (1) and discharging into Stony Creek.

The Proposed Development has been divided up into two (2) key constituent catchments as outlined in **Table 39** below.

Table 39 Proposed Catchment Composition Summary

Catchment	Surface	Total Area	% Impervious	Discharge
1	Roof	3.38 ha	100%	Directed to OSD for attenuation of peak flows
	Pavements	6.05 ha	100%	
	Landscaping	0.61 ha	0%	
	Stormwater Basin	0.55 ha	0%	
	Subtotal	10.59 ha	89%	
2	Riparian Corridor	3.42 ha	0%	Sheet flow off batters into channel, diverted around the Site to Stony Creek.
	Eastern Batter	0.50 ha	0%	
	Subtotal	3.92 ha	0%	
Total		**14.51 ha**	**65%**	

A minor and major stormwater drainage system has been designed for this catchment to ensure that all runoff is captured, treated and attenuated in accordance with relevant Council and State standards.

At&l note, that the batter slopes in both these areas will be fully planted with suitable vegetation. Due to the relatively steep slope of the batter, it will be planted with low-maintenance shrubs, ground covers and trees to assist with bank stability and reduce erosion. Furthermore, no downstream treatment or attenuation is required for this catchment, as it will match the pre-development runoff regime, i.e. being fully pervious.

Wingecarribee Shire Council's standards specify that the minor system design for site drainage in commercial and industrial areas would be the 1 in 10 year ARI (10% AEP) event. Runoff from the external hardstands and carparks would be intercepted and collected by a combination of kerb inlet gully pits and field inlet gully pits located strategically around the Site. These pits would discharge flows into the underground piped network, which would fall south to the proposed treatment devices and outlet into the stormwater detention basin.

Discharge from the proposed Onsite Stormwater Detention (OSD) system would be controlled via a rock lined swale that would intersect the existing creek system. The discharge swale would be designed to meet the NSW Office of Water (NOW) Guidelines for outlet structures on waterfront land.

Accordingly, the following indicative design flows (refer to **Table 40** below) have been calculated as an indication of the scale of the stormwater generated by the Proposed Development footprint, as outlined in **Table 39** above.

Table 40: Indicative Post-Development Peak Stormwater Flows for Various ARI Events (Unmitigated)

	63% AEP / 2 year ARI (m^3/s)	10% AEP / 10 year ARI (m^3/s)	5% AEP / 20 year ARI (m^3/s)	1% AEP / 100 year ARI (m^3/s)
Catchment 1	2.43	4.27	5.11	6.41
Catchment 2	0.24	0.68	0.87	1.34
Subtotal	2.67	4.95	5.98	7.75

6.9.8 Water Quality Treatment

As the Site is located within the Sydney Drinking water catchment (refer to **Figure 5** in **Section 2.3** and **Table 6** in **Section 4.3**), any development must comply with Drinking Catchment SEPP.

It is anticipated that the following pollutants, common to urban stormwater runoff, are likely to be generated by the Proposed Development (refer to **Table 41** below).

Table 41 Potential Pollutant Types

Pollutant	Potential Causes	Treatment Types
Gross pollutants	▪ Pedestrians and vehicles; ▪ Waste collection systems; ▪ Leaf-fall from trees; and ▪ Spills and accidents.	Primary
Sediment	▪ Land surface erosion; ▪ Pavement and vehicle wear; ▪ Truck washing; ▪ Organic matter; ▪ Spillages, illegal discharges; ▪ Weathering of buildings; ▪ Atmospheric deposition; and ▪ Building/construction.	Primary
Hydrocarbons	▪ Leakage from vehicles; ▪ Truck washing; ▪ Organic matter; ▪ Spillage, illegal discharges; and ▪ Asphalt pavements.	Secondary
Nutrients	▪ Atmospheric deposition; ▪ Spillages, illegal discharges; ▪ Detergents (truck washing); and ▪ Organic matter.	Tertiary
Heavy Metals	▪ Atmospheric deposition; ▪ Vehicle wear; ▪ Weathering of buildings; and ▪ Spillages, illegal discharges.	Tertiary
pH	▪ Erosion of stored concrete clay products; ▪ Erosion of roofing material;	Tertiary

	▪ Organic matter; ▪ Atmospheric deposition; and ▪ Spillages, illegal discharges.	

There are no existing water quality treatment measures on the Site. In order to achieve the required pollutant load reductions, a treatment train approach would be implemented as part of the Proposed Development.

It is proposed to provide a proprietary primary/secondary treatment device, to be installed on the pipe network draining the impervious areas of the Site into the detention basin. This unit will focus on the capture of Gross Pollutants; however, will also provide some capture of sediment, hydrocarbons, oil, fuel, grease, Total Suspended Solids (TSS) and nutrients.

It is proposed that the southern portion of the proposed stormwater basin (located at the southwest corner of the Site) will act as a sediment basin. This area will capture coarse sediment particles which will settle to the basin floor. An internal concrete weir of 1.0 m height constructed across the centre of the basin will divide the sediment basin component from the on-site detention component. Low flows from the development's pipe network will be directed from the GPT unit into the sediment basin area, whilst high flows will bypass directly into the detention basin area (avoiding scour and re-suspension of sediment particles).

It is proposed to provide tertiary treatment with a proprietary filter media cartridge system installed in an underground vault to remove and dissolve nutrients such as nitrogen, phosphorous and suspended solids. This unit would be installed on the proposed piped network prior to discharge into the stormwater detention basin (most likely in an off-line configuration).

The Model for Urban Stormwater Improvement Conceptualisation (MUSIC, Version 6.3.0) was used to evaluate pollutant loads from the Site for both pre-development and post development conditions. MUSIC modelling results presented as mean annual loads at the receiving node indicate that adopted target reductions would be achieved at the Site with the Proposed Development in place (refer to **Table 42** below).

Table 42 Pollutant Loat Reduction Results

Pollutant	Sources (kg/yr)	Residual Load (kg/yr)	Reduction (%)	Target Reduction (%)
Total Suspended Solids	17,300	1,720	90.0	80
Total Phosphorus	33.2	8.75	73.7	45
Total Nitrogen	196	105	46.4	60
Gross Pollutants	1,870	0	100.0	90

According to WaterNSW's NorbE criteria the mean annual pollutant loads for the post-development case (including mitigation measures) must be 10% less than the pre-development case for total suspended solids, total phosphorus and total nitrogen. For gross pollutants, the post-development load only needs to be equal to or less than pre-development load. The *Soil, Water and Servicing Report* (refer to **Appendix 8**) confirms that this is achievable for the Proposed Development. An additional WaterNSW NorBe criteria is that pollutant concentrations for total phosphorous and total nitrogen for the post-development case (including mitigation measures) must be equal to or better compared to the pre-development case for between the 50th and 98th percentiles over the

five-year modelling period when runoff occurs. The *Soil, Water and Servicing Report* also confirmed that this is achievable.

It is furthermore noted that the MUSIC modelling outlined in the *Soil, Water and Servicing Report* are also considered to be conservative given that rainwater tanks are proposed for collection of roofwater. The tanks would provide additional water quality treatment for the roof catchment, over and above that provided by the stormwater treatment train described in. This occurs via settling of pollutants to the bottom of the tank and also via re-use of collected roofwater on landscaping areas.

The Proposed Development would operate a process in which there is little risk of contaminants being released into the stormwater system. However, should a spill occur the proposed stormwater basin would detain the contaminated material at the low-point of the Site until it can be removed via suction pumps or other equipment. It would be necessary to temporarily cap off the basin outlet pipes in this scenario.

6.9.9 Flooding

Flood modelling indicates that there would be no significant flood level impacts (afflux) on the upstream and downstream properties along the Stony Creek alignment as a result of the Proposed Development. In the 1 in 100 year ARI storm event (1% AEP) the afflux at the points on the boundary of the Site would be less than 10 mm and in the 1 in 500-year ARI it would be less than 15 mm.

The proposed building pad (FFL 665.0) and all other areas of the Proposed Development would have well in excess of 2.0 m freeboard to the adjacent 1 in 100 year ARI flood levels in Stony Creek (approx. RL659.7), as well as during the PMF level (approx. 662.4).

6.9.10 Water Balance and Rainwater Reuse

On a site of this scale a large quantity of surface runoff is expected throughout the year. Whilst storage has been provided to capture and detain some of this water (e.g. tanks and onsite storage detention basin), only a fraction of it would realistically be used to meet the development's water demand and the vast majority of the water would ultimately leave the Site via the Stony Creek watercourse as per existing conditions.

The following water demand end uses to be required during the operation of the Proposed Development:

- Toilet and urinal flushing, hand basin washing – around 20L/person/day;
- Kitchen (food preparation, washing), drinking;
- Air conditioning cooling;
- Internal cleaning;
- Truck wash;
- External cleaning; and
- Plant watering.

In the absence of development-specific water demand information (e.g. proposed number of toilets), the following provide a reasonable approximation for an industrial site per WaterNSW's current MUSIC Guidelines:

- For internal use – 0.1 kL/day/1,000 m^2 of roof area; and
- For external use – 20 kL/year/1,000 m^2 of external landscape area.

Additionally, it is considered likely that the brick manufacturing process will require a significant quantity of water for cooling and washing etc. In the absence of detailed information about process requirements a generic allowance has been outlined in **Table 43** below.

Table 43: Total Site Water Reuse Demand		
	Area (m^2)	**kL/day**
Total Roof Area	33,800	3.38
Total External Landscape Area	43,600	2.39
Process Use (for Manufacturing)	-	10.0
Total		15.77 kL/day

Furthermore, the use of rainwater collected in rainwater tanks from roof runoff provides a valuable alternative to potable water for a variety of non-potable end uses. At&l have assumed for the Proposed Development, that irrigation and toilet flushing will be plumbed to the rainwater tanks. Other uses such as truck / forklift washdown facilities may be considered at the Detailed Design phase. Accordingly, modelling results suggest that the 2 x 180 kL rainwater harvest tanks proposed will be sufficient for providing over 80% of the Proposal's reuse capabilities.

6.10 CONTAMINATION

The *Preliminary Site Investigation* (2019) prepared by Senversa Pty Ltd (Senversa) investigates the potential for contamination across the Subject Site to understand the liability associated with contamination resulting from current and historical land use practices and any constraints to the Proposed Development, particularly the suitability of the Site for the proposed land use.

The Preliminary Site Investigation (PSI) was performed by Senversa (2019) in accordance with the National Environment Protection Council (Assessment of Site Contamination) Measure 1999 (as amended May 2013) (NEPM) (2013) and comprised a desktop review of available information and a site inspection.

Senversa note, that a NSW Environment Protection Authority (EPA) contaminated land database search conducted for the Site and a 1 km buffer area provided, that there are no records of contaminated land for the Site and its surroundings.

Accordingly, a site inspection was undertaken on 29 October 2019, for which general waste such as tyres, plastic, metal scraps and potential ACM were observed where the farmhouse used to be located, as well as in the southeast portion of the Site, where stockpiles of dumped material, some containing potential ACM were observed.

Senversa (2019) note, that as the Site is generally unsealed, surface waters are likely to flow towards the lower portions of the Site, potentially accumulating during heavy rain. At the time of the Site inspection, one artificial dam was observed in the Site's southeast. The Site was noted to be free from visual or olfactory indications of contamination, such as staining and / or odours.

Based on the Site history, background data reviewed and Senversa's prior experience, the Contaminants of Potential Concern (COPC) associated with current and historical land uses undertaken in the general area are considered to include the following, as demonstrated in **Figure 36** below.

	Potential Source	Contaminants of Potential Concern	Comments
On site	Potential Source 1 – historical asbestos in building structures.	Asbestos containing materials (ACM).	Farmhouse and / or farm structures present on-site since the 1940s.
On site	Potential Source 2 – presence of septic tanks	Coliforms (total and faecal), nutrients, nitrates, heavy metals and phosphates.	Potential for leakage due to the presence of the old structure.
On site	Potential Source 3 – historical application of herbicides/ pesticides	Ammonium thiocyanate, 2,4,5-T and 2,4-D, herbicides (triazine, atrazine, 2-methyl-4-chlorophenoxyacetic Acid (MCPA), bipyridyls, sulfonyl ureas, chlorophenoxys) and heavy metals (copper, chromium, arsenic, mercury), organochlorine and organophosphate pesticides (OCP/OPPs).	Potential for pesticides/herbicides being sprayed on-site to avoid vegetation growth.
Off-site	Potential Source 4 – historical surrounding commercial/agricultural land uses	Asbestos containing material (ACM), total recoverable hydrocarbons (TRH), benzene, toluene, ethylbenzene and xylenes (BTEX), polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), OCP/OPP, volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs) and heavy metals.	The surrounding area has historically been used for light industry and agriculture.

Figure 36 Contaminants of Potential Concern (Source: Senversa, 2019)

Based on the results of the PSI, Senversa have developed a Conceptual Site Model (CSM) that outlined potential source and pathway receptor linkages, with potentially complete pollutant linkages, resulting from:

- Historical asbestos building structures.

Senversa (2019) conclude by noting, that an RAP is required to manage ACM present on-site and to further mitigate any potential risks to current and future on-site and offsite receptors.

6.11 TRAFFIC AND TRANSPORT

The *Transport Assessment: State Significant Development Application – Proposed Brickmaking Plant* considered the potential traffic impacts of the Proposed Development (refer to **Appendix 11**).

The Site has frontages to Berrima Road to the west and the New Berrima Clay/Shale Quarry to the north. Nearby key roads include (refer to **Figure 37** below):

- Berrima Road – a sub-arterial road;
- Taylor Avenue – a local road;
- Old Hume Highway – a regional road; and
- Hume Highway – a classified RMS Highway.

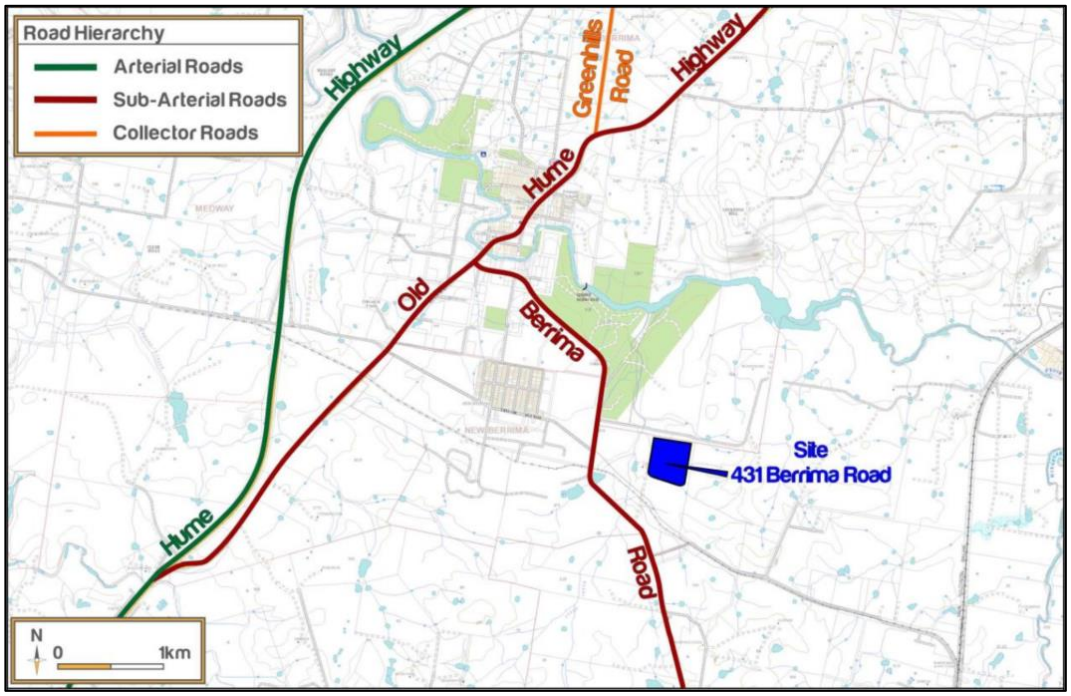

Figure 37 Road Hierarchy (Source: Ason Group, 2020)

The Site is located around 5-6 km from Moss Vale Station. Moss Vale Station is serviced by the Southern Highlands Line and Southern NSW Line, and provides connection to Campbelltown, Canberra and Sydney CBD. The Southern Highlands Line arrives at Moss Vale Station with approximately one-hour frequencies each way throughout the day. The Site is also serviced by bus stops within 1 km walking distance of the Site. The 812 service (Berrima to Moss Vale via Medway) connects the surrounding area to the nearest railway line at Moss Vale Station, with two-hour frequencies each way between 7:45am and 4:20pm.

The largest vehicle to access the Site as part of the Proposed Development would be a 26 m B-Double truck. The following surrounding roads are approved for 25/26 m B-Doubles:

- Berrima Road, south of Taylor Avenue;
- The entire length of Taylor Avenue;
- Old Hume Highway south of Taylor Avenue;
- Medway Road east of Hume Motorway on-ramp;
- The entire length of Hume Motorway; and
- The entire length of Douglas Road.

Traffic Count Surveys were undertaken between 2-8 March 2018 to determine traffic volumes along Berrima Road and Taylor Avenue. Existing heavy vehicle volumes along Berrima Road represent 6% and 2% of traffic during the morning and evening peak hours respectively. For Taylor Road these percentages are 14% and 11% respectively. Both roads therefore currently operate with a Level of Service of A.

The Proposed Development would:

- Generate up to 115 trucks accessing the Site per day, equating to 230 movements to and from the Site in total.
- The facility would have a total of **36 employees** including:
  - 24 factory employees (12 per shift, shift one starts at 5am to 1pm, shift two starts at 1pm and finishes at 9pm);
  - 10 administration staff and 2 laboratory staff (office hours); and
  - There will be 36 employees on the Site during a shift at any one time.

6.11.1 Traffic Assessment

In total, there would be 26 vehicle movements to / from the Site during the peak hours. This includes:

- 14 heavy vehicle movements (7 arrival trips and 7 departure trips) and 12 inbound light vehicle movements during the morning peak hour (8:00am – 9:00am).
- 14 heavy vehicle movements (7 arrival trips and 7 departure trips) and 12 outbound light vehicle movements during the evening peak (5:00pm-6:00pm).

All trucks will travel to and from the Site via Taylor Avenue, and then via the following routes (refer to **Figure 38** below):

- For trucks travelling to / from the north, the route would take them via the M31 Hume Motorway, onto Medway Road, which connects with Taylor Avenue at the Medway Road / Taylor Avenue / Old Hume Highway roundabout.
- For trucks travelling to / from the south, the route would take them via the M31 Hume Motorway, onto the Old Hume Highway, which connects to Taylor Avenue at the roundabout.

For light vehicles, a 50:50 split has been assumed between cars travelling along Berrima Road and Taylor Avenue.

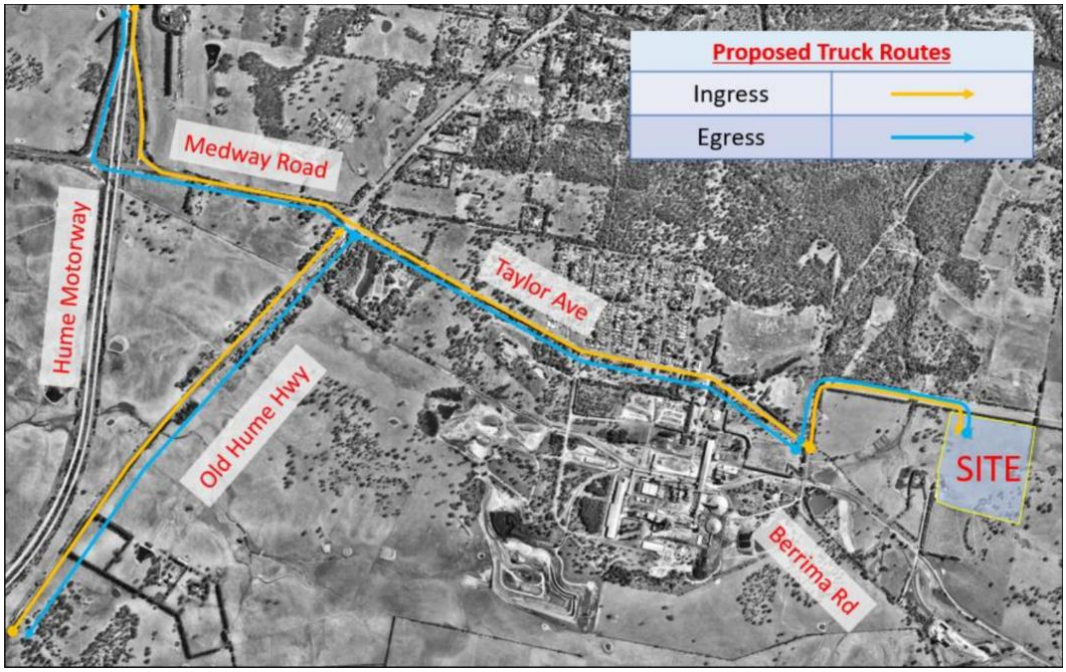

Figure 38 Heavy Vehicle Route Map (Source: Ason Group, 2020)

The impact of the Proposed Development alongside the additional traffic generated by the quarry and the masonry plant on the critical intersections in the locality have been assessed as a net increase over and above the existing on-street conditions, for which the results of this analysis are outlined in **Table 44** below.

Table 44: Local Network Performance, Cumulative Future Scenario

Intersection	Control Type	Period	Intersection Delay	Level of Service
Berrima Road / Taylor Avenue	Priority	AM	7	A
		PM	7	A
Old Hume Highway /	Roundabout	AM	17	B
		PM	16	B

Medway Road / Taylor Avenue				
Mereworth Road / Hume Highway Off Ramp	Priority	AM	7	A
		PM	7	A
Mereworth Road / Hume Highway On Ramp	Priority	AM	15	B
		PM	8	A
Medway Road / Hume Highway Off Ramp	Priority	AM	8	A
		PM	8	A
Medway Road / Hume Highway On Ramp	Priority	AM	8	A
		PM	8	A

As outlined in **Table 44** above, the SIDRA analysis indicates that the net traffic volumes arising from the Proposed Development would result in only minor increases in DOS and AVD and importantly, LOS would remain unchanged. In summary the traffic impact analysis concludes that the net traffic generation volumes are of a sufficiently low order, that once distributed onto the surrounding network, the impacts of these volumes at the key intersections would be negligible and the intersections would operate as currently occurs.

Regarding impacts on Berrima Road, there would be an additional 68 vehicles (22 light vehicles and 46 heavy vehicles) on Berrima Road and an additional 59 vehicles (13 light vehicles and 46 heavy vehicles) on Taylor Avenue. Accordingly, following completion of the Proposed Development and in conjunction with the approved quarry, the heavy vehicle volumes will represent 25% and 26% in the morning and evening peak hours respectively along Berrima Road (refer to **Figure 39** below). Additionally, following completion of the Proposed Development and in conjunction with the approved quarry, the heavy vehicle volumes will represent 23% and 23% in the morning and evening peak hours along Taylor Avenue (refer to **Figure 40** below).

Road	Existing			With Development + Quarry + Masonry Plant		
	Lights	Heavies	Total	Lights	Heavies	Total
AM (8.00 – 9.00)	142	9	151	164	55	219
PM (5.00 – 6.00)	121	3	124	143	49	192

Figure 39 Berrima Road Existing vs Development + Quarry + Masonry Plant Traffic Flows (Source: Ason Group, 2020)

Road	Existing			With Development + Quarry + Masonry Plant		
	Lights	Heavies	Total	Lights	Heavies	Total
AM (8.00 – 9.00)	295	48	343	308	94	402
PM (5.00 – 6.00)	235	28	263	248	74	322

Figure 40 Taylor Avenue Existing vs Development + Quarry + Masonry Plant Traffic Flows (Source: Ason Group, 2020)

Accordingly, extrapolation of the NSW RMS Guide's Rural Road Midblock LOS indicates that to reach a LOS of 'B', for a level two-way rural road for 25% heavy vehicles, there needs to be a total of 470 vehicles at the midblock. Berrima Road with 219 vehicles in the peak hours and 25% heavy vehicles would continue to operate at a very good LOS, being 'A'. Similarly, Taylor Avenue with 402 vehicles per hour and 23% heavy vehicles would also operate at LOS 'A'.

6.11.2 Car Parking

The MVECDCP provides the car parking requirements for new industrial development within the MVEC. Accordingly, the following parking controls are provided by Council:

- Factory: One (1) space per 100 m^2 of factory GFA, or one (1) space per two (2) employees, whichever is the greater.
- Factory Office: One (1) space per 40 m^2 of Office GFA.

Application of Council's parking rates to the proposed factory and office yields provides for the following requirement as outlined in **Table 45**.

Table 45: Car Parking Rates

Land Use	Yield	Parking Rate	Parking Required	Provisions
Factory	26,145 m^2	1 space per 100 m^2	261	59
Office	895 m^2	1 space per 40 m^2	22	
Total	-	-	283	59

Given that the operational requirements of the Proposed Development would warrant only 36 car parking spaces, the parking requirement and justification utilised by Ason Group (2020) has been based on a first principles assessment to account for the unique characteristics of the Proposed Development.

It is expected that all staff would use their private vehicle to commute to work due to the Site's remote location and lack of public transport. This would incur a parking rate of one (1) space per employee. The only time period where all 36 employees are on-site would be during shift change over periods at 1:00pm.

Therefore, the Proposed Development has provided 59 car parking spaces, which would accommodate all operational and visitor parking demands of the Proposed Development. The Proposal can therefore accommodate the parking demand it generates within the confines of the Site. Additionally, the Proposed Development includes provisions for one (1) accessible car parking space which complies with the relevant Standards.

6.11.3 Site Access Design

The Site access, car park and loading areas have been designed to comply with the following relevant Australian Standards:

- AS2890.1 for car parking areas;
- AS2890.2 for commercial vehicle loading areas; and
- AS2890.6 for accessible (disabled) parking.

Furthermore, all service vehicles can enter and exit the Site in a forward direction. The existing quarry access driveway to the north of the Site would be upgraded in accordance with AS2890.2 to accommodate heavy vehicle access for the Proposed Development.

The operation of the Proposed Development would not have any significant impacts on the surrounding road network, and the transport scheme for the Proposed Development can also operate according to the relevant standards.

6.11.4 Construction Traffic Management Plan (CTMP)

Construction of the Proposed Development would generate a moderate increase in traffic on the surrounding road network. While the construction program for the Proposed Development has not yet been finalised, the following general principles for managing construction traffic have been assumed:

- On-site parking for key contractors and staff would be provided throughout the construction works. The number and location of this temporary on-site car parking would change throughout the various construction phases, depending on the surplus area available not required for truck loading and turning areas;
- Construction works would be undertaken during standard construction-working hours. However, it may (on occasion) be necessary to undertake night works to minimise disruption to traffic. Any such works undertaken outside of standard construction hours would only occur with prior approval from Council;
- Vehicle entry and exit movements to the Site would be in a forward direction only, with spoil; and
- to be loaded within the Site and under the careful supervision of an authorised traffic controller.

A detailed Construction Traffic Management Plan would be provided as part of the detailed construction management plan submitted under the conditions of any approval. This would include the following measures to minimise the impacts of construction traffic:

- Disruption to road users would be kept to a minimum by scheduling intensive delivery activities outside of peak network hours;
- Supervised traffic control would be required where two-way flow is restricted over any length of the roadway, depending on the number of truck movements required and would be managed outside of peak hour vehicle activity;
- It is proposed that construction vehicles enter and exit the Site via the same routes to be used when the Site is operational**.** A copy of the truck routes would be provided to all drivers prior to attending the Site. The proposed routes representing the shortest means of transport between the local and regional road networks consist of:
    - Entering the Site from the north: exit left onto the off-ramp off the Hume Motorway, turning left onto Medway Road, then straight across the roundabout to Taylor Avenue, then left onto Berrima Road before entering the Site;
    - Entering the Site from the south: exit left onto the off-ramp of the Hume Motorway, turning right onto Old Hume Highway, then right at the

roundabout to Taylor Avenue, then left onto Berrima Road before entering the Site;
    - Exiting the Site to travel north: turn left onto Berrima Road, then right onto Taylor Avenue, then straight across the roundabout to Medway Road, then right onto the Hume Motorway on-ramp; and
    - Exiting the Site to travel south: turn left onto Berrima Road, then right onto Taylor Avenue, then left at the roundabout to Old Hume Highway, then left onto the Hume Motorway on-ramp to head south;
- Trucks would not queue on local roads; and
- Two-way radios would be used to coordinate truck arrivals.

With the abovementioned management measures in place, any traffic impacts caused during the construction of the Proposed Development can be mitigated to an appropriate level of impact.

6.12 WASTE MANAGEMENT

The *Waste Management Plan: Brick Manufacturing Facility* (LG Consult, 2018) considered the potential waste management impacts of the Proposed Development (refer to **Appendix 19**).

The Proposed Development does not anticipate any extensive demolition, remediation, estate infrastructure and estate landscaping works and the only significant waste to be generated by the Proposed Development would be construction wastes, including those generated during:

- Bulk and detailed earthworks to building pad works;
- Construction of brick manufacturing plant structures and related amenities across the Site; and
- Construction of lead-in services, including electricity, gas, sewer and potable water.

6.12.1 Construction Waste

The estimated construction waste quantities are summarised in **Table 46** below.

Table 46: Estimated Construction Waste

Types of Waste Generated	Reuse	Recycling	Disposal	Method of on-site reuse, contractor and recycling outlet and / or waste depot to be used
	Estimate Volume (m^3) or Weight (t)	Estimate Volume (m^3) or Weight (t)	Estimate Volume (m^3) or Weight (t)	
Excavated materials	<1,000 m^3	0	0	N/A
Green Waste	0	0	0	N/A
Bricks / Pavers	0	0	<5 m^3 (offcuts)	Waste Management Centre
Tiles	0	0	<2 m^3 (offcuts)	Waste Management Centre
Concrete	0	0	<10 m^3	Waste Management Centre

Plasterboard	0	0	<5 m^3	Waste Management Centre
Asbestos	0	0	0	N/A
Metal – specify	0	<10 m^3	0	Recycling Outlet
Timber – specify	0	0	0	N/A
Other Waste – specify (e.g. paints, PVC tubing)	0	0	<5 m^3 (offcuts)	Waste Management Centre
Packaging (used pallets, pallet wrap)	0	<10 m^3	0	Recycling Outlet
Containers (cans, plastics, glass)	0	<2 m^3	0	Recycling Outlet
Paper / cardboard	0	<5 m^3	0	Recycling Outlet
Total	**<1,000 m^3**	**<27 m^3**	**<27 m^3**	

Accordingly, waste-type-specific reduction measures will be employed during the proposed construction stage, with the following specific procedures:

- Applying practical building designs and construction techniques;
- Appropriate sorting and segregation of demolition and construction wastes to ensure efficient recycling of wastes;
- Selecting construction materials taking into consideration to their long lifespan and potential for reuse;
- Ordering materials to size and ordering pre-cut and prefabricated materials;
- Reuse of formwork (where possible);
- Planned work staging;
- Reducing packaging waste on-site by returning packaging to suppliers where possible, purchasing in bulk, requesting cardboard or metal drums rather than plastics, requesting metal straps rather than shrink wrap and using returnable packaging such as pallets and reels;
- Careful on-site storage and source separation;
- Subcontractors informed of site waste management procedures; and
- Coordination and sequencing of various trades.

LG Consult (2020) note, that the anticipated beneficial reuses of construction waste are summarised as follows:

- Concrete, tiles and bricks will be reused onsite or reused/recycled offsite;
- Waste oil will be recycled onsite or disposed offsite of in an appropriate manner;
- All solid waste timber, brick, concrete, tiles and rock that cannot be reused or recycled will be taken to an appropriate facility for treatment to recover further resources or for disposal to landfill in an approved manner;
- All asbestos, hazardous and/or intractable wastes are to be disposed of in accordance with Workcover Authority and EPA requirements;
- Portable, self-contained toilet and washroom facilities will be provided at the Site and will be regularly emptied and serviced by a suitably qualified contractor;
- Provision for the collection of batteries, fluorescent tubes and other recyclable resources will be provided onsite to enable offsite recycling;
- Drink container recycling should be provided onsite or these items sorted offsite for recycling at an appropriately licensed facility;

- All garbage will be disposed of via a council approved system; and
- Opportunities for materials exportation and reuse with other local construction operations will be investigated.

6.12.2 Operational Waste

The estimated weekly operational waste quantities are outlined in **Table 47** below.

Table 47: Estimated Construction Waste

Types of Waste Generated	Reuse	Recycling	Disposal	Method of on-site reuse, contractor and recycling outlet and / or waste depot to be used
	Estimate Volume (m^3) or Weight (t)	Estimate Volume (m^3) or Weight (t)	Estimate Volume (m^3) or Weight (t)	
Excavated materials	0	0	0	N/A
Green Waste	0	0	0	N/A
Bricks / Pavers	<2 m^3	0	0	N/A
Tiles	0	0	0	N/A
Concrete	0	0	0	N/A
Plasterboard	0	0	0	N/A
Asbestos	0	0	0	N/A
Metal – specify	0	0	0	N/A
Timber – specify	0	0	0	N/A
Other Waste – specify (e.g. paints, PVC tubing)	0	0	<2 m^3 (GSW)	Waste Management Centre
Packaging (used pallets, pallet wrap)	0	<5 m^3	0	Recycling Outlet
Containers (cans, plastics, glass)	0	<2 m^3	0	Recycling Outlet
Paper / cardboard	0	<5 m^3	0	Recycling Outlet
Total	**<2 m^3**	**<12 m^3**	**<2 m^3**	

Furthermore, waste-type-specific reduction measures will be employed during the proposed operational phase, which includes the following specific procedures:

- Provision of take back services to clients to reduce waste further along the supply chain;
- Re-work/re-packaging of products prior to local distribution to reduce waste arising;
- Review of packaging design to reduce waste but maintain 'fit for purpose';
- Investigating leased office equipment and machinery rather than purchase and disposal;
- Establish systems with in-house and with supply chain stakeholders to transport products in re-useable packaging where possible;
- Development of 'buy recycled' purchasing policy;
- Flatten or bale cardboard to reduce number of bin lifts required; and

- Providing recycling collections within each of the offices and tearooms (e.g. plastics, cans and glass).

Additionally, the anticipated beneficial reuses of operational waste are outlined below:

- Cardboard, paper, plastic, glass, cans and pallets and containers will be reused/recycled offsite;
- Provision for the collection of batteries, fluorescent tubes and other recyclable resources will be provided on site to enable offsite recycling;
- All waste materials that cannot be reused or recycled will be taken to an appropriate facility for treatment to recover further resources or for disposal to landfill in an approved manner;
- Waste oil (if any) used in equipment maintenance will be recycled or disposed of in an appropriate manner; and
- Opportunities for materials exportation and reuse with other local industrial operations will be investigated. This will have two benefits: minimising energy through reduction of material reprocessing, encouraging material reuse.

With these management measures in place, any waste impacts resulting from either the construction or operational use of the Proposed Development can be mitigated to an appropriate level of impact.

The complete WMP is located in **Appendix 19** of this EIS.

6.13 ECOLOGICALLY SUSTAINABLE DEVELOPMENT

The *New Berrima Brickworks Facility 416-524 Berrima Road, Moss Vale NSW Ecological Sustainable Development Report* (Wood & Grieve Engineers, 2020) is provided in **Appendix 20**. It provides an overview of the Ecologically Sustainable Development (ESD) principles and sustainability initiatives to be incorporated within the Proposed Development. The Proposed Development would include ESD as benchmarked in the following:

- The SEARs;
- The EP&A Act;
- The EP&A Regulation;
- The WLEP 2010;
- The WDCP 2008; and
- The National Construction Code – Section J – Energy Efficiency provisions.

The proposed office design includes the following energy efficient design elements:

- Shading across glazing;
- Zoned mechanical systems (centre/perimeter);
- Wider temperature control band;
- Increased mechanical equipment performance;
- Increased lighting efficiency; and
- Combining the above elements.

A number of models were developed to investigate the effects of changing a number of the design elements. The office to the largest warehouse was modelled as it was considered the most representative. The modelled elements included annual energy consumption for:

- Improved mechanical systems;
- Zoned mechanical systems;
- Glazing shades;
- Wider temperature band; and

- Reduced lighting.

Combining all of the modelled elements shows a reduced energy consumption of the building from the base case by 44%. Controlling for appliances which would also be required for the buildings to function, this results in savings of 56% compared to the baseline case.

The proposed warehouse design includes the following energy efficient design elements:

- Natural ventilation;
- Roof ventilators to reduce heat buildup and mould and to encourage air circulation;
- Encouraging natural lighting where possible through the use of translucent roof materials, targeting 10% across the warehouse roofing components;
- Rainwater harvesting and reuse; and
- Lighting controls including zoned switching, motion sensors and/or time clocks.

By providing an unconditioned space with natural ventilation, the key energy sources are lighting and plug loads. Plug loads are required for the function of the space and cannot be reduced. Lighting load can be reduced by 30% or even further by the introduction of zoned switching, time clocks and/or motion sensors, providing an energy efficient solution to the warehouse component of the development.

An estimation of total annual energy consumption savings for the warehouse components of the Proposed Development is 32%.

The following management measures are proposed in the *Ecological Sustainable Development Report* to ensure the Proposed Development complies with the principles of ecologically sustainable development:

- Design of the facility including functional layout, location of specific equipment, built form and associated operational activities would be given careful consideration as to comply with Austral Masonry's on-going Health, Safety and Environment Management System, specifically it's Environmental Policy, including:
    - Energy efficiency and greenhouse gas emissions reduction – plant design aims to identify and include initiatives that improve energy efficiency and reduce greenhouse gas emissions which in turn reduce the long-term risk of the impacts of climate change. Examples include location and proximity of key manufacturing processes resulting in less energy demand via reduced travel distances, smaller pumping requirements and improved natural daylight;
    - Identify and implement water management initiatives – for on-site reuse, including opportunities for rainwater harvest and re-use reducing the Proposed Development's reliance on mains potable water supply. On-site harvesting to only occur from identified 'clean' areas such as plant roof and nominated hard-stand areas only;
    - Implementation of waste management initiatives – ensuring proper handling and disposal of the plants waste streams ensuring the larger ecological footprint of the plant is minimised; and
    - Consideration of environmental issues – such as the conservation of virgin materials, resources and new product development;
- A site specific Safety, Health and Environment Management System inclusive of standard operating procedures has been identified by Austral Masonry and would be implemented during the operation of the new manufacturing plant. The following procedure are aligned to ensure the plant operations do not cause serious of irreversible environmental damage as follows:
    - Energy efficiency - regular energy audits (in accordance with AS/NZS 3598.2:2014) with a view to improve operational energy efficiency and

process reducing the long-term environmental risks associated with climate change;
    - Water efficiency – regular measurement and control of water usage levels in accordance with SHE-MSP-Env-10.336. The target for all Austral Masonry sites is to reduce mains potable water demand and replace with recycled sources as much as possible;
    - Waste Management - dedicated standard operating procedures across all Austral Masonry sites include appropriate facilities for effective waste separation and reduced waste for landfill, including:
        - General waste;
        - Co-mingled recycling;
        - Contaminated materials; and
        - Paper; and
    - Materials Management - the following approach to reducing virgin material usage and reduced ecological impact as identified within SHE-MSP-Env-07.334;
    - The Proposed Development would be managed with well-documented management approaches in place to ensure any threats of serious or irreversible environmental damage can be avoided or minimised as far as is reasonable practicable;
- The following measures would contribute to inter-generational equality at the Site:
    - High WELS rated water fittings ensuring lower building water demand;
    - On-site rainwater harvesting and reuse;
    - LED lights, which have longer lives, consume less energy and produce a higher quality light than their counterparts, reducing overall energy demand;
    - Energy and water metering for effective monitoring and demand reduction;
    - Low-VOC paints, sealants, adhesives, carpets (where applicable), which do not emit dangerous volatile components, risking the health of users;
    - Steel sourced from manufacturers who are members of the Australian Steel Institute Sustainability Charter for sustainable and energy reducing steel manufacture;
    - Best practice PVC plastics in formwork, piping, cables and conduits. These materials have a reputation for damaging the environment in their production, both upstream and downstream of the manufacturing process;
    - Operational waste procedures including defined streams for effective material recycling;
    - A target of 80% of construction and demolition waste would be diverted from landfill; and
    - On-site stormwater management in accordance with EPA/WSUD best practice guidelines;
- Further to the above, the following examples are envisaged to contribute to the conservation of biological diversity and ecological integrity:
    - On-site rainwater harvesting and reuse would reduce the Site discharge levels and maintain the overall health and ecological integrity of receiving water bodies;
    - Dedicated site boundary does not encroach on the existing watercourse and riparian zone, limiting the local impact to this zone; and
    - Targets for waste reduction during both construction and operation would reduce biological and ecological impacts in general via reduced waste to landfill;
- Contractors would be requested to provide and abide by an Environmental Management Plan and Environmental Management System that is in accordance with NSW Environmental Management Systems Guidelines. This places a value on environmentally responsible building practices and places a form of "polluter pays" onto the contractors to ensure they are held responsible for the environmental management of the building site as they complete their work;

- The cost to recycle the construction and demolition waste would be borne by the Proposed Development team. The Proposed Development team would be required to target 80% recycling of construction waste. The increased cost of recycling construction materials would also incentivise the purchase of less materials, thereby reducing over-ordering and material wastage;
- The costs of producing the following pollution: sewage, landfill waste, and CO2 emissions are partially borne by the Proposed Development team and accounted for in the Proposed Development's sustainability initiatives. The Proposed Development has voluntarily elected to:
    - Improve their water consumption efficiency, thereby paying to reduce production of sewage;
    - Reduce their energy consumption, which means the Proposed Development has paid for the design and implementation of solutions which would reduce CO_2 emissions;
    - Recycle waste streams in the construction and operation of the Proposed Development, which would cost more than standard practice where all material waste is directed to landfill;
- The following would be adopted by the Proposed Development to reduce waste from construction materials:
    - A high recycling target of 80% diversion from landfill for the construction and demolition waste;
    - Steel sourced from producers who are members of the Australian Steel Institute Sustainability Charter for responsible steel manufacture and energy reducing manufacturing techniques;
    - PVC materials would be procured from suppliers which comply with industry best practice guidelines for PVC manufacture which aims to reduce the environmental impact of PVC material production;
- The following additional energy efficiency measures would be implemented as part of the Proposed Development:
    - Façade design for optimised passive thermal performance. Processing plant would be naturally ventilated with the inclusion of large access openings and skylights to provide natural daylighting reducing energy demand;
    - Administration building would be designed to comply with minimum energy efficiency provisions as identified in national construction code – Section J – energy efficiency provisions;
    - Efficient lighting e.g. LEDs. This would reduce the electrical load on the grid for the same electrical output. Further, LED globes have a longer life, reducing replacement periods which demands less maintenance, as well as reducing landfill of precious materials – applicable to both administration building/ processing plant;
    - Lighting controls including timing and occupancy sensors to reduce the demand on the lighting systems;
    - Sub-metering would allow for effective energy management and optimisation of building performance;
    - Factory BMS building control would monitor and provide automated building operation and maximise energy efficiency;
    - External lighting to timeclock controlled for optimised energy efficiency;
    - Energy and water efficient appliances – lowering energy demand;
    - Localised hot water systems for lower GHG emissions impact and on demand response;
- The following additional water efficiency measures would be implemented as part of the Proposed Development:
    - Water efficient fixtures and fittings – includes taps, wash basins, WCs, Urinals, showers and supplementary water uses;
    - On-site rainwater harvest – offset for masonry manufacturing; and

  - Landscape irrigation supply would be also connected to existing on-site rainwater storage infrastructure reducing the demand from potable water supplies;
- The following additional design materials efficiency measures would be implemented as part of the Proposed Development:
  - Material selections, which focus on reducing volatile organic compounds (VOC) levels and minimise formaldehyde impacts. Paints, sealants, adhesives, carpets, floor and material finishes would all comply with best practice VOC criteria as identified within Green Star – industry best practice standard;
  - Engineered wood products would limit formaldehyde levels via architectural specification in accordance with industry best practice standards; and
  - Consideration of additional material specifications which select and prefer materials and products which include reused content, environmental product declarations, third party sustainability certifications or product stewardship programs;
- The following operational efficiency measures would be implemented as part of the Proposed Development:
  - Undertake regular operational energy audits to track performance, progress and inform future operational improvements in energy efficiency;
  - External energy audits - AS/NZS 3598.2:2014 (as required);
  - Maintenance periods to implemented to ensure equipment operational efficiency is maintained;
  - Comprehensive analysis for new equipment procurement to ensure overall plant operational efficiency is maintained; and
  - Regular reporting and disclosure around energy and GHG emission performance to drive future refinements and improved performance;
  - Separation of surface water for reuse and effective treatment prior to discharge reduces both potable water demand and improves stormwater quality leaving site;
  - Effective maintenance programs ensuring leak detection is timely identified
  - Sub-soil landscape irrigation systems; and
  - Regular reporting and disclosure around energy and GHG emission performance to drive future refinements and improved performance;
- A dedicated waste management plan would be prepared in accordance with SHE-MSP Env – 07.334 – Waste Management with specific response to the waste streams identified above and ensure the following is achieved:
  - General waste to landfill is reduced;
  - Co-mingled recycling activities are maximised - cardboard, plastics, glass;
  - Contaminated materials; and
  - Paper.

The Proposed Development's compliance with the specific requirements of the National Construction Code – Section J would be managed during the detailed design phase.

With the above management measures in place, the Proposed Development would comply with the relevant ESD requirements.

6.14 CONTRIBUTIONS

The Site is subject to the *Section 94 Developer Contributions Plan for The Moss Vale Enterprise Corridor 2013 to 2050*. Sections of the EP&A act were renumbered by a modification instrument on 28 February 2018. The former Section 94 of the EP&A Act is now Section 7.11.

The Moss Vale Contributions Plan applies to all developments which are permissible land uses in the IN1 General Industrial and IN3 Heavy Industrial zones within the Moss Vale Enterprise Corridor under the WLEP 2010. It primarily focuses on the proposed new road network and proposed upgrading of existing roads within the Enterprise Corridor to meet projected demands. Such upgrades include:

- Moss Vale Bypass Stages 1, 2 and 3;
- New Berrima Bypass Stages 1 and 2 and Berrima Road Blue Circle Railway Overpass;
- New Road (Enterprise Zone Road) – Parrallel and South of Blue Circle Southern Rail Extension;
- Rail overbridge connecting Douglas Road to New Road (Enterprise Zone Road);
- Douglas Road Upgrade;
- Berrima Road Upgrade; and
- Various Intersection Improvements.

The Moss Vale Contributions Plan excludes the operation of the *Wingecarribee Shire Council Section 94 Developer Contributions Plan for Administration Resources* from the land to which the Moss Vale Contributions Plan applies. However, it is understood that other Section 94 (now Section 7.11) Contributions Plans may still apply concurrently to the Site.

It is anticipated that the payment of a Section 7.11 levy prior to the issue of a Construction Certificate for the proposed works would be required as a Condition of Development Consent. This would be based on the Site area of the Proposed Development, as well as other factors to be calculated by Council under its Contributions Plans.

6.15 ABORIGINAL CULTURAL HERITAGE

Biosis (2020) have undertaken and prepared an Aboriginal Cultural Heritage Assessment Report (ACHAR) for the Proposed Development. The ACHAR provided includes the details of the investigation undertaken, Aboriginal community consultation, and the assessment of Aboriginal Cultural Heritage undertaken for the purpose of the assessment provided by Biosis (2020), which is located in **Appendix 22** & **23** of this EIS Submission.

The investigation undertaken has been carried out under Part 6 of the *National Parks and Wildlife 1974* (NPW Act). Additionally, it has been undertaken in accordance with the *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW 2010b) (the Code).

A search of the Aboriginal Heritage Information Management System (AHIMS) database identified 90 Aboriginal archaeological sites within a five (5) km sear area, centred within the Study Area (refer to **Figure 41** below). It is noted, that two (2) of these registered sites are located within the Study Area. Biosis note, that some recorded sites consist of more than one element, for example artefacts and a modified tree; however, for the purposes of the information within the ACHAR and the predictive modelling, all individual site types have been studied and compared for consistency and completeness. This explains why there is a total of 95 results outlined in **Table 48** below, compared to the 90 identified by the AHIMS search.

Table 48: AHIMS Site Type Frequency

Site Type	Number of Occurrences	Frequency (%)
Artefact	72	75.79
Grinding Groove	7	7.37
PAD	12	18.46
Modified Tree	4	4.21
Total	95	100.00

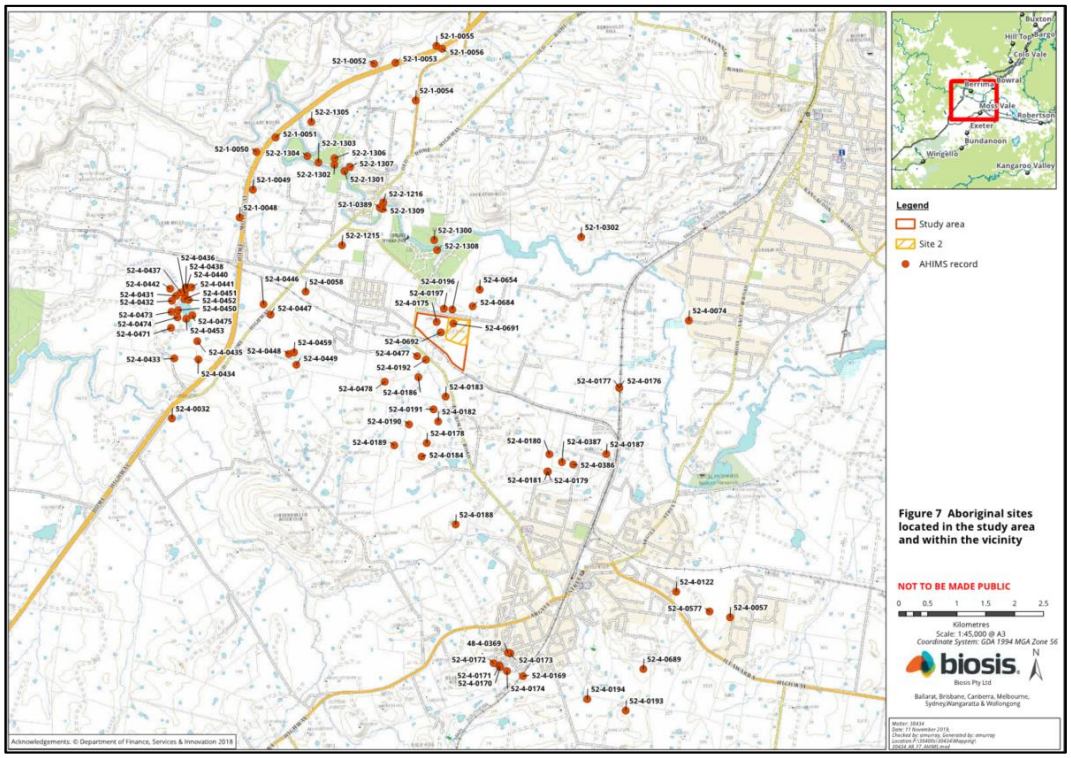

Figure 41 Aboriginal Sites Located in the Study Area and within the Vicinity (Source: Biosis, 2020)

Pursuant to the AHIMS Search, an archaeological survey was undertaken by Biosis (refer to **Appendix 22**), which consisted of a meandering foot transect, which targeted all portions of the study area (refer to **Figure 42** below). Biosis note, that the previously recorded AHIMS 52-4-0691 (CPark A02) and AHIMS 52-4-0196 (Stoney Creek 1) were easily relocated during the archaeological survey; however, AHIMS 52-4-0692 (CPark A03) was unable to relocated.

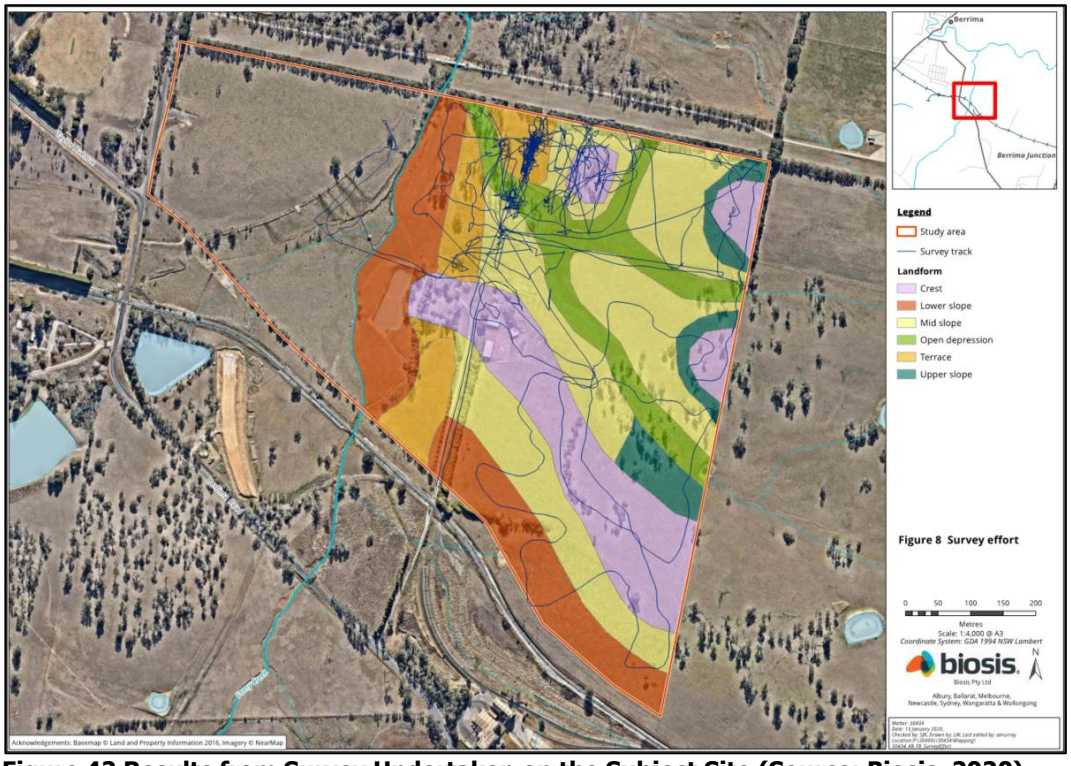

Figure 42 Results from Survey Undertaken on the Subject Site (Source: Biosis, 2020)

Biosis (2020) confirm, that there are no specific historical references to Aboriginal occupation of the study area; however, the type of sites located within the study area and the results of the test excavations as part of the Stage 1 development attest to the presence of Aboriginal people in the past. Accordingly, the results of both the survey and test excavations undertaken confirmed, that the presence of stone artefacts is linked directly to distance streams and that the presence and frequency of surface artefacts sites is not a reliable indicator of subsurface frequencies.

This is further supported by the results of the subsurface test excavations within Stage 1 where a total of 427 artefacts were recorded, with the highest density of artefacts recorded within 100 m of Stoney Creek in the northeast corner of the Stage 1 area adjacent to a suite of grinding grooves.

In accordance with the relevant consultation guidelines with regard to Aboriginal Cultural Heritage, Biosis notified the following bodies regarding the Proposed Development:

- Wingecarribee Shire Council.
- EES Group.
- Native Title Services Corporation Limited (NTSCORP Limited).
- Office of the Registrar, *Aboriginal Land Rights Act 1983* of Aboriginal Owners.
- NNTT.
- South East Local Land Services.
- Illawarra LALC.

Accordingly, the heritage assessment criteria prescribed in NSW falls broadly within the significance values outlined in the Australia International Council on Monuments and Sites (ICOMOS) *Burra Charter: The Australia ICOMOS Charter for Places of Cultural Significance* (Australia ICOMOS 2013) (the Burra Charter). The values assessed pertain to the following:

- Historical Significance;
- Aesthetic Significance;
- Social Significance; and
- Scientific Significance.

Within the study area, there are 134 recorded Aboriginal sites that will be subject to harm, for which the degree of harm incurred to these Aboriginal archaeological sites from the construction phase of the Proposed Development would range from partial to direct impacts. A summary of the potential impacts of the Proposed Development on known Aboriginal sites within the study area is outlined in **Table 49** below.

Table 49: Summary of Potential Archaeological Impact

AHIMS Site No.	Site Name	Significance	Type of Harm	Degree of Harm	Consequence of Harm
52-4-0691	CPark A02	Low	Direct	Total	Total loss of value
52-4-0692	CPark A03	Low	Direct	Total	Total loss of value
52-4-0196	Stoney Creek 1	High	Direct	Partial	Partial loss of value
52-4-0701	CPark A04 PAD	Moderate	Direct	Partial	Partial loss of value
52-4-0696	CPark A05	Low	Direct	Total	Total loss of value
52-4-0695	CPark A06	Low	Direct	Total	Total loss of value
52-4-0694	CPark A07	Low	Direct	Total	Total loss of value

52-4-0693	CPark A08	Low	Direct	Total	Total loss of value
52-4-0702	CPark A09	Low	Direct	Total	Total loss of value
52-4-0703	CPark A10	Low	Direct	Total	Total loss of value
52-4-0698	CPark A11	Low	Direct	Total	Total loss of value
52-4-0697	CPark A12	Low	Direct	Total	Total loss of value
52-4-0699	CPark A13	Low	Direct	Total	Total loss of value
52-4-0700	CPark A14	Low	Direct	Total	Total loss of value

With regard to **Table 49** outlined above, the Proposed Development works within the study area include activities which would impact approximately 13 Aboriginal Cultural Heritage sites. If these sites are not mitigated appropriately, the impacts may include:

- Vehicle movement within the study area with potential compaction of surface soils.
- Earthworks which will involve the removal of topsoil and subsoil.
- Construction of a brick making plant and associated infrastructure such as roads and services.

Biosis note, that if the study area was left unmitigated, these activities have potential to completely remove or disturb archaeological deposits and Aboriginal objects. Notwithstanding, harm cannot be avoided to some Aboriginal sites within the study area with respect to the Proposed Development. CPark A02 and CPark A03 are isolated surface artefacts, which can be subject to a surface salvage as part of an Aboriginal Cultural Heritage Management Plan (refer to **Appendix 23**).

Furthermore, Stoney Creek 1 was relocated during the survey and test excavations for Site 2 identified a moderate density, intact subsurface and archaeological deposit within a slightly elevated terrace landform. It is noted, that the grinding grooves and associated PAD are outside of the Proposed Development area and will be impacted as a result of the Proposal. However, the associated site identified as CPark A04 PAD, located south of Stoney Creek 1, will be partially impacted by the Proposed Development, as will the remaining 11 Aboriginal sites.

As a result of the investigations, excavations and consultation with the Registered Aboriginal Parties (RAPs), the following recommendations have been provided by Biosis to be implemented for the Proposal:

Recommendation 1: Conservation of Part of AHIMS 52-4-0196 (Stoney Creek 1)

Stoney Creek 1 (AHIMS 52-4-0196) was relocated during the survey and the test excavations within Site 2 identified a moderate density, intact subsurface archaeological deposit within a slightly elevated terrace landform associated within the grinding grooves. The grinding grooves and subsurface artefact scatter are outside of the Proposed Development footprint and will not be impacted. Notwithstanding, the grinding grooves should be protected with a buffer and fencing.

Recommendation 2: Aboriginal Cultural Heritage Management Plan

The current Aboriginal Cultural Heritage Management Plan (ACHMP) should be updated pursuant to consultation with the RAPs and EES to include the proposed Site 2 study area. The ACHMP will facilitate the implementation of the management and mitigation strategies

for all 14 sites located within the study area by clearly outlining Aboriginal site management requirements including the management of unexpected finds.

Recommendation 3: Continued Consultation with the Registered Aboriginal Parties

The Proponent should continue to inform the RAPs about the management of Aboriginal Cultural Heritage sites within the study area throughout the life of the project. Biosis confirm that the final report will be sent to the RAPs, EES and the AHIMS Register for further review.

6.16 NON-ABORIGINAL HERITAGE

The *Historical Heritage Assessment* (Biosis, 2020) was undertaken to inform the Proposed Development in accordance with current heritage guidelines, including *Assessing Heritage Significance, Assessing Significance for Historical Archaeological Sites and 'Relics'* and the *Burra Charter*[1].

An assessment of heritage significance encompasses a range of heritage criteria and values. The heritage values of a site or place are broadly defined as the 'aesthetic, historic, scientific or social values for past, present or future generations.' This means a place can have different levels of heritage value and significance to different groups of people. Accordingly, **Table 50** outlined below demonstrates an evaluation and subsequent statements of significance for the possible archaeological material located within the study area.

[1] NSW Heritage Office 2001; NSW Heritage Branch, Department of Planning 2009; Australia ICOMOS 2013.

Table 50: Evaluation and Statement of Significance for Possible Archaeological Material within the Study Area									
Item	**Significance Assessment Criteria**							**Level of Significance**	**Statement of Significance**
	A	**B**	**C**	**D**	**E**	**F**	**G**		
Features associated with early land ownership and early farming practices								Nil	*The possible archaeological material associated with the early land ownership of the study area and farming practices, such as post holes and fence lines are not considered an important component of the cultural history of NSW or New Berrima and they are not associated with the life or works of a person(s) of importance in local or state cultural history. These possible materials will not yield information that will contribute to a greater understanding of the cultural history of NSW or the New Berrima, and they are unlikely to demonstrate aesthetic characteristics or a high degree of creative or technical achievement in the state or local area, They do not hold a strong or special association with a community or cultural group for social, cultural or spiritual reasons in NSW or New Berrima. The possible archaeological materials are not considered to possess uncommon, rare or endangered aspects of NSW or New Berrima's cultural history, nor do they demonstrate the principal characteristics of a class of cultural places or environments within the state or local area. The archaeological materials associated with the early land ownership and farming practices within the study area do not hold heritage significance.*
Features associated with the mid-20th Century house [1] and homestead [2-23]								Nil	*The possible archaeological material associated with the mid-20th century house and homestead, such as building footings, post holes, rubbish deposits and occupation deposits are not considered an important component of the cultural history of NSW or New Berrima and they are not associated with the life or works of a person(s) of importance in local or state cultural history. These possible materials will not yield information that will contribute to a greater understanding of the cultural history of NSW or the New Berrima, and they are unlikely to demonstrate aesthetic characteristics or a high degree of creative or technical achievement in the state or local area, They do not hold a strong or special association with a community or cultural group for social, cultural or spiritual reasons in NSW or New Berrima. The possible archaeological materials are not considered to possess uncommon, rare or endangered aspects of NSW or New Berrima's cultural history, nor do they demonstrate the principal characteristics of a class of cultural places or environments within the state or local area. The archaeological materials associated with the mid-20th century house and homestead or associated outbuildings.*

It is noted, that the potential impacts to the study area for the Proposed Development works are considered acceptable, as there are no items of heritage significance with the study area, that will be impacted by these activities, provided that an unexpected finds policy is implemented to identify and record any archaeological material that may be encountered during the proposed works.

The following recommendations have been formulated to respond to client requirements and the significance of the Site. They are guided by the ICOMOS Burra Charter with the aim of doing as much as necessary to care for the place and make it useable and as little as possible to retain it cultural significance.

Recommendation 1: No Further Historical Heritage Assessment Required

The assessment undertaken by Biosis has identified no items of heritage significance or archaeological potential within the study area. As such, no further historical heritage assessment is required. Should unanticipated relics be discovered during ground disturbance, an unexpected finds procedure should be implemented as outlined in Recommendation 2 below.

Recommendation 2: Unexpected Archaeological Items

Should unanticipated relics be discovered during the course of the project, work in the vicinity must cease and an archaeologist contacted to make a preliminary assessment of the find. The Heritage Council will require notification if the find is assessed as a relic. It is noted, that relics are historical archaeological resources of Local or State significance are protected in NSW under the *Heritage Act 1977* (Heritage Act). Relics cannot be disturbed except with a permit (Section 140 Application) or exception notification (Section 139).

6.17 HAZARDS AND RISK

Review of the quantities of Dangerous Goods proposed to be stored at the Site as part of the Proposed Development against *Hazardous and Offensive Development Application Guidelines Applying SEPP 33* (Department of Planning, 2011) was undertaken. This found that the SEPP 33 threshold quantities for Dangerous Goods to be stored and transported at the Site would not be exceeded. As such, SEPP 33 does not apply to the Proposed Development, and no further assessment against SEPP 33 is considered warranted (refer to **Appendix 18**).

6.18 INFRASTRUCTURE REQUIREMENTS

The *Soil and Water Management Plan & Civil Servicing Report* (at&l, 2020) considered the proposed servicing needs of the Proposed Development (refer to **Appendix 8**).

6.18.1 Water

There is no existing water supply to the Proposed Development. A new water connection would be made to the existing water infrastructure located at the intersection of Berrima Road and Taylor Avenue, approximately 400 m south of the entrance driveway into the Site. According to Council records, the existing water main in this location is a 100 mm diameter AC pipe.

Wingecarribee Shire Council engineers are currently undertaking hydraulic modelling on behalf of Austral Masonry in order to confirm the available capacity of the public water infrastructure network, proposed connection size and location.

6.18.2 Sewerage

There is no existing sewerage connection to the Site. A new pressurised sewer rising main would be installed to the existing public sewer pump station in Adelaide Street, New Berrima. The alignment would run approximately 950m along the Berrima Road and Taylor Avenue road verges at a standard cover. Sewerage from the development would be pumped along the new main by a proprietary package pump station to be installed on the Site, collecting flows from the internal sanitary drainage.

6.18.3 Electricity

There is no existing electricity connection to the Site. The Proposed Development would take a new high voltage feed off the existing electrical infrastructure at the Berrima Road / Taylor Avenue intersection, for which a new 11 kV feeder will be required from the existing Berrima Junction Zone Substation, located on Douglas Road, approximately 2 km southeast of the Subject Site. This connection is likely to involve a combination of underground ducts and overhead lines across various lengths.

6.18.4 Telecommunications

There are no existing telecommunications connections to the Site. The Proposed Development would connect into the existing Telstra and / or NBN infrastructure located in the western road verge of Berrima Road. A new joint pit is likely to be required. Further discussions would be carried out with Telstra to confirm the exact connection point during the detailed design stage.

6.18.5 Gas

There is no existing gas connection to the Site. The Proposed Development would be serviced with gas via a new medium pressure connection into the existing Jemena gas infrastructure located to the south of the Site on Berrima Road (serving the Boral Cement works). Further discussions would be carried out with Jemena to confirm the details of the network extension.

6.18.6 Access

Existing access to the Site is located off Berrima Road. An existing asphalt driveway approximately 300 m north of the Taylor Avenue intersection was constructed as part of a previous development proposal by another party, which did not proceed any further.

The Proposed Development would be accessed via the existing access points off Berrima Road. The northern access point would be upgraded to a concrete vehicle crossing in accordance with Council standards to accommodate increased truck traffic, whilst the southern access would be maintained in its current state and used for light vehicles only. Refer to **Section 6.11** and **Appendix 18** for more information.

6.19 LAND USE CONFLICTS

While the Site has most recently supported agricultural land uses, Lot 1 DP 785111 has been rezoned to IN1 General Industrial under the WLEP2010 and is mapped within an Enterprise Corridor under the MVECDCP2008. Wingecarribee Shire Council's rezoning of the Site is a direct response to the actions identified in the Regional Strategy to deliver more employment-generating lands. It is therefore understood that the remainder of Lot 1 is likely to be redeveloped for another industrial type land use in the future. Lot 1 is therefore not considered to be Important Agricultural Land as per the document *Agricultural Land Use Planning: A guideline to identifying important agricultural lands in NSW* (DPI, 2017).

As demonstrated in **Sections 6.5**, **6.7**, **6.9**, **6.11**, **6.17** and **6.18**, the Proposed Development would not result in any more than minimal, residual impacts for surrounding land users in terms of air quality, noise and vibration, erosion and sedimentation, traffic and transport, hazards and risk, and visual amenity.

At most, residual impacts related to the above matters could be considered to have a probability level of B or 'likely' under the *Land Use Conflict Risk Assessment Guide* (DPI, 2011), with consequence level of five which results in negligible impacts. As per the *Land Use Conflict Risk Assessment Guide*, this results in an overall risk rating for the Site of seven (where one is the lowest and 25 is the highest). The Proposed Development is therefore considered to be acceptable as per the *Land Use Conflict Risk Assessment Guide* criteria, with no further detailed assessment required.

Traffic generated by the Proposed Development would not impact on any existing travelling stock reserves.

The holders of nearby mining titles (Boral and Hume Coal) were consulted with as part of the preparation of this EIS. Neither party raised any concerns about future mining access issues resulting from the Proposed Development.

6.20 LANDSCAPING

Landscape Plans have been prepared by Geoscapes in support of the Proposed Development and are included as **Appendix 5**. This would include the following landscaping components:

- Existing trees (including those to be retained or removed);
- Native endemic canopy trees;
- Mix of indigenous shrub planting within structured riparian buffer;
- Existing native grassland planting mix (to be managed to 100mm high);
- Native grassland planting mix (to be managed to 100mm high);
- Basin embankment planting as per **Appendix 5** planting schedule;
- Basin floor planting as per **Appendix 5** planting schedule;
- Structured riparian buffer planting as per **Appendix 5** planting schedule;
- Open drain swale planting as per **Appendix 5** planting schedule; and
- 40m riparian corridor buffer setback.

Figure 43 provides an Overall Landscape Plan for the Proposed Development.

Figure 43 Overall Landscape Plan (Source: Geoscapes, 2020)

Figure 44, **Figure 45** and **Figure 46** provide typical cross-sections of the proposed stormwater basin, open drain swale and riparian buffer respectively.

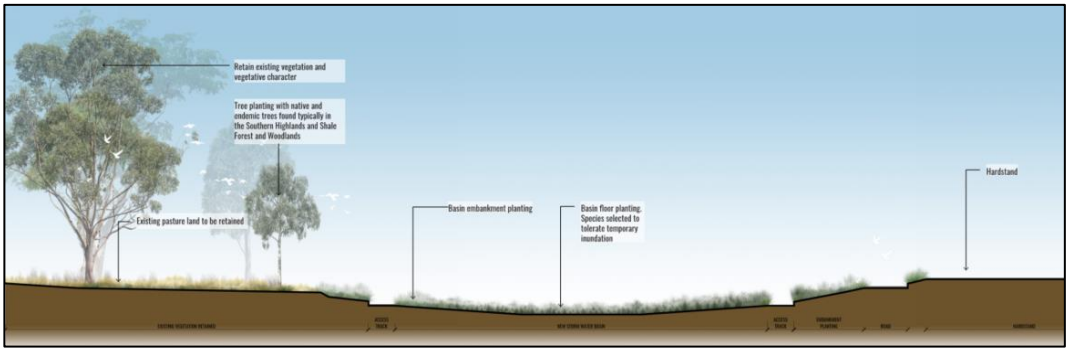

Figure 44 Typical Section Through Stormwater Basin (Source: Geoscapes, 2020)

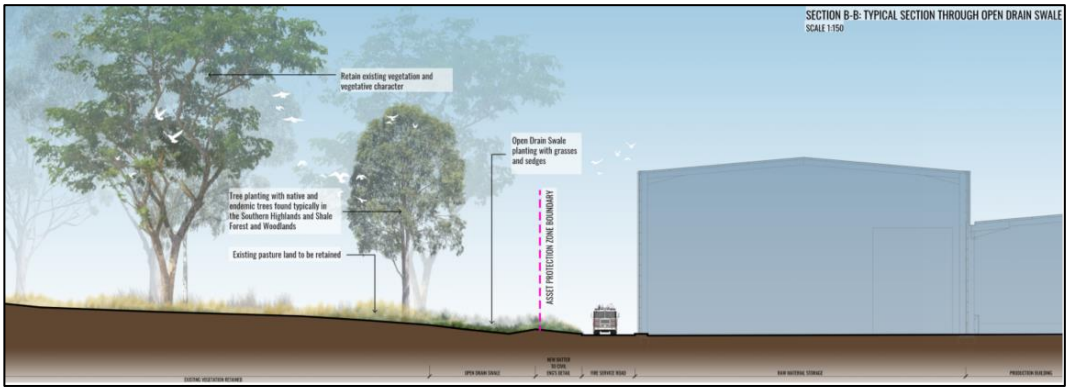

Figure 45 Typical Section Through Open Drain Swale (Source: Geoscapes, 2020)

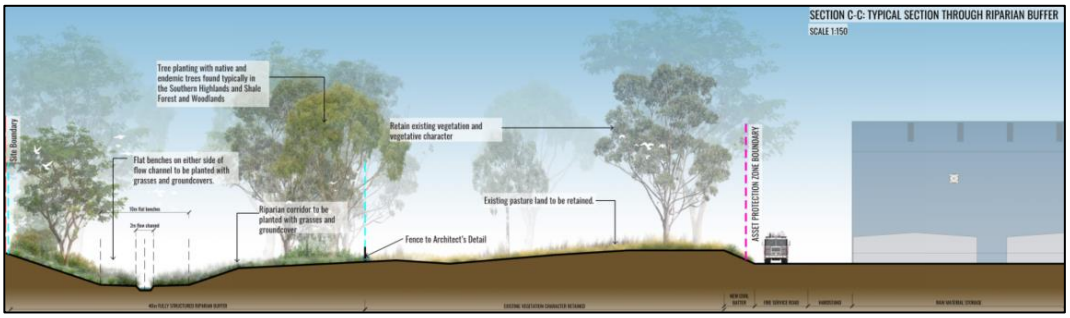

Figure 46 Typical Section Through Riparian Buffer (Source: Geoscapes, 2020)

Figure 47 below shows a cross-section of typical landscaping to be provided at the Site.

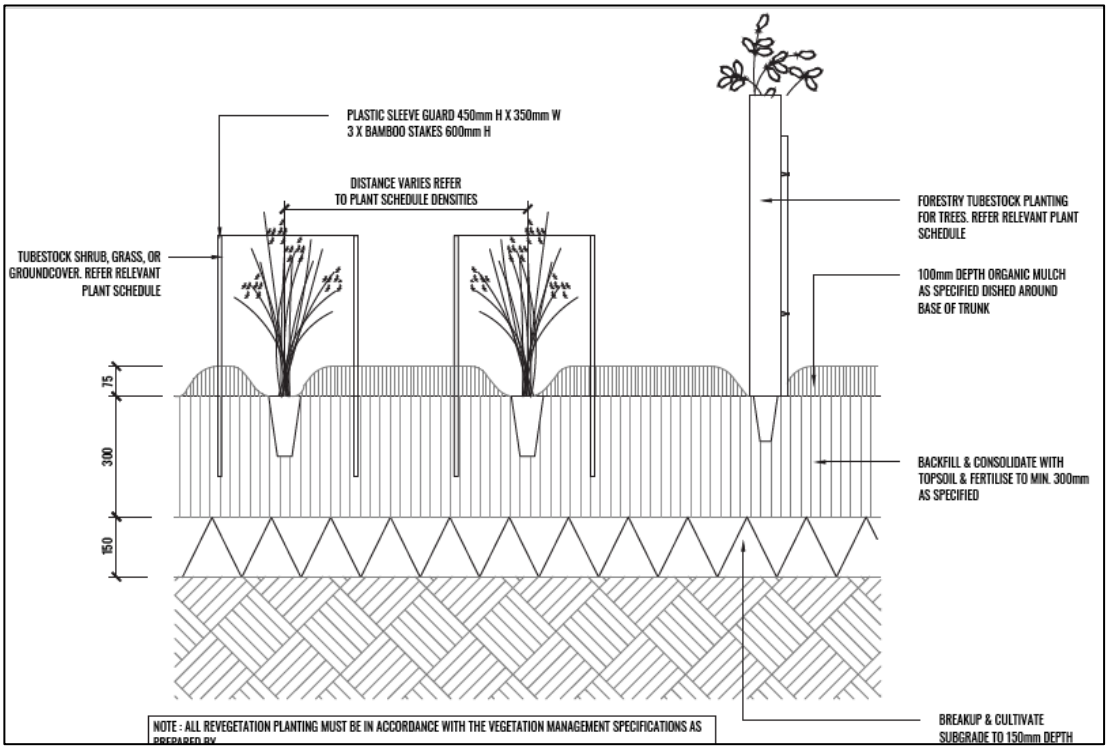

Figure 47 Typical Landscape Details (Geoscapes, 2020)

The Landscape Plans prepared in support of the Proposed Development (refer **to Appendix 19**) include the following maintenance measures which would be undertaken to ensure the ongoing quality of landscaped areas at the Site:

- General landscaping maintenance requirements:
  - Maintenance would entail the care and maintenance of the landscape works by accepted horticultural practice to rectify defects that become apparent in the landscape works under normal use; and
  - The landscape contractor would attend the Site on a weekly basis to maintain the landscape works commencing from practical completion;
- Rubbish removal:
  - The Landscape Contractor would undertake rubbish removal from the Site on a weekly basis to ensure the Site remains in tidy condition;
- Weed Eradication:
  - Weed growth that may occur in grassed, planted or mulched areas would be removed using environmentally acceptable methods i.e. non-residual glyphosate herbicide (e.g. 'Roundup', applied in accordance with the manufacturer's direction;
- Tree Replacement:

  - Trees would show signs of healthy vigorous growth and be free from disease and not exhibit signs of stress prior to handover to the client;
  - Any trees or plant that die or fail to thrive, or are damaged or stolen would be replaced;
  - Replacement material would have the initial maintenance period extended in accordance with the landscape contract conditions;
  - Trees and plant materials would be equal to the minimum requirements of species specified and approved material delivered to site; and
  - Should the condition decline from the approved sample, the Site superintendent reserves the right to reject the tree/plants;
- Stakes:
  - Adjust and/or replace stakes and ties where required; and
  - Remove staking and guying when instructed by the Site superintendent;
- Pruning:
  - Selective pruning may be required during the establishment period to promote a balanced canopy structure. These activities would be carried out to the best horticultural and industry practice. All pruned material would be removed from site;
- Mulched Surfaces:
  - All planter beds and garden areas would have a minimum depth of 75mm organic mulch. All mulch would be free of deleterious matter such as soil, weeds, sticks and should conform to *AS 4454 Composts, Soil Conditioners and Mulches*;
  - Mulched surfaces would be kept clean and tidy and free of any deleterious material and foreign matter. Depths would be reinstated to a uniform level of 75mm with mulch as specified;
  - Mulch would be free of any wood material impregnated with CCA or similar toxic treatment; and
  - Mulch levels would be topped up prior to handover to client and estate management;
- Watering:
  - An appropriate hand watering regime would be implemented in areas not irrigated in association with the current watering programme to maintain plant health and vigour. The program would reflect seasonal conditions and plant species. This would be undertaken weekly or as otherwise required;
- Soil In Natural Ground:
  - Non-Australian native garden beds would have soil installed consisting of 50% existing site topsoil and 50% new topsoil equal or equivalent to 'Organic Garden Mix' as supplied by Australian Native Landscapes; and
  - Australian native garden beds would have soil installed consisting of 50% existing site topsoil and 50% new topsoil equal or equivalent to 'Native Low 'P' Mix' as supplied by Australian Native Landscapes. Soil to conform to *AS4419 Soils for Landscaping and Garden Use*;
- Pest and Disease Control:
  - The Landscape Contractor would spray for pests and disease infestations when the pest and fungal attack has been positively identified and when their populations have increased to a point that would become detrimental to plant growth. All pesticides would be applied to manufacturer's directions during weekly inspections;
- Fertilising:
  - Checks would be undertaken for general signs of nutrient deficiencies (e.g. yellowing of leaves, failure to thrive, etc.), and fertiliser regimes would be adapted to suit; and
  - Fertiliser would be applied at the beginning and the end of the (summer) growing season;
- Standards:

- All grown or purchased plant stock would conform to all the conditions and requirements given in NATSPEC Guide: Specifying Trees;
- Soils would be in accordance with *AS4419 Soils for Landscaping and Garden Use*;
- Mulching composts and conditioners would be in accordance with *AS 4454 Composts, Soil Conditioners and Mulches*; and
- Soils would conform to best practice specifications as listed in the Landscape Soils Handbook (Simon Leake & Elke Haege 2017).

Overall, it is considered that with the proposed Landscape Plans and supporting maintenance regime in place, the Proposed Development can proceed with suitable, primarily native, landscaping to support the amenity of the Site and biodiversity of the broader locality.

6.21 ECONOMIC

*The 416 Berrima Road, New Berrima Economic Impact Assessmen*t (Macroplan, 2020) (Economic Impact Assessment) has been prepared in support of the Proposed Development and is included as **Appendix 24**.

The primary objective of the Proposed Development is to provide a new, state of the art Brickworks facility to supersede the operations of the currently outdated Bowral Brickworks Plant, allowing Brickworks Land and Development to continue to supply its premium "Bowral Blues" clay product. The existing Bowral Brickmaking Plant currently supports around 35 full time equivalent workers. It is:

- Supported by a quarry which is nearing depletion;
- Located at a distance from direct access to key logistics infrastructure (e.g. the Hume Highway);
- Accessed via a narrow road which is shared with residential land users;
- Facing an uncertain employment future;
- Located within a constrained area of Bowral, preventing future expansion at the same site; and
- Located within a residential township with a high retiree population and a focus on tourism, education and health, meaning that significant community opposition would likely be received should the current Bowral site seek an expansion DA.

In terms of employment, it is considered that the construction stage of the Proposed Development would generate 60 to 65 full-time equivalent jobs per annum directly, and a further 95 to 100 full-time equivalent jobs per annum indirectly (for example, jobs in transport, manufacturing, fabrication, design etc).

The Proposed Development would allow for a continued and expanded operational employment outcome compared to the current operation of the Bowral Brickmaking Plant. Indeed, the Proposed Development would support around 40 full time equivalent jobs, representing a 15% increase in direct employment. Additional benefits of the Proposed Development include:

- Located at a site which contains adequate room to accommodate future expansion, should this be required, whilst also reducing the potential for future land use conflicts;
- Ability to support local employment by maintaining employment/industrial land stocks and local employment objectives, whilst promoting key local industries;
- Additional employment-generation during each of the planning, construction, operation and maintenance stages; and
- Promotion of key local industries.

The Proposed Development's ability to provide economic expansion is based on the following elements:

- Direct employment within the industry creating value-added income as well as industry-specific output;
- Indirect employment outside of the industry, creating value-added income as well as encouraging other industries to generate related outputs; and
- Induced spending impacts, creating economic ripples from added consumption generated by direct and indirect employment. For example, employees spend their incomes at local supermarkets, car dealerships and hotels, and these local businesses have their own workforce which benefits.

Table 51 sets out the Proposed Development's linkages with other sectors within the Wingecarribee Shire, including the current labour input from the existing Bowral Brickmaking Plant. For instance, the Bowral Brickmaking Plant currently employs 35 staff directly. On this measure, the total impact is 68 jobs, implying a ratio of 1.94 jobs for each direct job. Therefore, the total employment multiplier is 1.94 (i.e. 100 direct jobs at the Brickmaking Plant would generate around 94 indirect and induced jobs within other sectors).

Table 51 Total Employment Generation					
Element	**Direct**	**Indirect**	**Induced**	**Total Impact**	**Ratio Total to Direct**
	Current Bowral Brickmaking Plant Operations				
Output ($'m)	18.3	3.1	6.6	28	1.53
Value Add ($'m)	5.8	1.3	3.0	10	1.74
Employment (jobs)	35	10	23	68	1.94
Element	**Proposed Development Operations**				
Output ($'m)	20.9	3.5	7.6	32.1	1.53
Value Add ($'m)	6.6	1.5	3.4	11.5	1.74
Employment (jobs)	40	12	26	78	1.94

** all figures are rounded to decimal point*

Looking at the current make-up of total impact on employment, of the 32 indirect and induced jobs created from brick making operation about one-third are indirect jobs with the remaining two-third induced jobs. The brick making operation is highly capital-intensive with most of its value-added components generated by highly skilled direct workers onsite (e.g. machine operators, and engineers). According to the Economic Impact Assessment (refer to **Appendix 24**), this sector is not heavily dependent on the supplies of other sectors/industries except for quarry mining and transportation.

It is considered that spending multipliers of the workforce would be larger factors because these highly skilled workers are also high-income earners. Through consumption of goods and services (i.e. food catering, fresh food, eateries, local services, etc.) more local jobs could be supported within Berrima and the Wingecarribee Shire more generally.

From the Government's perspective, retaining expenditure and expanding on it through population and employment growth must be facilitated within the local area. This type of worker is likely to work and live close to their place of work. The Economic Impact Assessment (refer to **Appendix 24**) considers that a large proportion of the Proposed Development's workforce would be local residents from nearby towns within the Southern

Highlands. This means they would be more likely to spend their incomes within the Wingecarribee Shire.

Overall, the Proposed Development would allow for expanded employment outcome in terms of direct jobs, meaning it can generate additional indirect jobs. Based on the multiplier assessment undertaken within the Economic Impact Assessment (refer to **Appendix 24**), it is considered that 40 full time equivalent jobs at the Site would generate 38 indirect and induced jobs outside the factory, equating to an approximate 19% increase in the indirect and induced employment currently generated by the Bowral Brickmaking Plant.

In terms of brickmaking transport costs, quarrying minerals are of relatively low unit-value compared to their transportation costs. This means that processing may need to be undertaken at the source quarry site or near to the source quarry site due to the relatively high transportation costs.

The Bowral Brickmaking Plant currently operates from a factory and a quarry co-located at 1 Kiama Street, Bowral. The Bowral Brickmaking Plant has been occupied for over 95 years, with much of the onsite equipment and kilns now old and inefficient. Its quarry is also nearing exhaustion with only three to four years of reserves remaining. The New Berrima Quarry can ensure a continued supply of shale to the Bowral Brickmaking Plant after the Bowral quarry closes in the next few years, with an annual extraction limit of 150,000 tonnes permitted.

However, without the Proposed Development, shale from the New Berrima Quarry would still need to be trucked to the Bowral Brickmaking Plant's Kiama Street location for the production of dry-pressed bricks. The Berrima Plant 2 site and the existing Bowral Brickmaking Plant are located around 17 minutes' drive from each other. However, this route includes a number of constraints to heavy vehicle movements, including a narrow road which is shared with local residents and adjoining residential lands within Bowral and Mittagong. These restrictions on road services not only hinder the efficient and timely operation of brick production itself, but also result in high transport costs when manufactured bricks are sent to market.

The Proposed Development would allow processing to be undertaken on the future quarry at Berrima. That is, from a shipping perspective, there is also a cost advantage as well as a significant amenity advantage stemming from the removal of large trucks out of residential areas. Moreover, the subject at New Berrima is more accessible to highway traffic which would effectively bring down transport cost.

In terms of job containment, it is important to consider the proportion of working residents who are employed within their LGA to the total number of working residents residing within that same LGA. A high rate of self-containment implies there are many jobs in an area which employ local people, evidencing a strong regional employment base.

Wingecarribee Shire currently achieves a healthy self-containment level of 60%, with the majority of local workers residing nearby. However, the Economic Impact Assessment also notes that around two thirds of local residents nevertheless travel to work outside of the Wingecarribee Shire.

If the relocation of the Bowral Brickmaking Plant not to proceed, the higher cost of production would place the long-term viability of the Bowral Brickmaking Plant into question. Should operations at the Bowral Brickmaking Plant fail from an economic standpoint, this could lead to the loss of around 68 indirect and direct jobs for the locality (40 full time equivalent direct jobs, 12 indirect jobs, and 26 jobs in terms of induced spending). Whilst some of these workers might find work within the same area, some of them with specialised skills would be forced to move in order to find suitable work. This would result in a lower self-containment rate for the Wingecarribee Shire, meaning the LGA

becomes less self-contained. This cost would be borne by those workers and their families, particularly if the result for them involves higher housing costs and longer commutes.

Relocation of the Berrima Brickworks Plant would result in local jobs staying within the local area. As the Bowral Brickworks Plant and the Berrima Plant 2 site are only located 17 minutes' away from each other via road travel, it would still be feasible for workers to travel to work at the new Plant 2 site. For some workers, this could mean increased work commute times, whereas for others it would decrease the work commute time. The increased job certainty provided for these workers would be a significant benefit of the Proposed Development. Moreover, the higher output volume at the Plant 2 site would mean more jobs created in shipping products to market, leading to some increase in local jobs. Overall, it is considered that the Proposed Development would directly and indirectly support around 78 jobs, representing a net increase of 10 jobs. The Proposed Development can therefore be considered to create a a superior employment outcome for the Wingecarribee Shire.

The markets for quarry products are predominantly local. As such, the costs of extraction and availability of quarry sites have important implications for local developments. For example, an increase in the costs of quarry operations will impact local construction costs. This is in contrast to precious metals, for example, for which prices are established by international markets. Were the Proposed Development not to proceed, these clay products would end up costing more to produce and transport, with higher costs being passed on to consumers and industries.

Industry Value Added (IVA) is the sum of income from labour (wages), land (rent) and capital (profit) generated by the production of economic goods and services. The Proposed Development requires investment (profit), resulting in the creation of jobs (wages) in different industries (e.g. brickmaking operation jobs located at 416 Berrima Road, New Berrima would contribute to the overarching Wingecarribee brickmaking industry's total income through wages and profit). The IVA in this case demonstrates how the Proposed Development's monetary value would contribute to the local economy. Overall, the Proposed Development is estimated to generate an industry value-added, incorporating its direct and indirect jobs generation, of more than $6 million per annum. Further matters to consider regarding the IVA of the Proposed Development include:

- Relocation the Bowral Brickworks to Berrima would increase the revenue for Wingecarribee Shire Council, as higher rates apply to industrial land. Based on a land value of $3,860,000, this would generate an estimated $58,738 per annum. In addition, the potential increase in intensity of use of the existing Bowral Brickmaking Plan for a higher order use could furthermore increase the value of that land, moreover increasing revenue for Wingecarribee Shire;
- The Proposed Development would involve the use of agricultural land, which is currently exempt from land taxes. However, once the Site is used for industrial purposes, it would generate land taxes for the NSW Government (an estimated $49,304 per annum based on land value of $3,860,000);
- The expanded operations at the Berrima site would increase operational efficiencies whilst also allowing for increased product volumes to be shipped. This would moreover marginally increase payroll tax revenues. Based on both direct and indirect jobs creation analysis, it is estimated that this would generate another $40,000 to $45,000 on top of the current tax revenues;
- Given operations at the current Bowral Brickworks Plant are due to cease, the intensity of higher order industrial land uses at the existing Bowral Brickworks Plant is likely to increase. The current operations represent a low density use of that land. With a mix of industrial and commercial uses (e.g. tourism, education and health), it is estimated that the existing Bowral Brickworks Plant site could be redeveloped so as to directly employ around 300 persons. Indirectly, this could result in an additional 150 jobs created. In aggregate this would generate $1.5 to $1.6 million in payroll revenues; and

- The employment factors which drive payroll tax revenues would also lead to increased spending, which in turn increases GST revenues. Based on the projected direct and indirect employment at Berrima, it is estimated that Austral's operations would generate another $100,000 to $120,000 in additional GST revenue for the State of NSW.

Overall, it is also important to note how the Proposed Development would change the Site from an underutilised, surplus rural landholding to a productive and employment-generating industrial operation. This would allow the Site to meet its strategic potential as a mapped Enterprise Corridor under the MVECDCP2008. Furthermore, the construction and operation of the Proposed Development can take place without causing undue impacts for the surrounding locality, as set out in more detail within **Part F** of the EIS.

6.22 SOCIAL

The *Social Impact Assessment* (SIA) prepared by HillPDA (2020) considers the social impacts anticipated as a result of the Proposed Development, for the purposes of a Brick Manufacturing Facility (refer to **Appendix 25**). A "Social Impact" may be defined as the net effect of an activity on a community and the well-being of individuals and families.

The SIA provides and evaluates potential changes to existing social conditions, due to the Proposed Development. This included the assessment of direct and indirect benefits and impacts, as well as consideration of any cumulative impacts.

Potential social impacts estimated to arise from the Proposed Development are likely to be influenced by the Site's current surroundings; the eventual outcomes created by the Proposed Development; and those measures agreed to be put in place to mitigate against any negative impacts. Issues have been assessed based on their impact during the construction and operational phases of the Proposal. Social impacts can involve changes to the following nine (9) factors:

1. Way of life;
2. Community;
3. Access to and use of infrastructure, services and facilities;
4. Culture;
5. Health and wellbeing;
6. Surroundings;
7. Personal and property rights;
8. Decision making systems; and
9. Fears and aspirations.

Table 52 outlined below provides an assessment of the social risk of each social impact expected to result from the Proposal.

Table 52: Significance of Social Impacts						
Impact Theme	**Impact Detail**	**Stakeholders Impacted**	**Likelihood**	**Consequence**	**Significance**	**Mitigation Measure**
Amenity	Acoustic	Surrounding residents, businesses, sports ground users	Unlikely	Minimal		▪ None required, but proactive mitigation measures specified in the Noise and Vibration Impact Assessment are recommended to be implemented.
	Visual	Surrounding residents and businesses	Rare	Minimal		▪ Consider producing a light spill plan to show impact of lighting during evening operations.
	Odour	Surrounding residents and businesses	Unlikely	Minimal		▪ Adopting best practice measures to minimise HF emissions from the kiln. ▪ Commissioning of a new kiln which will relatively improve fuel consumption and emissions profile. ▪ Maintaining a design stack height of 35 m, which will aid pollutant dispersion. ▪ Use of raw material stockpile and crusher enclosures and providing sealed haulage surfaces.
Access	Road networks	Local residents, businesses and road users	Unlikely	Minor		▪ Upgrades to the intersections of Berrima Road / Taylor Avenue and the heavy vehicle access to the recommended Standards.
Built Environment	Public domain	Local residents	Rare	Minor		N/A
Heritage	N/A	Local residents, local Aboriginal residents and groups, individuals with other cultural or heritage links to area	Unlikely	N/A	N/A	▪ Protection and management of nearby cultural sites identified in the Archaeological Report and corresponding Aboriginal Cultural Heritage Assessment Report (ACHAR). ▪ Consultation with Registered Aboriginal Parties (RAPs) contacted as part of the assessment to be continued throughout the life of the project.

						▪ Implementation of unexpected finds protocol. ▪ Inclusion of measures taken in overall communication plan.
Community	Health	Surrounding residents and businesses, workers.	Unlikely	Moderate	Moderate	Ongoing management of potentially hazardous materials to eliminate risk of community exposure.
	Services and facilities	Surrounding residents.	Unlikely	Minor	Low	Ongoing dialogue with service providers concerning any planned workforce changes.
	Cohesion, capital and resilience	Wider community	Unlikely	Minor – positive	Moderate – positive	N/A
Economic	Livelihood	Wider community	Likely	Major – positive	High – positive	N/A
Personal and property rights	Opportunity cost	Wider community	Unlikely	Moderate – positive	Moderate – positive	N/A

HillPDA (2020) note, that whilst the Proposal carries some risks associated with impacts to local amenity via introduction of the Proposed, it is concluded that these risks can be effectively managed through proper planning and continuing engagement with surrounding community members, groups and business. Accordingly, the Proposal can deliver the benefits of the continued operation of brickmaking in the area, as well as the economic benefits through expanded operations afforded by the Proposal.

Notwithstanding, the negative impacts of the Proposed Development can be successfully managed with the implementation of the above mitigation measures. As such, it is anticipated, that the Proposed Development presents a low social risk, accompanied by significant economic benefits arising from additional employment (direct and indirect) during both the construction and operational phases of development.

The complete SIA is located in **Appendix 25** of this EIS.

6.23 GREENHOUSE GAS

In the *Proposed New Brick Factory (SSD 10422) – 416 & 524 Berrima Road, Moss Vale NSW 2577: Air Quality Impact Assessment* (Airlabs, 2020), Greenhouse Gas Emissions anticipated as a result of the Proposed Development are assessed and considered further (refer to **Appendix 13**).

Accordingly, determination of Greenhouse Gas (GHG) emissions has been undertaken in accordance with the following documentation:

- The World Resources Institute / World Business Council for Sustainable Development (WRI/WBCSD) The Greenhouse Gas Protocol – A Corporate Accounting and Reporting Standard Revised Edition (WRI/WBSCD, 2004) (hereafter 'the GHG protocol').
- National Greenhouse Account Factors August 2019, Department of the Environment and Energy, (hereafter 'NGAF 2019').
- State and Territory Greenhouse Gas Inventories 2017, Australia's National Greenhouse Accounts, Department of the Environment and Energy, June 2019 (hereafter 'the 2017 State and Territory Inventory').

NGAF 2019 defines three (3) scopes for different emission categories based on whether the emissions generated are 'direct' or 'indirect' emissions. The scopes of emissions are defined for GHG reporting as follows:

- Scope 1, which covers direct emissions from sources within the boundary of an organisation, such as fuel use, energy use, manufacturing process activity, mining activity, on-site waste disposal etc.
- Scope 2, which covers indirect emissions from the consumption of purchased electricity, steam or heat produced by another organisation.
- Scope 3, which includes all other indirect emissions that are a consequence of an organisation's activities but are not from sources owned or controlled by the organisation.

It is noted, that Scopes 1 and 2 GHG emissions from the Proposed Development have been quantified for the following:

- Combustion of natural gas for kiln operations – Scope 1 emissions;
- Diesel oil combustion for operational activities – Scope 1 emissions; and
- On-site consumption of electricity – Scope 2 emissions.

Estimates for the abovementioned criteria out demonstrated in **Table 53** below.

Table 53: Estimates of Fuel and Electricity Consumption at the Bowral Bricks Facility			
Parameter	**Value**	**Units**	**Reference**
Diesel Fuel	145.9	kL / annum	Estimated from the upgraded Plant 2 Facility at Horsley Park, NSW.
Natural Gas	376,200	GJ / annum	Site-specific value.
Electricity Usage	4176.3	MWh / annum	Estimated from the upgraded Plant 2 Facility at Horsley Park, NSW.

Accordingly, estimated Scope 1 and 2 GHG emissions, expressed in tonnes of $CO_{2\text{-}e}$ (t $CO_{2\text{-}e}$ / annum) are outlined in **Table 54** below.

Table 54: Annual Scope 1 and 2 GHG Emissions for the Bowral Bricks Facility		
Scope	**Annual Emissions (t $CO_{2\text{-}e}$ / annum)**	**Source of Emissions**
Scope 1 GHG Emissions	19,730.2	Diesel fuel and natural gas consumption.
Scope 2 GHG Emissions	3,508.1	Electricity consumption.
Total Scope 1 and 2 GHG Emissions	23.238.3	All sources.

The total estimated annual operational GHG emissions from the Proposed Development are expected to be approximately 23,238.3 tonnes of Carbon Dioxide (CO2-e). Additionally, the most recent annual GHG emissions have been obtained for both NSW and Australia (2017). According to the estimates presented in 2017 for State and Territory inventory data, the annual GHG emission for NSW and Australia were 131.5 Mt $CO_{2\text{-}e}$ and 532.8 Mt $CO_{2\text{-}e}$. The Proposed Development annual emissions contribute to approximately 0.02% and 0.004% of the State and National GHG emissions respectively.

Notwithstanding, Airlabs (2020) conclude with the following recommendations to further minimise the Proposal's GHG emission footprint:

- Ensuring proper maintenance and management of stationary and mobile equipment to improve fuel efficiency, which will result in lower fuel consumption.
- Periodic review and implementation energy efficient measures to minimise electricity consumption.

6.24 BUILDING CODE OF AUSTRALIA & FIRE ENGINEERING

As demonstrated within the *BCA Assessment Report: Proposed Brickworks Plant – 416 Berrima Road, Moss Vale* (Blackett Maguire + Goldsmith, 2020), the proposed Brickworks Plant must be designed to comply with the BCA (refer to **Appendix 27**). The detailed design of the proposed Brickworks Plant would be in accordance with the BCA and would be further assessed prior to the issue a Construction Certificate.

The assessment undertaken of the design documentation has revealed that the following areas are required to be assessed against the relevant performance requirements of the BCA (refer to **Table 55** below). The submission for Construction Certificate will need to include verification from a suitably accredited Fire Engineer.

Table 55: Relevant Performance Requirements of the BCA – Fire Safety Items	
Statutory Fire Safety Measure	**Design / Installation Standard**
Alarm Signalling Equipment	AS 1670.3 – 2004
Automatic Fail-Safe Devices	BCA Clause D2.21
Automatic Smoke Detection System	BCA Spec. E2.2a & AS 1668.1 – 2015
Automatic Fire Suppression Systems	BCA Spec. E1.5 & AS 2118.1 – 2017

Building Occupant Warning System activated by the Sprinkler System	BCA Spec. E1.5, Clause 8 and / or Clause 3.22 of AS 1670.1 – 2015
Emergency Lighting	BCA Clause E4.4 & AS 2293.1 – 2005
Exit Signs	BCA Clauses E4.5, E4.6 & E4.8; and AS 2293.1 – 2005
Fire Control Centre	BCA Spec E1.8
Fire Doors	BCA Clause C2.12, C2.13 and AS 1905.1 – 2015 and manufacturer's specification
Fire Hose Reels	BCA Clause E1.4 & AS 2441 – 2005
Fire Hydrant Systems	Clause E1.3 & AS 2419.1 – 2005
Fire Seals	BCA Clause C3.15, AS 1530.4 – 2014 & AS 4072.1 – 2005 and manufacturer's specification
Lightweight Construction	BCA Clause C1.8 & AS 1530.3 – 1999 and manufacturer's specification
Mechanical Air Handling Systems	BCA Clause E2.2, AS/NZS 1668.1 – 2015 & AS 1668.2 – 2012
Paths of Travel	EP&A Regulation Clause 186
Perimeter Vehicular Access	BCA Clause C2.4
Portable Fire Extinguishers	BCA Clause E1.6 & AS 2444 – 2001
Smoke Hazard Management Systems (Automatic Smoke Exhaust System)	BCA Part E2 & AS/NZS 1668.1–2015
Warning & Operational Signs	Section 183 of the EP&A Regulation 2000, AS 1905.1 – 2015, BCA Clause D3.6

Blackett Maguire + Goldsmith confirm that the Proposed Development can readily achieve compliance with the relevant provisions of the BCA.

Additionally, the *Fire Engineering Strategy* (Core Engineering, 2020) outlines the following with respect to the matters outlined above in **Table 56**.

Table 56: Fire Safety Systems

Fire Safety Measure	DtS Requirement	Proposed Design / Performance Solution
Fire Hydrants	AS2419.1:2005	Installation to include ring main. Where internal hydrants are required, FRNSW progressive coverage required (50m / 25m) to be incorporated
Fire Hose Reels – FRHs not required in Class 5 Office	AS2441:2005	To be provided as per DtS requirements
Fire Sprinklers	E1.5, AS2118.1:2017	No sprinklers (Performance Solution)
Portable Fire Extinguishers	AS2444:2001	To be provided as per DtS requirements
Smoke Hazard Management	Specification E2.2b	No exhaust (Performance Solution)
Fire Control Centre	E1.8, FCC required as floor area >18, 000 m^2	FIP at office main entrance, AS1670.1:2018
Fire Detection	Spec E2.2a, AS1670.1:2018	▪ Linear heat detection cable throughout Production Building(Section

		4.2 of AS1670.1:2018) ▪ Smoke detectors shall be provided to the Office ▪ Manual Call Points shall be provided at major exits and production control locations (TBC)
Building Occupant Warning System, Activated by the Fire Sprinkler System	BCA spec E1.5 and Clause 3.22 AS1670.1:2018	To be provided.
Exit Signage	AS2293.1:2018	To be provided.
Emergency Lighting	AS2293.1:2018	To be provided.

The complete Fire Engineering Strategy is located in **Appendix 28** of this EIS.

PART G PROPOSED DEVELOPMENT JUSTIFICATION

7.1 JUSTIFICATION

Overall, the Proposed Development is justified on the basis that it can support local employment by maintaining employment/industrial land stocks and local employment objectives, whilst promoting key local industries, and also generating more employment during the planning, construction, operation and maintenance stages.

The Proposed Development would furthermore change the Site from an underutilised, surplus rural landholding to a productive and employment-generating industrial operation. The Proposed Development is moreover justified in the context of environmental, social and economic terms. Furthermore, it is compatible with the locality in which it is proposed.

This EIS is lodged on the basis of the following.

7.1.1 Supporting State, Regional and Local Planning Objectives

The Proposed Development is consistent with the objectives, provisions and strategies outlined within the Regional Strategy, the Regional Plan, and the MVECDCP 2008.

Specifically, the Proposed Development would contribute to economic growth and prosperity. The Proposed Development would respond to the strategic zoning of the Site in order to support employment-generating activities which are now permitted at the Site as per Wingecarribee Shire Council's strategic vision under the MVECDCP2008.

In terms of the Regional Strategy, the Proposed Development is aligned with the specific Aims of ensuring adequate land is supplied for job creation, not cause land use conflicts with surrounding agricultural and biodiversity lands, and consider Aboriginal cultural and community values in the management of lands.

Consistent with the Directions in the Regional Plan, the Proposed Development would furthermore leverage growth opportunities from Western Sydney, secure water resources, and appropriately manage heritage items.

For the reasons outlined above, the Proposed Development is considered to positively contribute to the attainment of State, regional and local planning objectives.

7.1.2 Appropriate Use of an Approved Site

The Proposed Development would retain and contribute to the growth of manufacturing, which is an important industry for the region. The strengthening of this sector is important strategy for the economic welfare of Wingecarribee Shire's LGA as well as NSW. The Proposed Development complements significant government investment in infrastructure and strategic planning vision as enunciated in the Regional Strategy and would be a direct response to the strategic vision for the Site as set out in the Regional Strategy.

7.1.3 Environmental Impacts have been Minimised

Specialist consultants have assessed the risks and determined that the Proposed Development can be undertaken with minimal environmental impacts. No significant risks to the locality would result from the Proposed Development. Where impacts have been identified, these would be appropriately managed and mitigated through the compilation of mitigation measures.

7.1.4 Compatibility with Surrounding Development

The Proposed Development is compatible with the changing nature of this previous agricultural locality which has now been strategically rezoned by Wingecarribee Shire Council to create an Enterprise Corridor supporting employment-generating land uses. This

EIS concludes that no significant cumulative air quality, traffic or noise impacts would occur as a result of the Proposed Development.

7.1.5 Ecologically Sustainable Development

The principles of ecologically sustainable development as outlined in Clause 7(4) of the EPA Regulation are addressed as follows:

- *Precautionary Principle*
  No unmanageable threat or irreversible damage to the environment has been identified in relation to the Proposed Development. Key risks stemming from the Proposed Development have been identified, along with appropriate mitigation measures to ensure irreversible environmental damage does not occur.

- *Inter-generational Equity*
  No unreasonable use of resources, affectation of environmental processes or prevention of the use of land for future generations would occur from the Proposed Development. The Proposed Development would contribute to inter-generational equity by minimizing the consumption of resources whilst providing an upgraded built environment that will ensure the health and well-being of occupants into the future. The dedicated Safety, Health and Environment Management System aims to ensure both the design and operational process of the Proposed Development reduce its overall impact and resource use, whilst also ensuring the immediate ecological values of the Site are preserved for future generations.

- *Conservation of Biological Diversity and Ecological Integrity*
  The Ecological Impact Assessment demonstrates how the Proposed Development would not significantly impact on species or ecological communities within the locality.

- *Improved Valuation, Pricing and Incentive Mechanisms*
  The Proposed Development seeks to implement measures to avoid, contain and address any associated air quality impacts, noise impacts, waste or other forms of pollution through appropriate design and management.

  The Proposed Development would effectively enable improved cost efficiencies in the manufacturing of locally sourced clay products.

PART H SUMMARY OF MITIGATION MEASURES

The Proposed Development is SSD for which an EPL is required to be issued from the NSW EPA.

By:	Brickworks Land and Development
In relation to:	Construction and operation of a 50 million brick per annum brickworks plant with 24-7 operations as State Significant Development.
Site:	416 and 524 Berrima Road, Moss Vale (Lot 1 DP 785111 and Lot 1 DP 414246)

Brickworks Land and Development would undertake the facilitated construction and operation of the proposed Brick Manufacturing Facility in accordance with the following:

Below prescribes some of the terms and abbreviations used in this Statement, including:

Approval	The Minister's approval of the Proposed Development
BCA	Building Code of Australia
Brickworks	Brickworks Land and Development
Council	Wingecarribee Shire Council
Department	Department of Planning, Industry and Environment
EIS	Environmental Impact Statement
EP&A Act	*Environmental Planning and Assessment Act 1979*
Project	The Proposed Development as described in this EIS
Secretary General	Secretary General of the Department (or delegate)
Site / Subject Site	Land to which the project application applies
WorkCover	NSW WorkCover

ADMINISTRATIVE COMMITMENTS

Commitment to Minimise Harm to the Environment

1. Brickworks would implement all reasonable and feasible measures to prevent and / or minimise any harm to the environment that may result from the construction or operation of the project.

Occupation Certificate

2. Brickworks would ensure a staged Interim and Final Occupation Certificate is obtained prior to the occupation of the facilities.

Terms of Approval

3. Brickworks would carry out the Project generally in accordance with the:

   (a) Environmental Impact Statement.
   (b) Drawings prepared by SBA Architects (2020).
   (c) Drawings prepared by Geoscapes (2020).
   (d) Drawings prepared by at&l (2020).
   (e) Management and Mitigation Measures.
   (f) Any Conditions of Approval.

4. If there is any inconsistency between the above, the Conditions of Approval shall prevail to the extent of the inconsistency.
5. Brickworks would ensure compliance with any reasonable requirements of the Secretary-General of the Department of Planning, Industry and Environment arising from the Department's assessment of:
   (a) Any reports, plans, programs, strategies or correspondence that are submitted in accordance with this Approval; and

(b) The implementation of any recommended actions or measures contained in reports, plans, programs, strategies or correspondence submitted by the Project Team as part of the application for Approval.

Structural Adequacy

6. Brickworks would ensure that all new buildings and structures on the Site are constructed in accordance with the relevant requirements of the BCA.

Operation of Plant and Equipment

7. Brickworks would ensure that all plant and equipment used on the Site is maintained and operated in proper and efficient manner, and in accordance with relevant Australian Standards.

Construction Traffic Management Plan

8. Brickworks would ensure a Construction Traffic Management Plan is prepared and submitted to DPIE. This plan would:

   (a) be submitted to the Secretary-General for approval prior to the commencement of construction;
   (b) describe the traffic volumes and movements to occur during construction;
   (c) detail proposed measures to minimise the impact of construction traffic on the surrounding network, including driver behaviour and vehicle maintenance; and,
   (d) detail the procedures to be implemented in the event of a complaint from the public regarding construction traffic.

Contractors Environmental Management Plan

9. Prior to the commencement of construction, a Contractors Environmental Management Plan (CEMP) would be prepared that addresses the following:
   (a) Land Contamination;
   (b) Air Quality;
   (c) Waste Classification;
   (d) Erosion and Sediment Control; and,

Monitoring of State of Roadways

10. The Applicant should monitor the state of roadways leading to and from the Site and should take all necessary steps to clean up any adversely impacted road pavements as directed by Council.

Waste Receipts

11. A permanent record of receipts for the removal of both liquid and solid waste from the Site should be kept and maintained up to date at all times. Such record is to be made available to authorised person upon request.

SPECIFIC ENVIRONMENTAL COMMITMENTS

The following mitigation measures would be implemented to ensure there are no significant environmental impacts resulting from the Proposed Development.

Air Quality

12. The following mitigation measures are outlined in **Table 57** below to minimise dust emissions during construction activities.

Table 57: Construction Dust Mitigation Measures		
Source of Dust	**Mitigation Measure**	**Timing**
General	Identify dust-generating activities and inform site personnel about location.	Throughout Construction
	Identify adverse weather conditions (dry and high wind blowing from dust source to sensitive receptors) and halt dust emitting activities if visible dust impacts are identified at sensitive receptors.	Throughout Construction
Handling of Spoil and Structural Fill Material	Minimise drop height for material handling equipment.	Throughout Construction
Wind Generated Dust from Temporary Stockpiles and Exposed Areas	Apply watering through water trucks or sprinklers.	As Required
	Progressive staging of dust generating activities throughout the day to avoid concurrent dust emissions.	Throughout Construction
	Minimise exposed area if possible.	Throughout Construction
	Minimise amount of temporary material stockpiled if possible.	Throughout Construction
Wheel Generated Dust During Hauling	Restrict vehicle movement to haul routes that are watered regularly.	Throughout Construction
	Cleaning of haul roads.	As Required
	Speed restrictions.	Throughout Construction

Biodiversity

13. The following mitigation measures are recommended to protect biodiversity adjacent to impact areas during construction. In determining the location of the Proposed Development, the design has sought to minimise direct impacts on native vegetation and habitat by:

- Locating the development footprint primarily in areas comprising cleared land, exotic vegetation and planted vegetation;
- Locating the stormwater basin and drainage corridor primarily within exotic vegetation;
- Locating the development footprint in areas that will impact only on the peripherals of scattered patches of native vegetation, comprising PCT 944 and PCT 731 (or planted native trees assigned to this PCT);
- Largely avoiding areas of native vegetation located between the brick factory and the drainage corridor;
- Locating the development footprint outside of Stony Creek;
- Maintaining the drainage design of the existing overland flow characteristics and hydrology to Stony Creek;
- Retaining areas of native vegetation, comprising PCT 944;
- Situating the development footprint to remove the minimal number of trees of the threatened species *Eucalyptus macarthurii* (Camden Woollybutt) possible;
- Avoiding the use of bulk earthworks across the Study Area and limiting the width of batters so as to retain areas of native vegetation; and

- Maintaining stepping-stone habitat within the rural landscape through the retention of trees across the Study Area that primarily comprise the EEC Southern Highlands Shale Woodland consisting nearly entirely of the threatened *Eucalyptus macarthurii* (Camden Woollybutt).

Noise

14. Construction works are proposed to be undertaken during standard construction hours as follows:

- Monday to Friday, 7am to 6pm;
- Saturday 8am to 1pm; and
- No work on Sundays or public holidays.

15. While the operation of the Proposed Development is expected to comply with the relevant noise criteria for nearby sensitive receptors, the following management measures are recommended to mitigate any residual noise impacts:

- Prohibition of extended periods of on-site revving/idling;
- Minimisation of the use of truck exhaust brakes on-site;
- Enforcement of low on-site speed limits;
- Signs to encourage quiet operations during the night period; and
- On-site mobile equipment to be maintained in accordance with a preventative maintenance program to ensure optimum performance and early detection of wearing or noisy components; and
- Replacement of beeping reversing alarms on all vehicles which are regularly used on site (the forklift and front-end loader) with reversing lights or a white noise reversing alarm (squawker).

Bushfire

16.

- At the commencement of building works and in perpetuity, an APZ would be established and maintained as per **Figure 35** above. The APZ would be established and maintained as an inner protection area as outlined within PBP 2019 and the NSW RFS document '*Standards for Asset Protection Zones*;'
- Fire hydrants would be provided in accordance with Building Code of Australia E1.3, *AS2419.1:2005 Fire Hydrant Installations*, including the ring main requirements for large isolated buildings; and
- A static water supply for firefighting purposes would be provided, including a connection for firefighting purposes that provides a 65mm Storz outlet with a ball valve fitted to the outlet.

Erosion and Sediment Control Measures

17. Pre-construction erosion and sediment control measures would include:

- The civil contractor would prepare a traffic management plan for the Site which ensures efficient vehicle movement whilst minimising potential for sediment generation. This is to include designation and marking of transport routes across undisturbed portions of the Site to ensure minimal vegetation disturbance;
- Transport routes would be provided with stabilised construction entry/exits (i.e. Blue Book detail SD6-14) at the designated access points, including traffic rumble grids and washdown areas, to prevent vehicles carrying soils beyond the Site;
- Installation of a temporary sediment basin would occur before bulk earthworks across the Site begin so that sediment-laden runoff from the works can be captured and treated. This would logically be located in the same position as the future stormwater detention basin. All temporary sediment basins (including overflow

weirs) would be located clear of the 100yr ARI flood event from the Stony Creek riparian corridor;
- Diversion of "clean" water from upstream catchments away from proposed areas of disturbance and discharge via suitable scour protection; and
- All site personnel are to complete an environmental induction covering the operation and maintenance of the erosion and sediment controls.

18. Construction phase erosion and sediment control measures would include:

- Sediment fences (i.e. Blue Book detail SD6-8) to be erected to filter and retain sediments at source. In particular around the base of all soil stockpiles and at the base of the perimeter batter to prevent sediment-laden stormwater from flowing into the Stony Creek riparian zone;
- Regular dust suppression on exposed areas by water truck or use of chemical dust suppressant;
- Rapid stabilisation of disturbed and exposed ground surfaces with hydro seeding in areas where imminent construction and building works are not proposed;
- Diversion of sediment-laden water into temporary sediment control basins for settling and flocculation (if required), including provision of catch drains which may need to be moved/altered numerous times to suit construction sequencing;
- Regular inspections as soon as practicable after storm events to check and maintain controls;
- Sediment to be removed from fences when controls are 40% full and at the completion of construction. All material to be re-used or stored on-site in a controlled manner or taken off-site for re-use or disposal at a licensed waste disposal facility;
- Filter rolls or geotextile inlet filters (e.g. Blue Book SD6-11&6-12) to be installed around all new stormwater inlet gullies;
- Monitoring of water quality to determine the effectiveness of the sediment and erosion control management practices; and
- The sediment basin would not be converted into its ultimate detention basin form until such time as all building and construction works have been completed and 90% of the Site is stabilised.

Geomorphology

19. HPG outline the following recommendations to implement to reduce any potential impacts with regard to flow exiting the proposed diversion channel:

- A flow spreading structure at least 20 m wide should be constructed at the downstream end of the proposed diversion channel. This should be designed to reduce the exiting flow concentration, making the flow wide and shallow so that it flows overland down the slope of the flood plain and down at least two (2) of the existing flood chutes.
- The east bank flood plain overland flow area downstream from the diversion channel exit should be planted with closely-spaced, low-growing native plants such as Lomandra longifolia (spiny-head mat-rush).
- The diversion channel and the area downstream from its end should be monitored by inspection for erosion and sedimentation after each high flow event.

Contamination

20. A RAP is required to manage ACM present on-site and to further mitigate any potential risks to current and future on-site and offsite receptors.

Access and Transport

21. The following mitigation measures are proposed to manage the potential for traffic impacts on the local road network during the construction phase of the Proposed Development:

(a) Traffic control between the Access Road (Berrima Road / Taylor Avenue) and the Site.
(b) Scheduling of deliveries outside of the commuter peak.
(c) Appropriate approvals for any oversized vehicle deliveries.
(d) The use of Berrima Road as the designated construction vehicle route.

Waste Management

22. Waste-type-specific reduction measures will be employed during the proposed construction stage, with the following specific procedures:

- Applying practical building designs and construction techniques;
- Appropriate sorting and segregation of demolition and construction wastes to ensure efficient recycling of wastes;
- Selecting construction materials taking into consideration to their long lifespan and potential for reuse;
- Ordering materials to size and ordering pre-cut and prefabricated materials;
- Reuse of formwork (where possible);
- Planned work staging;
- Reducing packaging waste on-site by returning packaging to suppliers where possible, purchasing in bulk, requesting cardboard or metal drums rather than plastics, requesting metal straps rather than shrink wrap and using returnable packaging such as pallets and reels;
- Careful on-site storage and source separation;
- Subcontractors informed of site waste management procedures; and
- Coordination and sequencing of various trades.

23. Waste-type-specific reduction measures will be employed during the proposed operational phase, which includes the following specific procedures:

- Provision of take back services to clients to reduce waste further along the supply chain;
- Re-work/re-packaging of products prior to local distribution to reduce waste arising;
- Review of packaging design to reduce waste but maintain 'fit for purpose';
- Investigating leased office equipment and machinery rather than purchase and disposal;
- Establish systems with in-house and with supply chain stakeholders to transport products in re-useable packaging where possible;
- Development of 'buy recycled' purchasing policy;
- Flatten or bale cardboard to reduce number of bin lifts required; and
- Providing recycling collections within each of the offices and tearooms (e.g. plastics, cans and glass).

Fire Engineering

24. A *Fire Engineering Strategy* would be prepared for the Site in accordance with the relevant performance solutions outlined in **Table 58**.

Table 58: Fire Safety Systems		
Fire Safety Measure	**DtS Requirement**	**Proposed Design / Performance Solution**
Fire Hydrants	AS2419.1:2005	Installation to include ring main. Where internal hydrants are required, FRNSW progressive coverage required (50m / 25m) to be incorporated
Fire Hose Reels – FRHs not required in Class 5 Office	AS2441:2005	To be provided as per DtS requirements
Fire Sprinklers	E1.5, AS2118.1:2017	No sprinklers (Performance Solution)
Portable Fire Extinguishers	AS2444:2001	To be provided as per DtS requirements
Smoke Hazard Management	Specification E2.2b	No exhaust (Performance Solution)
Fire Control Centre	E1.8, FCC required as floor area >18, 000 m^2	FIP at office main entrance, AS1670.1:2018
Fire Detection	Spec E2.2a, AS1670.1:2018	▪ Linear heat detection cable throughout Production Building(Section 4.2 of AS1670.1:2018) ▪ Smoke detectors shall be provided to the Office ▪ Manual Call Points shall be provided at major exits and production control locations (TBC)
Building Occupant Warning System, Activated by the Fire Sprinkler System	BCA spec E1.5 and Clause 3.22 AS1670.1:2018	To be provided.
Exit Signage	AS2293.1:2018	To be provided.
Emergency Lighting	AS2293.1:2018	To be provided.

Visual

25. Landscaping would be utilised at the Site to minimise any significant vegetation clearing which could impact on views into the Site. Where such landscaping works are undertaken, species would be selected from the Cumberland Plain Woodland EEC vegetation grouping.

Aboriginal Heritage

26.

Recommendation 1: Conservation of Part of AHIMS 52-4-0196 (Stoney Creek 1)

Stoney Creek 1 (AHIMS 52-4-0196) was relocated during the survey and the test excavations within Site 2 identified a moderate density, intact subsurface archaeological deposit within a slightly elevated terrace landform associated within the grinding grooves.

The grinding grooves and subsurface artefact scatter are outside of the Proposed Development footprint and will not be impacted. Notwithstanding, the grinding grooves should be protected with a buffer and fencing.

Recommendation 2: Aboriginal Cultural Heritage Management Plan

The current Aboriginal Cultural Heritage Management Plan (ACHMP) should be updated pursuant to consultation with the RAPs and EES to include the proposed Site 2 study area. The ACHMP will facilitate the implementation of the management and mitigation strategies for all 14 sites located within the study area by clearly outlining Aboriginal site management requirements including the management of unexpected finds.

Recommendation 3: Continued Consultation with the Registered Aboriginal Parties

The Proponent should continue to inform the RAPs about the management of Aboriginal Cultural Heritage sites within the study area throughout the life of the project. Biosis confirm that the final report will be sent to the RAPs, EES and the AHIMS Register for further review.

Historic Heritage

27.

Recommendation 1: No Further Historical Heritage Assessment Required

The assessment undertaken by Biosis has identified no items of heritage significance or archaeological potential within the study area. As such, no further historical heritage assessment is required. Should unanticipated relics be discovered during ground disturbance, an unexpected finds procedure should be implemented as outlined in Recommendation 2 below.

Recommendation 2: Unexpected Archaeological Items

Should unanticipated relics be discovered during the course of the project, work in the vicinity must cease and an archaeologist contacted to make a preliminary assessment of the find. The Heritage Council will require notification if the find is assessed as a relic. It is noted, that relics are historical archaeological resources of Local or State significance are protected in NSW under the *Heritage Act 1977* (Heritage Act). Relics cannot be disturbed except with a permit (Section 140 Application) or exception notification (Section 139).

PART I CONCLUSION

The Proposed Development is SSD for which an EPL is required to be issued from the EPA.

The Site is owned by Austral Masonry and is primarily located within the mapped Enterprise Corridor under the (MVECDCP2008). It has strategic access to the Hume Highway, and is directly connected by rail to Port Kembla.

The provisions of the WLEP 2010 permit the Proposed Development. No adverse environmental impacts are anticipated to result from the construction or operational phases of the Proposed Development given its context in the new Enterprise Corridor under the MVECDCP 2008.The Proposed Development is also suitably separated from sensitive areas and would be serviced by adequate infrastructure, including a capable road network. The inconsequential environmental impact of the Proposed Development would be ensured by the implementation of the management and mitigation measures outlined in **Part F** of this EIS formulated in response to the findings and recommendations of the specialist reports provided within **Appendix 4** to **Appendix 28**.

The Proposed Development is consistent with the objectives, provisions and strategies outlined within the Regional Strategy, the Regional Plan and the MVECDCP2008. Specifically, the Proposed Development would contribute to economic growth and prosperity in accordance with these policies by supporting private enterprise, thereby creating employment opportunities in a site earmarked for such development.

Further, the Proposed Development would respond to the strategic zoning of the Site in order to support employment-generating activities (i.e. General Industry within the IN1 General Industrial land zone). It would have significant positive economic impacts for the local and regional economies. These benefits derive from the direct employment opportunities provided through the construction and operational phases of the Proposed Development. Additionally, the Proposed Development would support indirect development and investment for the local and regional populations by providing a local source of clay products.

Based on the findings of this EIS, the Proposed Development supports continued job creation in Wingecarribee and contributes to the retention and growth of General Industry land uses. The Proposed Development is suitable for the local context and is appropriate based on social, cultural, economic and environmental considerations.

As such, it is recommended that the Proposed Development be supported by the Department of Planning, Infrastructure and Environment.

Appendix 1
Secretary's Environmental Assessment Requirements

Appendix 2
QS Report

Appendix 3
Survey Plan

Appendix 4
Architectural Plans

Appendix 5
Landscape Plans

Appendix 6
Landscape Design Report

Appendix 7
Landscape and Visual Impact Assessment

Appendix 8
Civil Engineering Report and Drawings

Appendix 9
Preliminary Site Investigation

Appendix 10
Geomorphology Report

Appendix 11
Traffic Impact Assessment

Appendix 12
Noise Impact Assessment

Appendix 13
Air Quality Impact Assessment

Appendix 14
Biodiversity Development Assessment Report

Appendix 15
Vegetation Management Plan

Appendix 16
Arborist Report

Appendix 17
Bushfire Impact Assessment

Appendix 18
SEPP 33 Report

Appendix 19
Waste Management Plan

Appendix 20
Ecologically Sustainable Development Report

Appendix 21
Statement of Heritage Impact

Appendix 22
Archaeological Report

Appendix 23
Aboriginal Cultural Heritage Assessment Report

Appendix 24
Economic Impact Assessment

Appendix 25
Social Impact Assessment

Appendix 26
Community Consultation Report

Appendix 27
BCA Report

Appendix 28
Fire Engineering Strategy

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