Development Application

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Statement of Environmental Effects

Cotton Gin Development

5387 Coonabarabran Road, Yannergee NSW 2343

Lot 1632 Deposited Plan 801779

Agri Hub Pty Ltd

15 December 2022

Document Version: 20221215AgriHubDA.odt
prepared by G J Meares
approved by J S Davies

Cover images: Truck of Cotton Modules,
Cotton Field in Liverpool Plains

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Appendices

Attachments

Abbreviations

Agri Hub	Agri Hub Pty Ltd
ADT	Average Daily Traffic
AHD	Australian Height Datum
AHIMS	Aboriginal Heritage and Information Management System
a.k.a.	Also known as
ARRB	Australian Road Research Board
BAL	Basic Left Turn
BAL-XX.x	Bushfire Attack Level – XX.x Watts per square metre rating
BAR	Basic Right Turn
BCA	Building Code of Australia
bhd	Breast height diameter
BOS	NSW Biodiversity Offset Scheme
bph	Bales per hour
CIV	Capital Investment Value
Council	Liverpool Plains Shire Council
DCP	Liverpool Plains Development Control Plan 2012 as amended 2021
DCS	NSW Department of Customer Service
DP	Deposited Plan
DPI	NSW Department of Primary Industries
EDD	Extended Design Domain
EPA	NSW Environment Protection Authority
EP&A Act	NSW Environmental Planning & Assessment Act 1979
EP&A Regulation	NSW Environmental Planning & Assessment Regulation 2021
EPBC Act	Commonwealth Environmental Protection and Biodiversity Conservation Act 1999
GDA	Geocentric Datum of Australia
GST	Goods and Services Tax
LEP	Liverpool Plains Local Environmental Plan 2011
LGA	Local Government Area
LPSC	Liverpool Plains Shire Council
MGA	Map Grid of Australia
NCC	National Construction Code
NSW	State of New South Wales
p.a.	per annum
PBP 2019	Planning for Bushfire Protection 2019
PoEO Act	Protection of the Environment Operations Act 1997
RFS	NSW Rural Fire Service
RMS	NSW Roads and Maritime Services (now TfNSW)
round	Round Cotton Module
RU1	RU1:Primary Production zoning
SEE	Statement of Environmental Effects
Sch.	Schedule of Act or Regulation
SEPP	NSW State Environmental Planning Policy
TfNSW	Transport for NSW
TSP	Total Suspended Particulates
§	section or clause

Units

dB, dB_A	decibel, decibel A weighted
dB $L_{Aeq(15\ minute)}$	sound level with the equivalent sound pressure energy to the A weighted sound pressure energy averaged over 15 minutes
ha	hectare, 10,000m^2
hr	hour
kl	kilolitre, 1,000 litres
km	kilometres, 1,000m
kph	kilometres per hour
kV	kilovolt, 1,000 volts
mg	milligrams, 0.001 grams
m	metre
m^2	square metre
m^3	cubic metre, 1,000 litres
mm	millimetres, 0.001m
t	tonne, 1,000 kilograms
vpd	vehicles per day
vph	vehicles per hour

Executive Summary

The proposed cotton gin is a very suitable development and land use for the site.
It supports the aims of the Liverpool Plains Shire.
It is economically advantageous to the community without being unacceptably intrusive or socially disruptive.

The development fufills planning requirements and is permissible with consent.
Council is the determining authority for granting consent.
Concurrence or referral to other authorities is not necessary for consent to be granted.

The project has been carefully designed to minimise environmental impacts.
No significant adverse environmental impacts have been identified.

Table 1: Summary

Property Title Reference	Lot 1632 Deposited Plan 801779
Property Address	5387 Coonabarabran Road, Yannergee, NSW 2343
LGA	Liverpool Plains
Property Area	498.7 ha
Development Site Area	approximately 50 ha
Property Owner and Proponent	Agri Hub Pty Ltd ABN 34 632 170 088
Project	Staged Cotton Gin
Scale	Not exceeding 30,000 tons per annum
Construction Cost[1]	$15.338 million
CIV[2]	$14.044 million
Proposed Land Use	*rural industry*, *agriclutural produce industry*, *cotton gin*
Type of Development	*Local* Development
Determinning Authority	Liverpool Plains Shire Council
Zoning	RU1: Primary Production
Minimum Lot Size	200 ha

1 Includes GST. Excludes project management cost.
2 Excludes GST

1 Introduction

Agri Hub Pty Ltd, the developer or proponent, proposes to build a cotton gin on part of Lot 1632 Deposited Plan 801779. The address is 5387 Coonabarabran Rd Yannergee but the project site is in the eastern side of the property, adjacent to Wandobah Road (see Figure 1).

The project is a staged development. When all stages are complete the facility will be capable of processing up to 30,000 tonnes of cotton modules per annum.

The stages of the development are:

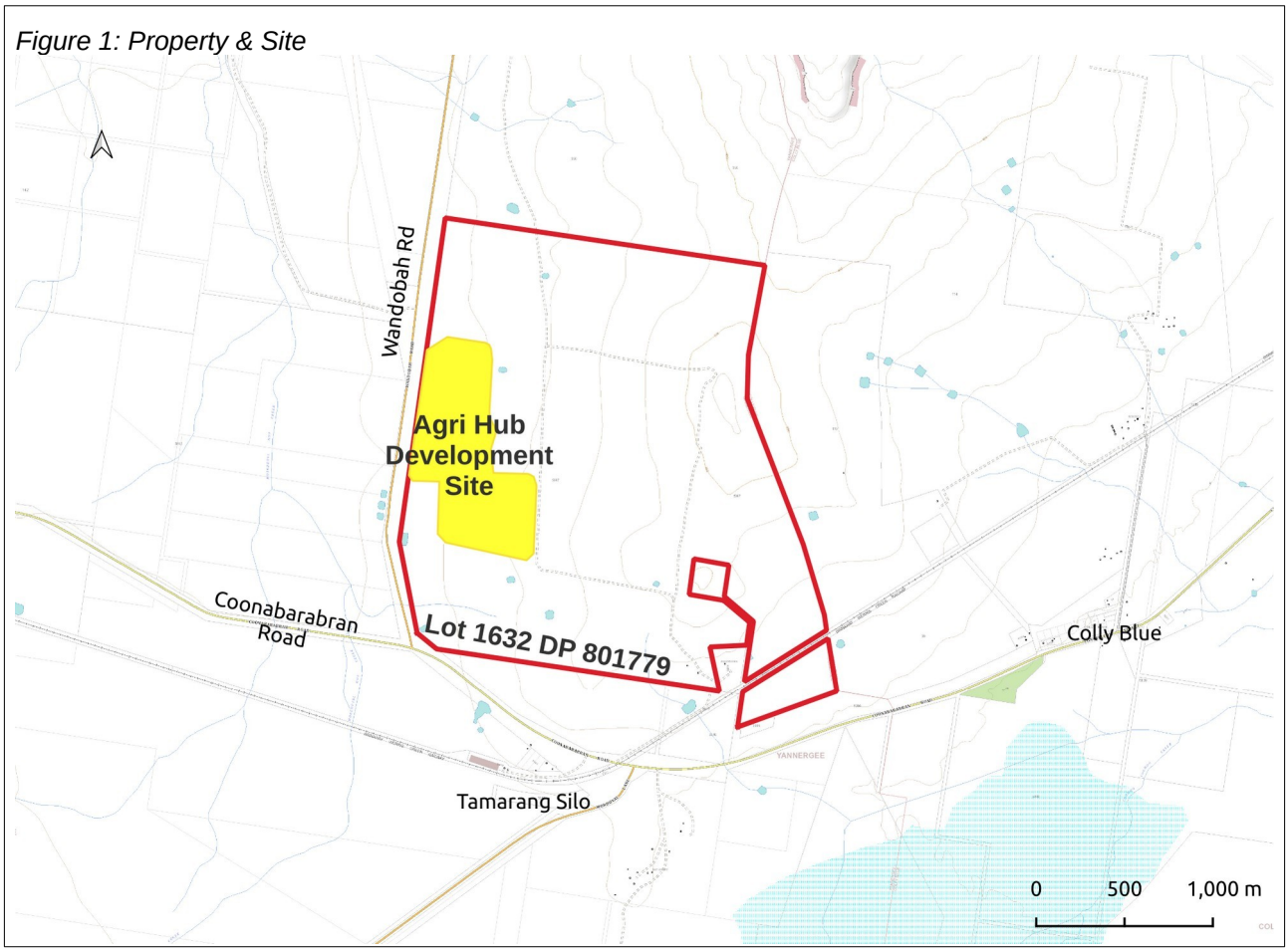
- North Module Storage stage,
- Shed stage,
- Gin stage,
- South Module Storage stage.

The sequence of the stages is in the order above, except the South Module Storage stage could be developed concurrently with, or subsequently to, the Shed or Gin stages.

This document and its attachments form the Development Application and provide the requisite information for the development's determination, including description of the project, the estimated construction cost, a Statement of Enviromental Effects (SEE), and the developer's opinions in respect of applicable regulations and planning instruments.

Mr John Scott Davies & Mrs Trudy Ann Davies own Agri Hub Pty Ltd (Agri Hub). They also own the Carroll Cotton Company Pty Ltd and manage the operations at its cotton gin.

Figure 1: Property & Site



2 Consent Pathway

Under Part 4 of the NSW Environmental Planning & Assessment Act 1979 (EP&A Act), a development subject to the Liverpool Plains Local Environmental Plan 2011 (LEP), cannot be undertaken without consent, except when the development is *Exempt* or when a *Complying development* certificate is issued. The proposed development is subject to the LEP because the property is situated within the coverage of the LEP's Land Application Map[3] [4]. The proposed development requires consent because it is not an *Exempt development*[5] or a *Complying development*[6].

Furthermore, under the EP&A Act, the consent authority is the council, unless the development is of *State significance*, is *Regionally significant*, or of a kind for which another public authority has been declared the consent authority. In the case of the proposed development, it is not of *State significance*, the *Capital Investment Value*[7] (CIV) is less than the $30 million threshold for *Regional developments*[8], and it is not of a kind for which another authority has be declared the consent authority. The development is *Local* development and Liverpool Plains Shire Council (LPSC) is the authority for determining the development application and granting consent.

The development is not a high-impact *Designated development*[9] under EP&A Act and Environmental Planning & Assessment Regulation 2021 (EP&A Regulation)[10], because it does not involve processing more than 30,000 tonnes of agricultural produce per year. The development is not an *Integrated development*[11],or a *Nominated Integrated development*[12]. No other licences or approvals are required for the development. At a scale not exceeding 30,000 tonnes per annum, an Environment Protection Authority (EPA) licence[13] is not required. No planning instruments mandate either referral to or concurrence from other authorities for Council to grant consent. The development is not a *Traffic Generating Development*[14]. The peak traffic is below the applicable threshold in the Schedule[15]. The development application does not require referral to TfNSW before determination.

The land is zoned "RU1:Primary Production"[16]. In the LEP, within zone RU1, *rural industries* are *Permitted with consent*. The definition of *rural industry*[17] includes "*agricultural produce industry".* The definition of *agricultural produce industry*[18] explicitly includes "*cotton gins".* Cotton "*module storage"* is not separately mentioned but it is an *ancillary use* and is encompassed by the definition of *"agricultural produce industry"*.

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3 §1.3 Liverpool Plains Local Environmental Plan 2011
4 Liverpool Plains Local Environmental Plan 2011 Land Application Map – Sheet LAP_001
5 §3.1 Liverpool Plains Local Environmental Plan 2011
6 §3.2 Liverpool Plains Local Environmental Plan 2011
7 Sch. 7 Environmental Planning and Assessment Regulation 2021
8 Sch.6 §2 State Environmental Planning Policy (Planning Systems) 2021
9 §4.10 NSW Environmental Planning and Assessment Act 1979
10 Part 1 §7 and Sch. 3 Part 2 Environmental Planning and Assessment Regulation 2021
11 §4.46 NSW Environmental Planning and Assessment Act 1979
12 Sch 1 §7(2) NSW Environmental Planning and Assessment Act 1979
13 Sch 1 Part 1 Protection of the Environment Operations Act 1997
14 §2.122 SEPP (Transport and Infrastructure) 2021
15 Sch.3 SEPP (Transport and Infrastructure) 2021, "Any other purpose" category
16 Liverpool Plains Local Environmental Plan 2011 Land Zoning Map – Sheet LNZ_001
17 **"rural industry** means the handling, treating, production, processing, storage or packing of animal or plant agricultural products for commercial purposes, and includes any of the following—
(a) agricultural produce industries,
(b) livestock processing industries,
(c) composting facilities and works (including the production of mushroom substrate),
(d) sawmill or log processing works,
(e) stock and sale yards,
(f) the regular servicing or repairing of plant or equipment used for the purposes of a rural enterprise.
Note— Rural industries are not a type of industry—see the definition of that term in this Dictionary."
18 ***"agricultural produce industry*** means a building or place used for the handling, treating, processing or packing, for commercial purposes, of produce from agriculture (including dairy products, seeds, fruit, vegetables or other plant material), and includes wineries, flour mills, cotton seed oil plants, cotton gins, feed mills, cheese and butter factories, and juicing or canning plants, but does not include a livestock processing industry.
Note— Agricultural produce industries are a type of rural industry—see the definition of that term in this Dictionary."

None of the aspects of the proposed development is classified as *Prohibited* under NSW legislation or regulation, or under the LEP or the Liverpool Plains Development Control Plan 2012 as amended 2021 (DCP).

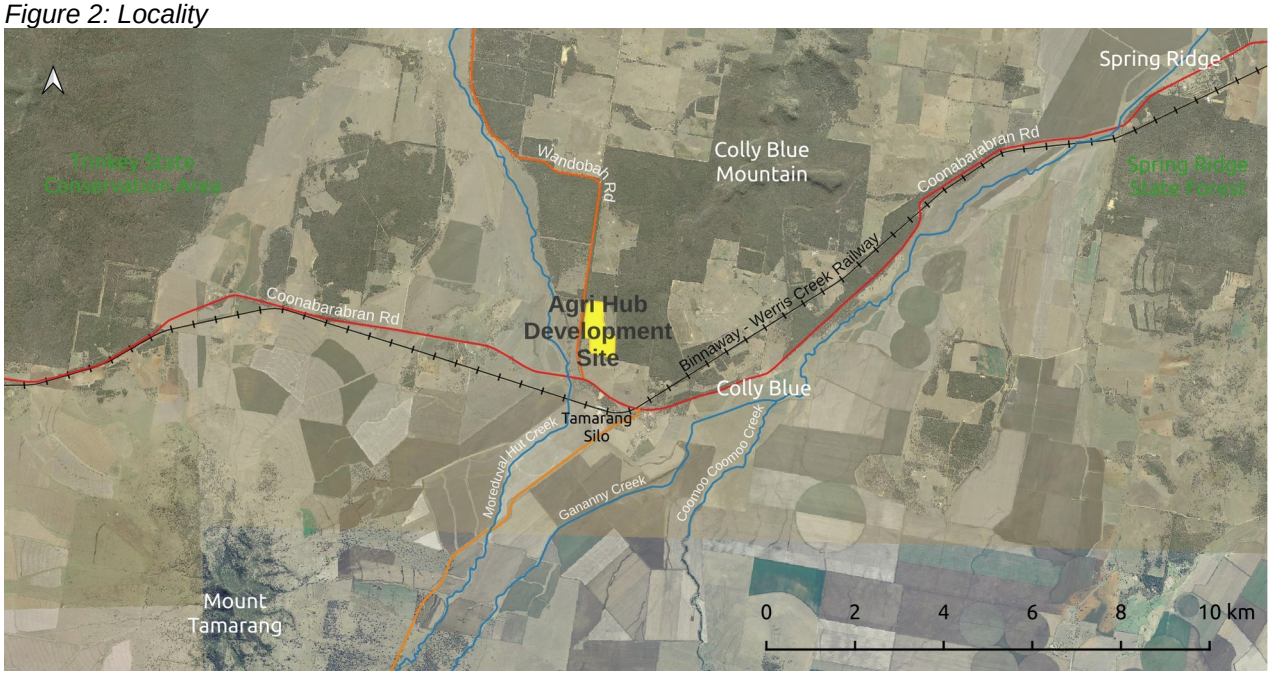
Council has discretion in relation to extent and methods of advertising and exhibition of the development application.

The proponent concludes the proposed development and its land use is permissible with consent, which may be granted by Liverpool Plains Shire Council, the determining authority.

3 Locality and Site

The property is in the open plains country of the north western part of Liverpool Plains Local Government Area (LGA). The local topology is generally fairly flat with higher ground at Colly Blue Mountain to the north east and Mount Tamarang to the south west of the subject property (see Figure 2).

Figure 2: Locality



In this vicinity most common land uses are agriculture (especially on the “black soil” flat land) and kindred activities (grazing, poultry farms, feedlot, etc). Most of the flat “black soil” country is completely cleared for broad acre cropping. The highest gound is wooded and there is vegetation along transport and riparian corridors. The Spring Ridge State Forest and Trinkey State Conservation area are nearby.

Rainfall in the area averages 624.4mm annually[19]. Drainage from most of the property, including the proposed development site, is towards Moreduval Hut Creek. Drainage from the very southern part of the property is to Gananny Creek and then to Coomoo Coomoo Creek.

The nearest village is Colly Blue, approximately 5 km to the east of the property. Premer is 19 km to the west and Bundella is 16 km southwest. All are small villages and the population in the vicinity is small[20].

There are grain receival sites and produce storage facilities nearby at Tamarang and then at Spring Ridge, Premer and Caroona. The single line Binnaway – Werris Creek railway bisects the property for about 500m

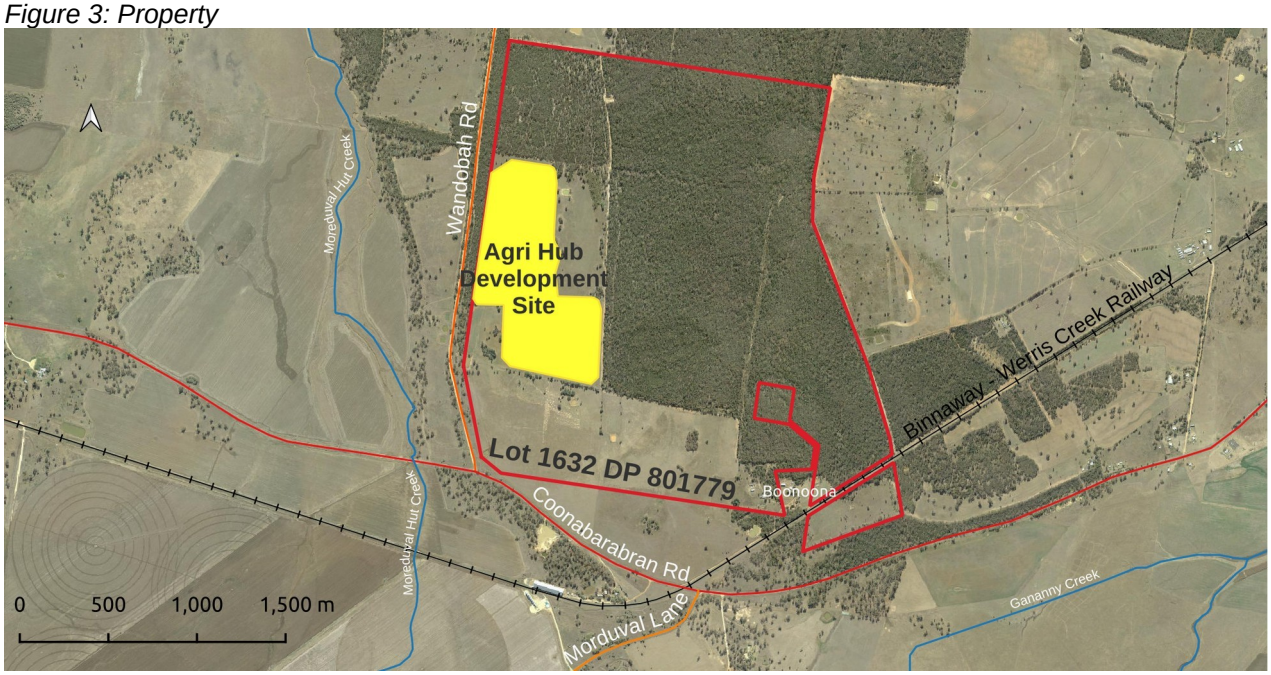
19 Bureau of Meteorology station 55069 at Dobroyd homestead 7.5km to the west of the site.
20 Census 2021 population statistics – Yannergee 29, Colly Blue 22, Premer 126, Bundella 53, Spring Ridge 266.

at the property's south eastern edge. The nearest siding is at Tamarang silo, about 1.5km down the line towards Binnaway.

There is a high voltage power line traversing from Colly Blue to Premer. It just passes the south eastern vertex of the property. There is a mobile phone tower with both Telstra and Optus 4G signals at Mount Tamarang, 10km away. The nearest CORSnet station is at Blackville, 25km away. The Central Ranges (Dubbo to Tamworth) gas pipeline runs to the within 1km south of the property. There is a fenced compound where the pipe is above ground just off Morduval Lane.

The property is near the intersection of Coonabarabran Rd and Wandobah Rd (see Figure 3). The western side of the property is adjacent to Wandobah Rd. Coonabarabran Road (a.k.a. Quirindi Premer Rd) is the *Main* arterial road running east-west through the shire from the Kamilaroi Highway through Caroona, Spring Ridge, Colly Blue, Premer and eventually leading on to Coonabarabran in Warrumbungles LGA. The side road, Wandobah Rd is a *Local* road, running north, leading into the Gunnedah LGA and eventually to Gunnedah 55km to the north. The roads are described in more detail in Appendix E – Traffic Impact Assessment.

Figure 3: Property



The property and all surrounding properties are Zoned RU1 Primary Production on the LEP's Land Zoning Map[21] and shaded to indicate the Minimum Lot Size is 200ha on the LEP's Lot Size Map[22]. The location is not shaded in the LEP's Heritage Map[23]. The property and its surroundings are not *Flood Affected Land*[24] in the DCP.

The property is 498.7ha of irregular shape with two intrusions, 4ha for Boonoona homestead and 4ha for a square shaped piece of Crown land. There is a 600m long by 20m wide Crown road to the Crown land.

The eastern and higher elevation side of the property is unimproved and wooded, except for fence and fire break lines. The wooded proportion is about 55% of the entire property. The remainder of the property is fenced grazing pasture with scattered paddock or shade trees. Improvements include fences, dams, a couple of shelters and some stockyards/pens.

21 Liverpool Plains Local Environmental Plan 2011 Land Zoning Map – Sheet LNZ_001
22 Liverpool Plains Local Environmental Plan 2011 Lot Size Map – Sheet LSZ_001
23 Liverpool Plains Local Environmental Plan 2011 Heritage Map – Sheet HER_001
24 Liverpool Plains Development Control Plan 2012 as amended 2021 Appendix A, page 55, Liverpool Plains Local Environmental Plan 2011 Flood Planning Map

Property elevations range from 356m to 406m Australian Height Datum (AHD). It is underlain with Jurassic period Piliga Quartz Sandstone at the higher levels and Purlewaugh Beds, a silty sandstone mudstone conglomerate, at the lower level[25]. In contrast, good "black soil" land in the vicinity is underlain by Liverpool Plains Alluvium. The soil is sandy with the proportion of sand increasing towards the bluffs. The soil type on the majority of the development site is Sodosols with Tenosols at the eastern edge[26]. The property is not identified as *Strategic Agricultural Land* by the DPI[26]. Nearby "black soil" land is marked as *Strategic Agricultural Land*.

The project site is approximately 50ha in cleared land in the northern most paddocks within the property. Site elevation ranges between 356-372m AHD and is above the nearby Wandobah Rd level. The site slopes, generally dipping 2% to the west.

The site is currently used for grazing cattle. It has previously been used for cropping. From inspection of historical aerial photographs (see Appendix B – Historical Aerial Photographs), it can be seen that timber had previously been completely cleared over a more extensive area than the current pasture area. There has been some regrowth. Over the whole property there is evidence that timber had been selectively harvested in the past to a greater or lesser extent.

The site for the proposed development is not conspicuous. The vegetated road reserve along Wandobah Road limits visibility from close up. It is partly visible through gaps in the trees for observers from Coonabarabran Road, about 1.2 km to the south (see section 6.8 for more on visibility).

4 Proposed Development

4.1 Suitability

The proposed development is a cotton gin with a capacity not to exceed 30,000 tonnes per annum. The purpose of the project is to establish a successful, enduring, cotton ginning business servicing the needs of local cotton growers and supplying cotton seed to nearby feedlots. The geographic location is key to fulfilling this purpose. Furthermore, the transport corridors and logistics facilities within the LGA are important for transporting the business' products. Cotton bales and any cotton seed that is surplus to the demand from local feedlots will be transported beyond the LGA.

The development supports the aims of Council in the LEP[27] -

> "...
> (c) to promote ecologically sustainable urban and rural development,
> (d) to provide a secure future for agriculture by expanding Liverpool Plains' economic base and minimising the loss or fragmentation of productive agricultural land,
> ..."

And it supports the objective for the property's RU1 zone[28] -

> "To encourage diversity in primary industry enterprises and systems appropriate for the area."

In one of Council's publications[29], the shire's Agricultural Infrastructure & Services have already been identified as suitable for a development of this nature -

> "Cotton grown in Shire generally goes to Carroll and Boggabri for ginning. Cotton seed produced from the ginning process may be returned to on-farm storage for stock feed, stored at the cotton seed storage facilities at Narrabri and transported back to the Shire as needed, or sold for domestic processing or export. With the Shire now producing in excess of 60,000 bales of cotton per annum, there may be potential to establish a cotton gin and/or a cotton seed storage facility in the Shire."

25 Geoscience NSW Tamworth 250K Geological Sheet SH 56-13
26 See Appendix A - Excerpts form Soil Type Map and SAL Map
27 §1.2(2) Liverpool Plains Local Environmental Plan 2011
28 Liverpool Plains Local Environmental Plan 2011 Land Use Table, Zone RU1 Primary Production, 1 Objective of zone, second dot point.
29 Liverpool Plains Shire Economic Development Strategy 2017-2020 (page 12)

The soil at the site is not Liverpool Plains alluvium (“black soil”) which would have a high alternative value for cropping. Cotton ginning, agricultural processing, is a very suitable use for the particular site and supports the agricultural activities in its surroundings.

4.2 Staging

The proposed development is a staged development, but not a concept development. The stages are North Module Storage stage, Shed stage, Gin stage and South Module Storage stage. The purpose of the staging is to allow construction and occupation certificates to be issued progressively for each stage.

The initial North Module Storage stage provides temporary storage of cotton modules off-farm. Modules which remain on the farm in the fields can be damaged from rain and poor drainage. Their presence in the fields inhibits farm operations on the ground they occupy. The usual reason that modules remain in the field is that there is insufficient room or capacity at gins for their immediate acceptance, especially during the peak picking period of good seasons.

Agri Hub aims to accept cotton modules into the North Module Storage Area before construction of the gin is completed. The cotton modules will be ginned when the Gin stage is completed, or transferred to another gin operated by the proponent’s owners if the Gin stage completion is delayed. This strategy reduces the project’s business risk.

The purpose of the Shed stage is to create a building which will be used for product storage (seed and cotton bales) when the entire development is completed, and which facilitates construction of the Gin stage in the meantime. The staged sequence reduces the project’s construction risk.

The South Module Storage stage augments module storage up to the project’s full 30,000 tonne capacity. It may take some time for the customer base to grow to this extent. Having a separate stage for the last of the module storage reduces the project’s business risk.

4.3 Description

For Plans and Elevations drawings see Attachment I.

4.3.1 North Module Storage stage

North Module Storage has capacity of 5,880 round modules (approximately 13,500 tonnes of seed cotton).
The physical facilities to be constructed include:

- a two lane, two way crossover from the Wandobah Road carrigeway across Council’s road reserve into the property,
- a 14.7 hectare module pad,
- 900m of formed internal roads of 10m nominal width,
- earthworks for module pad and road drainage and a 3,000m^3 sediment capture dam,
- a shipping container site hut, parking for 3 vehicles and a portaloo.

4.3.2 Shed stage

Shed has capacity of 10,000 bales of cotton or alternatively 1,250 tonnes of seed (and proportional capacities of mixed inventories of bales and seed).
The physical facilities to be constructed include:

- a 2,000m^2 clear span, skillion roof, NCC class 8 building,
- a weighbridge,
- a 150m^2 NCC class 6 office/amenities building constructed to BAL-12.9 standard with parking for 10 vehicles,
- a septic waste water system and infiltration pit for 20 people,
- a 600kl fire water tank and fittings and a 600kl general water storage tank,
- 1km of internal roads to/from the shed and more earthworks for drainage.

4.3.3 Gin stage

At 30,000 tonnes of modules per annum the gin would produce approximately 50,000 bales of cotton and 15,000 tonnes of seed each year. (At a ginning rate of 40 bph, 50,000 bales requires 1,250 operating hours.) The physical facilities to be constructed include:

- a 2,500m^2 clear span, skillion roof, NCC class 8 cotton gin building, with a.240m^2 "lean to" ancillary structure for leaf & stick despatch,
- a second weighbridge,
- parking for an additional 15 vehicles,
- a 350m^2 NCC class 8 stores building,
- a second 600kl fire water tank and two more 600kl general water tanks,
- roof top solar panels.

4.3.4 South Module Storage stage

South module storage has capacity of 7,240 round modules (approximately 16,500 tonnes of seed cotton). The physical facilities to be constructed include:

- a 18.1ha module pad,
- 300m further extension to the internal road network and more earthworks for drainage.

4.4 Cost

The *estimated cost of development*[30] is $15.338 million, inclusive of GST (see Attachment II – Quantity Surveyor's Report). The cost has been estimated by Lindsay Doyle & Associates, registered quantity surveyors, based upon information provided by the proponent. The breakdown of the total cost by stage of development is:

Stage	**Cost**
North Module Storage	$ 940,332
Shed	$ 2,865,000
Gin	$ 9,757,400
South Module Storage	$ 381,000
GST	$ 1,394,373
Total	**$15,338,105**

4.5 Operation

4.5.1 Operating Season

The proposed development would actively receive cotton modules for approximately three months of the year, normally from mid March. The ginning season is normally for about four to five months from April. Products are despatched during this time and inventories are depleted quickly after ginning ceases each year. Outside these periods maintenance is undertaken by permanent employees.

4.5.2 Hours of Operation

The module storage yards would receive cotton modules from 6:00 to 18:00 daily.
The gin would operate up to 24 hours per day. There is a heavy bias towards daylight hours for product despatch.
Outside the operating season the hours are normally 7:00 up to 17:00 on weekdays. Occasionally weekend overtime is worked.

4.5.3 Employees

Module storage requires 3 people on average. In round the clock production ginning employs a team of people on shifts, about 20 in aggregate. During the off-season about 6 people are employed.

30 § 208 EP&A Regulation 2021

4.6 Construction

Construction of a module storage pad, roads and drainage works are essentially straight forward earthwork excercises, undertaken during normal daylight hours with civil plant (graders, rollers, water trucks etc.). The duration of the work is about two months for each Module Storage area. *EPA Best Practice* precautions and established designs[31] will be followed for dust suppression and erosion and sediment control. Noise generating construction work will be restricted to *standard construction hours*[32].

Construction of the Shed and Gin are anticipated to take about four months and eight months respectively. They are normal building activities and are undertaken during daylight hours. There will be delivery truck arrivals and construction equipment such as mobile cranes on site. Again activities will adhere to *EPA Best Practice* precautions and established designs[31] for dust suppression and erosion and sediment control. Noise generating construction work will again be restricted to *standard construction hours*[32]. Construction traffic is addressed in Appendix E – Traffic Impact Assessment.

5 Statutory Planning Context

The proposed development is subject to the EP&A Act and Regulation, statutory Planning Instruments (LEP, DCP, SEPPs), relevant Regional Plans and other particular State and Federal legislation or regulations.

5.1 Environmental Planning and Assessment Act

In respect of the provisions of the EP&A Act and Regulation the proposed development is *Local* development, not *Integrated*, not *Nominated Integrated*, and not *Designated* development. LPSC is the authority for determining the development application (see section 2). Bushfire protection matters pursuant to EP&A Act[33] are addressed below in section 6.5.

5.2 Planning Instruments

5.2.1 Local Environmental Plan

Under the LEP the site's zoning is RU1. The land use, *rural industry*, is permissible with Council consent in this zoning. In the LEP's Lot Size Map[34], the minimum lot size for the property and its surroundings is 200 hectares. Lot size is not a directly relevant matter for this project, because the actual lot size of 498.7 hectares exceeds the minimum and the proposed development does not involve subdivision. The site is outside the shaded regions of the LEP's Heritage map[35]. Heritage matters are addressed further in section 6.6.

5.2.2 Developmental Control Plan

In respect of the provisions of the DCP, this document and its attachments fulfill the requirements[36] of a development application and the proposed development complies with the applicable provisions of the DCP. More specifically, the property is not *Flood Prone land*[37] and the buildings will be constructed to the standards in the BCA. Potential Environmental Effects and Erosion & Sediment Control measures are addressed separately below (see section 6).

5.2.3 State Environmental Planning Policies

Table 2 on the next page provides comments on the applicability of various SEPPs to the development, including those SEPPs which Council, under its DCP, must take into consideration and SEPPs for which Council's planning staff have explicitly asked the proponent for a response.

31 NSW Department of Planning and Environment's "Blue Book" and ARRB's Unsealed Roads Manual
32 NSW Interim Construction Noise Guidelines.
33 §47 NSW Environmental Planning and Assessment Act 1979
34 Liverpool Plains Local Environmental Plan 2011 Lot Size Map – Sheet LSZ_001
35 Liverpool Plains Local Environmental Plan 2011 Heritage Map – Sheet HER_001
36 §2.1.3 Liverpool Plains Shire Council Development Control Plan 2012 as amended 2021
37 DCP Appendix A, page 53, LEP Flood Planning Map

Table 2: Commentary on applicability of SEPPs

SEPP	Comment
State Environmental Planning Policy (Planning Systems) 2021	Replaces SEPP (State and Regional Development) 2011. Replaces SEPP (Aboriginal Land) 2019 Replaces SEPP (Concurrences and Consents) 2018 Not Applicable. The development is not of *State* or *Regional significance* and referral and concurrence are not relevant (refer to section 2). It is not on land owned by the Local Aboriginal Land Council.
State Environmental Planning Policy (Exempt and Complying Development Codes) 2008.	Not applicable. The development is not *Exempt* nor *Complying* (refer to section 2).
State Environmental Planning Policy (Biodiversity and Conservation) 2021	Replaces several SEPPs including SEPP (Koala Habitat Protection) 2020, which supercedes SEPP Koala Habitat Protection (2019). This SEPP is pertinent to the proposed development and its implications are reviewed immediately following this table. (Note Chapter 2 of this SEPP does not apply to land in Liverpool Plains LGA or land zoned RU1, and is therefore not applicable for the proposed development.)
State Environmental Planning Policy (Resilence and Hazards) 2021	Replaces SEPP No.55 – Remediation of Land. Replaces SEPP No.33 - Hazardous and Offensive Development. Replaces SEPP (Coastal Management) 2018. Not applicable. The development is not on contaminated land. It is not *hazardous* or *offensive*. It does not contemplate inventories of *dangerous goods*. The development is in the Liverpool Plains LGA, not a a coastal zone.
State Environmental Planning Policy (Transport & Infrastructure) 2021	Replaces SEPP (Infrastructure) 2007 and SEPP (Major Infrastructure Corridors) 2020, and other SEPPS. Not applicable. The development is not a *Traffic Generating Development* (refer to section 2). The development does not involve or impinge on infrastructure facilities or major transport corridors.
State Environmental Planning Policy (Industry and Employment) 2021	Replaces SEPP No. 64 Advertising and Signage, and other SEPPs. Not applicable. The develoment is not on *employment land* and does not involve signage other than that permissible under the DCP.
State Environmental Planning Policy (Resources and Energy) 2021	Not applicable. The development does not involve mining or extractive industries.
State Environmental Planning Policy (Primary Production) 2021	Replaces several SEPPs, including SEPP (Primary Production and Rural Development) 2019, which replaces SEPP No. 30 - Intensive Agriculture and SEPP (Rural Lands) 2008. Not applicable. The development is not *intensive agriculture* and the property is not *prime agricultural land.*
State Environmental Planning Policy (Precincts – Regional) 2021	Not applicable. The development is in Liverpool Plains LGA which has not been declared an *Activation Precinct*.
SEPP No. 65 – Design Quality of Residential Flat Development	Not applicable. The development is not residential.
SEPP (Seniors Living) 2004	Now SEPP (Housing) 2021. Not applicable. The development is not residential.
SEPP (Building Sustainability Index: BASIX) 2004	Not applicable. The development is not residential.

Chapter 3, Koala Habitat Protection 2020, of SEPP (Biodiversity and Conservation) 2021 is applicable to the proposed development[38]. Pursuant to the SEPP,

> "before a council may grant consent to a development application for consent to carry out development on land to which Part 3.2 of the SEPP applies, the council must be satisfied as to whether or not the land is a *potential koala habitat*. The council may be satisfied as to whether or not land is a *potential koala habitat* only on information obtained by it, or by the applicant, from a person who is qualified and experienced in tree identification."

Stringybark Ecological Pty Ltd conducted inspections (see Attachment III – Biodiversity Report) and found the site was not *potential koala habitat*. Council is not prevented from granting consent due to this SEPP.

5.3 Regional Plans

In respect of Regional Plans, the proposed development accords with the -

- New England North West Regional Plan 2036 in that it will "encourage diversification in agriculture, horticulture and agribusiness to grow these sectors and harness domestic and international opportunities"[39].
- New England North West Strategic Regional Land Use Plan September 2012[40] in that it does not occupy "*Biophysical Strategic Agricultural Land*".
- NSW North West Local Land Services Local Strategic Plan 2021-2026 in that it helps to "Grow the value of agricultural industries in the region".

5.4 Other Legislation

In respect of other Federal and State legislation or regulations, the provisions of the Commonwealth Environment Protection and Biodiversity Conservation Act 1999 ("EPBC Act") and NSW Biodiversity Conservation Act 2016 are addressed below in section 6.4.

6 Statement of Environmental Effects

Pre-lodgement meetings were held with LPSC's planning staff who provided guidance on the scope of a Statement of Environmental Effects (SEE) for the Development Application. The proponent has responded to this scope. The development description, its operation, approvals and licences, and the determining authority matters have been addressed previously in this document. Impacts and the measures proposed to mitigate them are addressed under the various headings below with reference to regulatory contexts and acceptable standards.

6.1 Dust

There are two potential sources of dust generation from the operation of the proposed development – dust in atmospheric exhausts from the ginning process and dust from vehicular and mobile plant movements. During construction there is the potential of dust from earthworks.

The plant for the Gin stage of the development will include dust control equipment (plenums, cyclones and the like) so that the dust in atmospheric discharges from ginning will be below the 100mg/m^3 TSP limit[41].
The dust from vehicles and earthworks will be reduced to acceptable levels by water spray dust suppression and low vehicle speeds. The module operations occur during the cooler months when water sprays are more effective.
The earthworks will only potentially create dust during the construction periods, which are not long.
With the mitigation measures dust is not anticipated to be a significant impact.

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38 State Environmental Planning Policy (Biodiversity and Conservation) 2021.
§3.3(1)(a) The proposed development land is zoned RU1 and Liverpool Plains is an LGA listed in SEPP (Koala Habitat Protection) 2021 Schedule 1 and is not excluded by marking with an *.
§3.5(c)(i) The land has an area of more than 1 hectare.

39 Page 62, New England North West Regional Plan 2036

40 Page 19, New England North West Strategic Regional Land Use Plan September 2012

41 NSW Protection of the Environment Operations (Clean Air) Regulation 2021 §44(1)(c) - the proposed development is a ***Group C*** activity. §45 - the 100mg/m^3 limit for solid particles air impurity concentration is in Schedule 6.

6.2 Noise

An assessment of the potential noise impacts of the proposed development is provided in Appendix D – Noise Impact Assessment.
Noise from the development and its construction is not anticipated to be *Intrusive* or *Offensive,* or significant in relation to the *Rating Background Noise Levels*.

6.3 Vibration

Vibration impacts are not anticipated from the proposed development or its construction. Earthworks do not involve blasting.

6.4 Biodiversity

Stringybark Ecological conducted a biodiversity assessment. Its report is presented as Attachment III – Biodiversity Report. Vegetation clearing impacts have been minimised (clearing statistics are included in the report). The development is not likely to significantly impact threatened species or ecological communities and it does not trigger the NSW Biodiversity Offset Scheme (BOS).

6.5 Hazards and Risks

The proposed development is not an *Offensive Industry*[42] *or a Potentially Offensive Industry*. *Dangerous goods* or hazardous material will not be used to any significant extent or stored on the site in significant quantities.

Discussions with local residents and aerial photographs (see Appendix B – Historical Aerial Photographs) reveal the site has been used for agricultural purposes continuously since a least June 1975. A search of the NSW EPA's list of notified sites and the contaminated land record (published on 7th July 2022) did not reveal any such sites within the locations of Yannergee or Colly Blue. Based on the site's history, and the search result, contamination is unlikely to be an issue and remediation will not be needed.

The property is classified as *bushfire prone land* by the NSW RFS[43]. As such, any development upon the property is to comply with the requiremenst in the NSW Rural Fire Service's Planning for Bush Fire Protection 2019 (PBP 2019).

A PBP 2019 assessment was undertaken by Mr Stephen Cotter, a Bushfire Planning and Design accredited practitioner. His report is Attachment IV – Planning for Bushfire Protection 2019 Report. The proposed development will be in accordance with the recommendations therein, including:

- management of the site as an Inner Protection Area,
- separation distances from bushfire hazard of 20m to the north, east and south and 25m to the west,
- at least 20kl of water available for bushfire protection,
- at least 10m wide internal roads and crossover,
- the office building, which is more than 137m away from the bushfire hazard, will be built to BAL-12.5 standard so it can be a place of last resort in the event of a fire,
- and a Bushfire Emergency and Evacuation Plan will be created prior to the operation of the facility.

6.6 Heritage

Due Diligence subject to the NSW Department of Environment, Climate Change and Water Code of Practice for the Protection of Aboriginal Objects in New South Wales was conducted on Lot 1632 DP801779 with a 200m buffer. The result of a search of Aboriginal Heritage and Information Management System (AHIMS) was that zero Aboriginal sites are recorded in or near the property and zero Aboriginal places have been

42 §3.3 State Environmental Planning Policy (Resilience and Hazards) 2021
43 https://www.rfs.nsw.gov.au/plan-and-prepare/building-in-a-bush-fire-area/planning-for-bush-fire-protection/bush-fire-prone-land/check-bfpl

declared in or near the property. A copy of the result is Appendix C - AHIMS. Aboriginal sites and places are unlikely to be impacted by the proposed development.

The site is not shaded in the LEP Heritage Map. Other non-Aboriginal heritage issues from the proposed development are unlikely.

6.7 Traffic and Transport

An assessment of the transport and traffic impacts of the proposed development is provided in Appendix E - Traffic Impact Assessment. Vehicular dust and noise impacts are addressed in section 6.1 - Dust and in Appendix D – Noise Impact Assessment.
Twenty five parking spaces have been provided on site for the anticipated demand.
To mitigate traffic and transport impacts the proponent intends to create a Traffic Management Plan for the site and enforce an appropriate Drivers' Code of Conduct for trucks serving the development.
The proponent believes the project and its traffic will not have a significant impact on the function and safety of Council's road network.

6.8 Visual

The visual impact of the development is investigated in Appendix F – Visual Impact Assessment. For private landowners 4km west of the site part of the the development's buildings will be visible in the distance. For travellers on Coonabarabran Road the southern facades of the buildings will be visible 1.2km away. The proposed buildings are not out of character with other structures within the LGA (grain storage, poultry sheds, farm buildings, etc). Cotton modules, visible in the distance, are commonplace within the LGA. To the extent there is visual exposure, it will not be incongruous or particularly eye catching. To mitigate visual impacts the facade colours and styles of buildings will be chosen to be unobtrusive. The proponent believes any visual impact of the proposed development will be acceptable.

6.9 Water and Utilities

Cotton ginning consumes water. The storm water from the roofs of the buildings will be collected. Initially it will be reserved for fire protection. Subsequently it will be stored for consumption in the ginning process and for sundry domestic purposes (bathrooms, etc). Sewage from toilets and greywater will be treated on site in an appropriate septic system and the effluent will be discharged into an infiltration pit. If there is surplus water collected from roofs, it will augment runoff waters. If there is insufficient rain water, fresh water will be purchased and trucked into the facility.

Runoff from the pads and roads on the site will be captured in drains that eventually lead to the western perimeter drainage channel. Normal erosion and sediment control practices[44] will be implemented. The runoff will be harvested in the detention dams. It will be used for dust suppression, on-site irrigation and auxiliary fire protection purposes. The surplus, if any, will be decanted before draining down the slope into the vegetation at the west of the site. Stormwater runoff is not expected to be a significant impact.

The gin will require energy. Energy economics are highly uncertain at the time of this application. The current plans are for rooftop solar augmented during ginning by mobile packaged diesel generators. Apart from mobile phone signals no other utilities are involved with the development.

6.10 Sustainability and Waste

The ginning of cotton modules is essentially a process which mechanically separates raw cotton into its components and as such does not generate waste or effluent. The raw material, cotton from the harvest, is separated into cotton fibres (lint), seed and impurities (predominantly leaf and stick material). The cotton fibre is the highest value product and the ginning process is optimised for its recovery. Gravimetrically seed is not as highly priced as lint, but is still a valuable saleable commodity and also captured to the maximum extent possible. The final leaf and stick fraction is isolated effectively in order to minimise its entrained lint

44 NSW Department of Planning and Environment's "Blue Book"

and seed content. It is recovered and recycled[45] to the fields from whence it originated for soil augmentation. The yellow module plastic wrap is also a salable recyclable item. The economic efficiency aims of the business align with the aim of minimising waste.

Other sundry, general waste materials, such as packaging materials, spent lubricants, worn out machine components, scrap metal, domestic garbage, etc are responsibly handled at appropriate waste disposal facilities. The proponent is aware of the proper methods for disposal of wastes. Waste will not be a significant impact of the development.

7 Conclusion

The proposed development is a staged cotton gin project on land, zoned RU1:Primary Production, at Wandobah Rd, Yannergee. The gin will have a capacity not exceeding 30,000 tonnes of cotton modules per annum.

The estimated construction cost of the complete development is $15.338 million.

The land use, *rural industry,* is permissible with consent and supports the objective for the zoning.

The development is a Local development for which the LPSC is determining authority. There are no statutory or regulatory requirements for concurrence or referral to other bodies.

The proponent believes the proposed cotton gin development is a very suitable land use for the site, and is consistent with the agricultural character of the vicintiy and rural surroundings.

The proposed development fulfills statutory planning requirements and supports the aims of the LPSC.

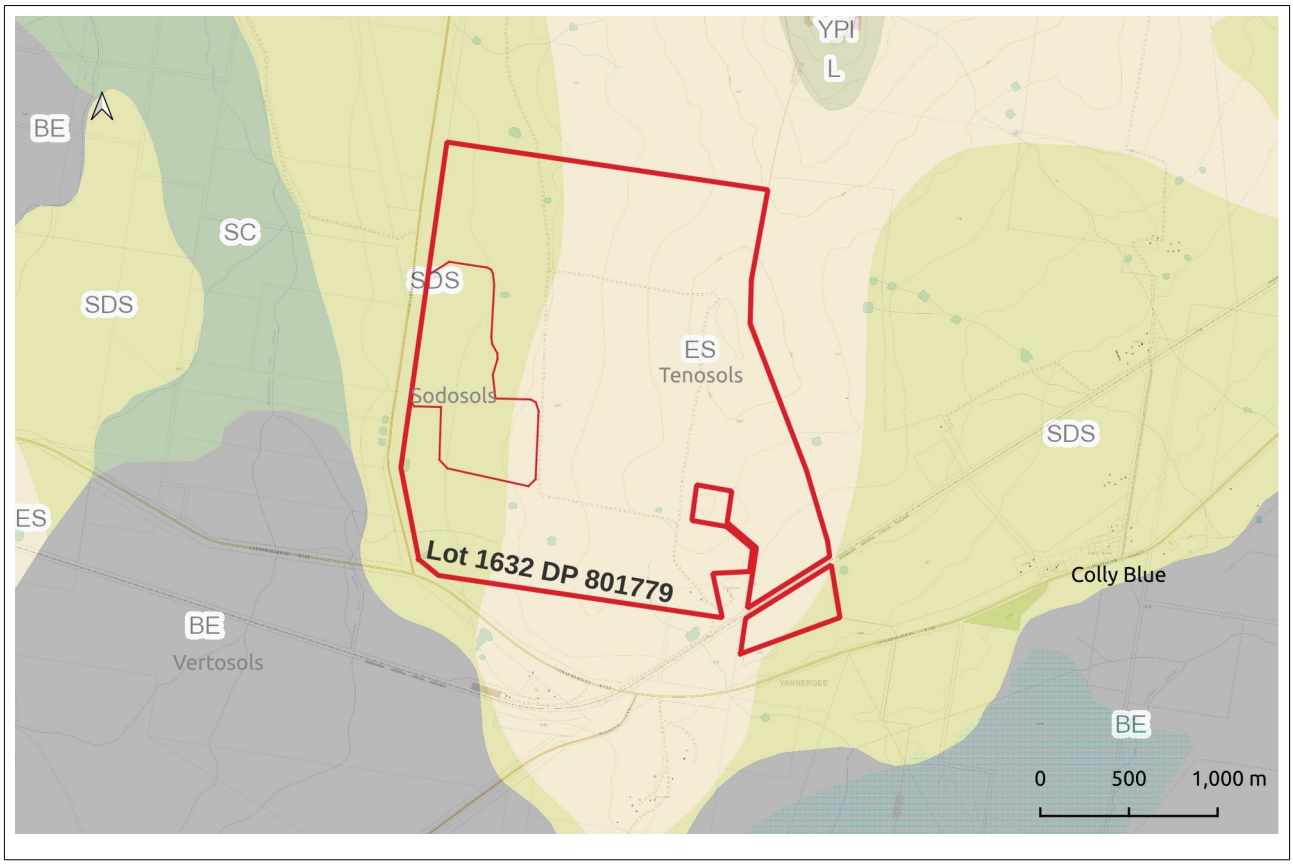
The development is economically advantageous to the shire and local community, without being unacceptably intrusive or causing disruptive social impacts.

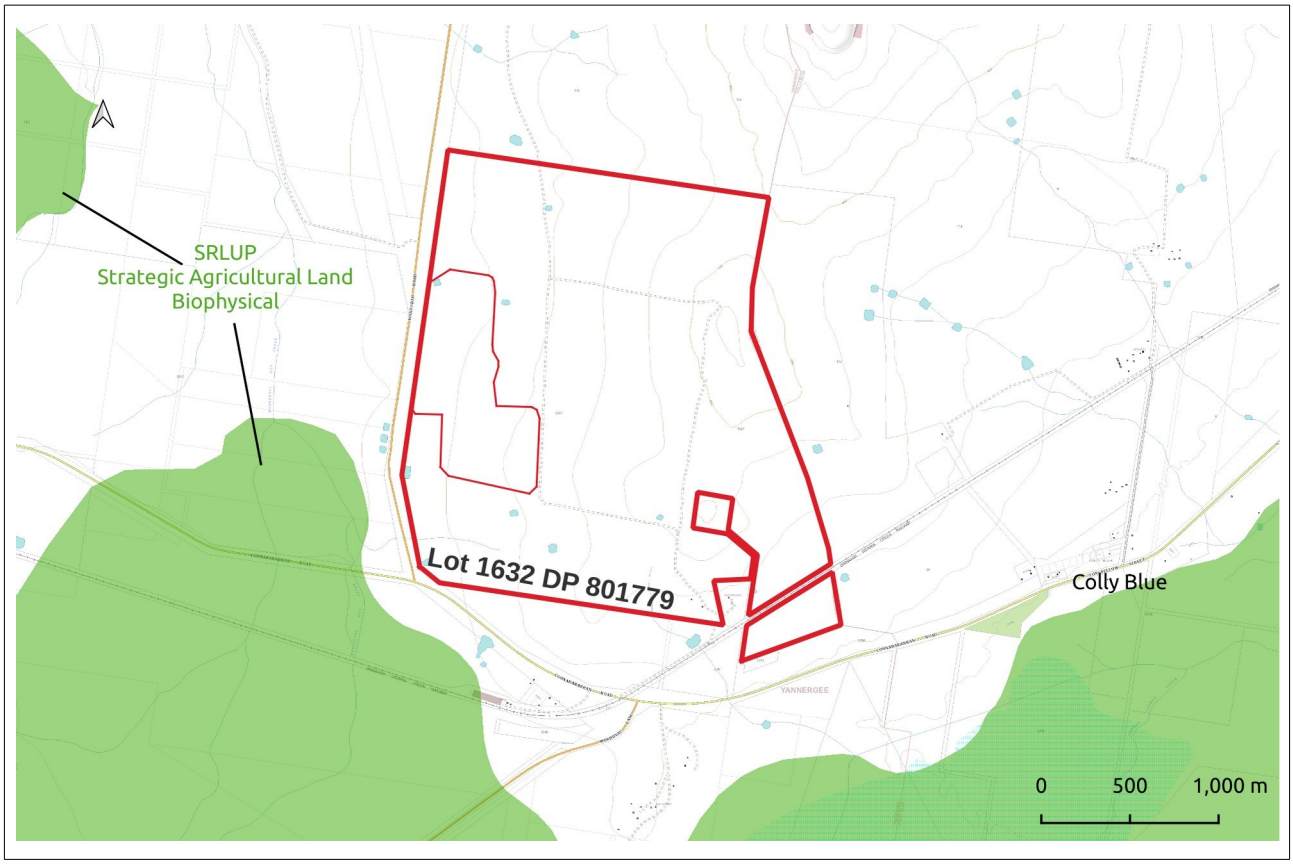
The development has been carefully designed to mitigate environmental impacts. No significant adverse enviromental impacts have been identified.

Scott Davies
Director Agri Hub Pty Ltd
15 December 2022

45 EPA Resource Recovery Orders 2016 pursuant to §91,92 & 93 Protection of the Environment Operations (Waste) Regulation 2014

Appendix A - Excerpts from Soil Type Map and SAL Map





Appendix B - Historical Aerial Photographs

6th November 1993

1st April 1984

2nd June 1975

Appendix C - AHIMS

AHIMS Web Services (AWS)
Search Result

Your Ref/PO Number : Agri Hub Pty Ltd

Client Service ID : 702899

Grant Meares

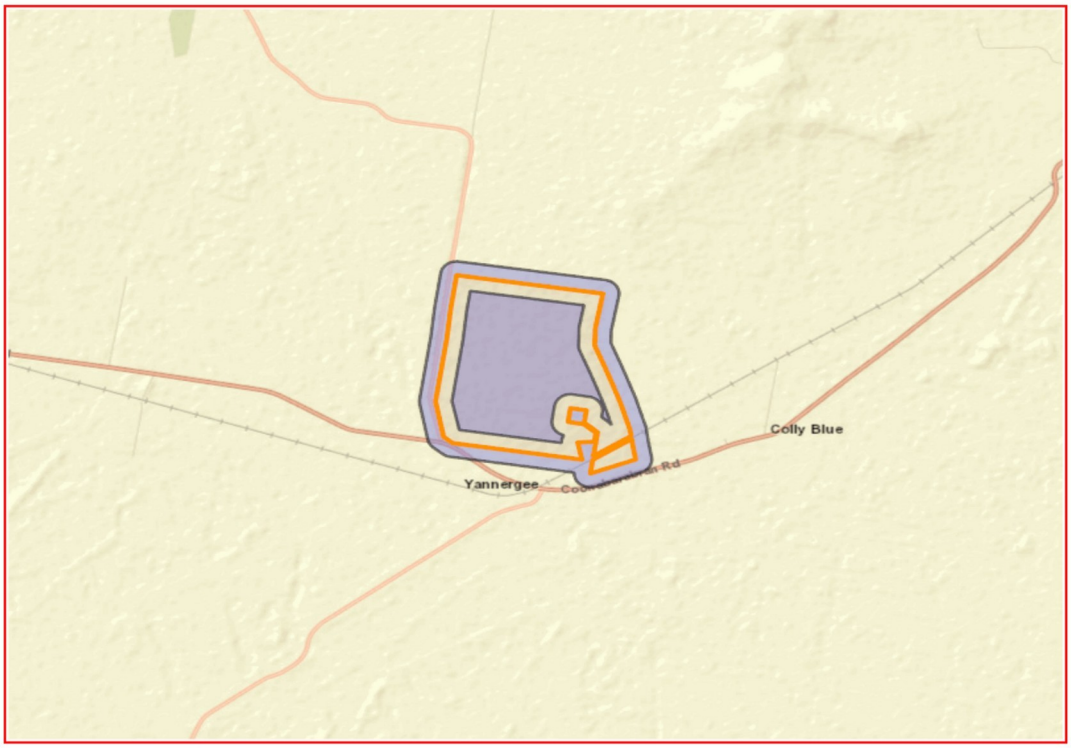
Date: 25 July 2022

Attention: Grant Meares

Dear Sir or Madam:

AHIMS Web Service search for the following area at Lot : 1632, DP:DP801779, Section : - with a Buffer of 200 meters, conducted by Grant Meares on 25 July 2022.

The context area of your search is shown in the map below. Please note that the map does not accurately display the exact boundaries of the search as defined in the paragraph above. The map is to be used for general reference purposes only.



A search of Heritage NSW AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that:

0	**Aboriginal sites are recorded in or near the above location.**
0	**Aboriginal places have been declared in or near the above location. ***

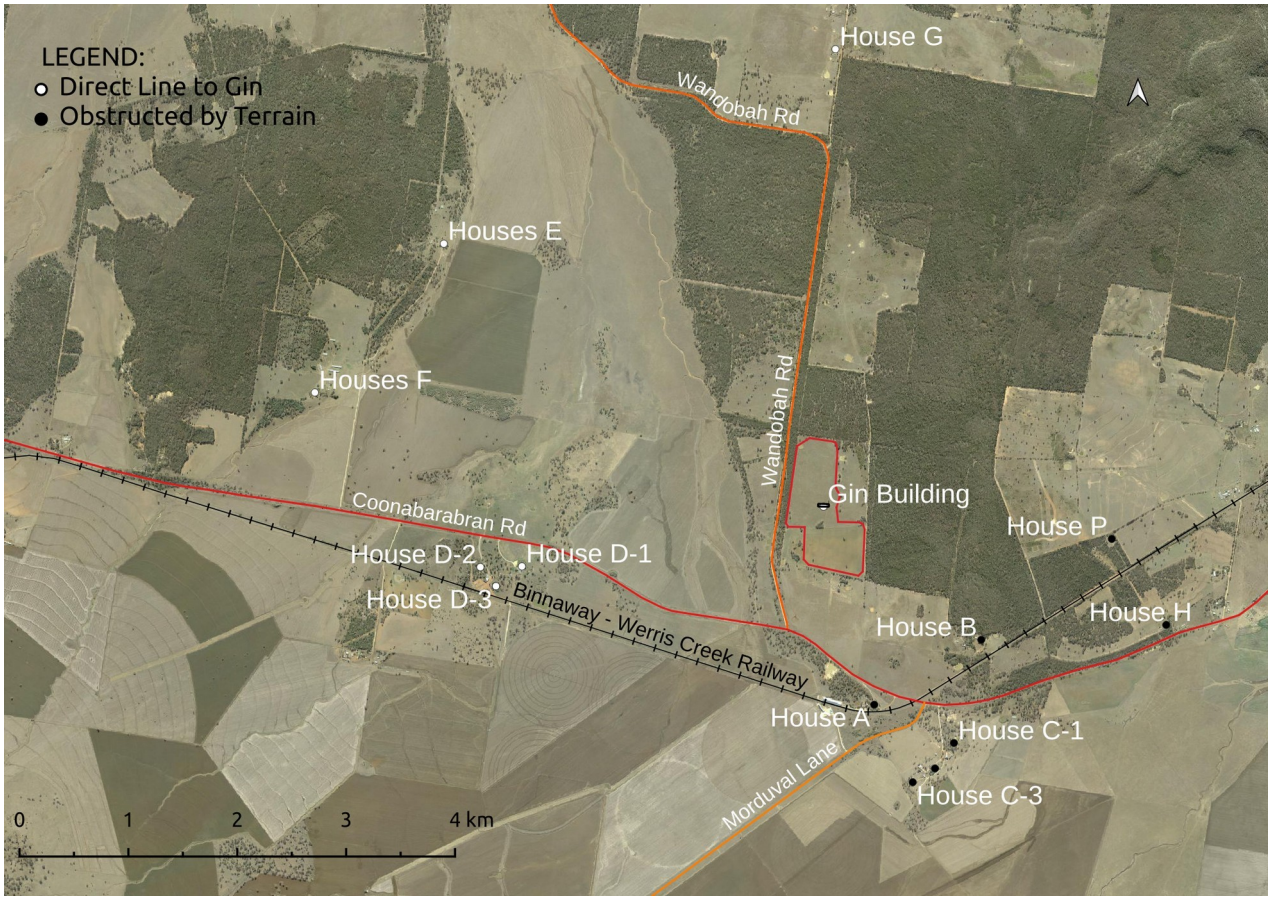
Appendix D - Noise Impact Assessment

There are two potential noise sources from the operation of the proposed development - noise due to vehicular and mobile plant movements, and noise due to the operation of the ginning machinery. During construction there will be noise due to civil earthmoving plant (bulldozer, grader, excavator, roller, loader, trucks, water cart, etc.) and construction equipment (power tools, mobile cranes, welders, concrete machinery, elevated work platforms, forklifts, etc.).

The vehicle noise is subject to usual mitigation measures – mufflers, broad band reversing alarms, disabling exhaust brakes, proper maintenance, etc. Ginning noise is mitigated by using cladding, noise enclosures, exhaust mufflers, sound barriers & baffles and other techniques commonly employed in the industry to either eliminate noise at the source, or attenuate its transmission. The construction noise is mitigated with normal precautions such as mufflers, deployment in a manner which minimises noise disturbance and work during *standard construction hours*[46].

The site is not close to built up areas. The nearest potential noise receptors have been identified for a 360° sweep around the development. Their locations have been alphabetically labelled for convenience (see Figure 4).

Figure 4: Potential Noise Receptor Locations



46 Table 1 Interim Construction Noise Guideline Department of Environment & Climate Change NSW

The *Intrusiveness*[47] [48] and/or the *Offensiveness*[49] of vehicle noise from the proposed development is negligible for Houses A, B, C & D due to their proximity to the Coonabarabran Rd traffic compared to their distances to the development site. See Table 3 for the applicable distances. For Houses E, F & G, the vehicle noise from the development site will be negligible due to the absolute distance from the site (more than 4 km). Houses H & P are on the other side of Colly Blue Mountain's ridge and will not have a noise exposure.

Table 3: Potential Noise Receptor Distances

Potential Noise Receptor (see Figure 4 for locations).	Distance - Receptor from Coonabarabran Road	Distance - Receptor to Development
House A	140m	1,872m
House B	536m	1,892m
Houses D*	223m	2,829m
Houses C	≈ 570m	≈ 2.500m
House G	-	4,190m
Houses E	-	4,239m
Houses F	-	4,793m

*Closest of the three.

In respect of ginning noise, the noise levels at a distance of 50m[50] from the gin building wall are not anticipated to exceed 65 dB $L_{Aeq\ (15\ minute)}$. The distance between the gin building and the potential receptors substantially attenuates the ginning noise. The noise level at the receptor locations can be estimated using a calculation[51] for free field hemispherical sound propagation on a reflective plane. In the case of receptors where there is not a direct line of sight between the gin and the receptor, there is additional terrain attenuation. The amount of terrain attenuation depends on the diffraction of the sound path caused by the height of the terrain barrier. Vegetative ground cover on the terrain also attenuates noise. The predicted ginning noise for relevant receptors in descending order is shown in Table 4. Again, Houses H & P are on the other side of Colly Blue Mountain's ridge and will not have a noise exposure.

47 Noise is "intrusive" if it is noticeably louder than the background noise and considered likely to disturb or interfere with those who can hear it. Noise Guide for Local Government 2013

48 Noticeably louder is often taken as L_{A90} background +5 decibels. Noise Guide for Local Government 2013

49 'Offensive noise' is defined in the dictionary of the PoEO Act as noise:
(a) that, by reason of its level, nature, character or quality, or the time at which it is made, or any other circumstances:
(i) is harmful to (or is likely to be harmful to) a person who is outside the premises from which it is emitted, or
(ii) interferes unreasonably with (or is likely to interfere unreasonably with) the comfort or repose of a person who is outside the premises from which it is emitted, or
(b) that is of a level, nature, character or quality prescribed by the regulations or that is made at a time, or in other circumstances, prescribed by the regulations.

50 Noise Guide for Local Government 2013, Appendix 1 Technical Note 7 - 50m is outside the near field

51 Noise Guide for Local Government 2013, Appendix 1, Technical Note 6. "The following relationship can be used to quantify distance attenuation: SPLx = SPLy – 20 log(dx/dy), for a point source."

Table 4: Anticipated Ginning Noise Levels

Potential Receptor (see Figure 4 for locations).	Distance Receptor to noise source	Expected noise, no terrain effect	Terrain Attenuation	Anticipated noise at Receptor
Houses D	≈ 2,9kmm	31 dB_A	No	31 dB_A
House A	1.9km	34 dB_A	Yes	31 dB_A
Houses C	≈ 2.5km	31 dB_A	Yes	26-28 dB_A
House G	4.2km	27 dB_A	No**	26 dB_A
Houses E	4.2km	26 dB_A	No	26 dB_A
Houses F	4.8km	26 dB_A	No	26 dB_A
House B	1.9km	30 dB_A	Yes	20 dB_A

**Vegetation attenuation.

The anticipated ginning noise levels at potential receptors are very low, of the same or lesser magnitude as minimum *Rating Background Levels*[52]. The development's noise from the operation of the gin is unlikely to be *Offensive* or *Intrusive*.

52 See definition in Glossary of Noise Guide for Local Government 2013

Appendix E - Traffic Impact Assessment

Introduction

From a macro perspective the proposed development does not have any additional traffic impact on the broader road network. Without the development, cotton modules harvested in the LGA are transported by truck from the various fields to beyond the LGA for ginning. After the commissioning of the proposed cotton gin, the modules would be transported to the gin, and then the modules' constituent lint and seed would be transported beyond the LGA (less any seed locally consumed at feed lots). The truck vehicle movements on the network would be less because cotton module truck loads are volumetrically limited but cotton lint loads and seed loads are gravimetrically limited. The other project traffic on the road network is essentially the light vehicles of employees going to and from work. In light of the macro situation, the traffic impact assessment focuses on the site access crossover, Wandobah Rd south of the crossover, the intersection of Wandobah and Coonabarabran Roads, and Coonabarabran Rd near the intersection.

The assessment has been undertaken with reference to the Austroads Guides to Road Design. Where relevant the Extended Design Domain (EDD[53]) has been used. The EDD represents alternative design criteria for assessment of existing roads or brownfields sites.

Site Access

The public road immediately adjacent to the property and development site is Wandobah Rd. A two way, two lane, unsealed, 90° crossover through the road reserve from Wandobah Rd is proposed to connect the development to the public road network The crossover will be 1.2km north of the intersection with Coonabarabran Rd and 0.4km north of the nearest floodway. Sight distances[54] from the crossover to both the north and south are very good at more than 400m. The crossover will have sufficient width so that trucks can enter and leave the site without swept paths extending outside their lanes. Traffic is insufficient (see below Table 6 and Table 7) for delays to be an issue.

Project Traffic

Cotton modules arriving at the proposed development will originate at farms and fields dispersed throughout the vicinity, mainly within the LGA. The anticipated truck routes for cotton modules arriving at the development site and the proportion of the total modules using that route are shown in Table 5.

Table 5: Module Routes

Cotton Module Source	Cotton Module Delivery Truck Route	Proportion
from the east/southeast	along Coonabarabran Rd in a westerly direction and then north for 1.2km along Wandobah Rd, turning right into the site	60%
from the west/southwest	along Coonabarabran Rd in an easterly direction and then north for 1.2km along Wandobah Rd, turning right into the site	30%
from the north	along Wandobah Rd in a southerly direction, turning left into the site	10%

Most of the module delivery trucks are expected to be semi-trailers, carrying six modules, or B-Doubles, carrying nine modules. Rigid chassis farm trucks are rarely used for module transport. A small number of trucks may have double stacked trailers which can carry 12 modules. A module weighs approximately 2.5 tonne.

The principal products despatched from the gin are cotton (lint) and seed. Cotton trucks are usually curtain sided B-Doubles. Seed trucks are usually articulated tippers. Trucks carrying these products from the site will turn south on to Wandobah Rd, then east at the intersection of Coonabarabran Rd and then continue

53 §4.4.2, Austroads Guide to Road Design Part 1: Objectives of Road Design, 2021.

54 §3.4, Austroads Guide to Road Design Part 4A: Unsignalised and Signalised Intersections 2017. Sight Distances at Property Entrances (Exits). §3.2.3 Minimum Gap Sight Distance for driver's eye height of 1.1m and a object height of 0.65m.

east through Colly Blue, Spring Ridge and Caroona to the Kamilaroi Highway, a *Classified*[55], *State Highway*[56]. Seed deliveries for local feedlots will follow this route but diverge from Coonabarabran Rd towards the feedlot at a convenient juncture. Any cotton modules which are sent to the Carroll Cotton gin and any seed which is sent to Narribri will also follow this route to the Kamilaroi Highway and then travel north. Trucks destined for intermodal facilities at Werris Creek will again go north on the Kamilaroi Highway and turn off at Taylors Lane.

Employee light vehicle traffic could come from any direction. It is anticipated that most the employees are likely to come from and return to the east and smaller proportions from the west and north. Delivery of consumables and other truck arrivals are likely to come and go from the Kamilaroi Highway.

Traffic from the proposed development will be seasonal (mid-March to mid-September). For traffic analyses it is appropriate to use seasonal average daily traffic rather than annual averages. The busiest traffic scenario is a day during both cotton picking season and ginning season. The peak hourly and average daily traffic volumes in this scenario envelope all other circumstances, including construction traffic situations. Table 6 contains forecast data for traffic due to the project for the busiest scenario.

Table 6: Forecast Project Traffic

Location	ADT	% heavy vehicles	Morning peak hour	am peak traffic	Afternoon peak hour	pm peak traffic
Coonabarabran Rd east of Wandobah Rd	92 vpd	34%	06.45am to 07.45am	17 vph	3.30pm to 4.30pm	16 vph
Coonabarabran Rd west of Wandobah Rd	21 vpd	39%	07.15am to 08.15am	4 vph	3.30pm to 4.30pm	2 vph
Wandobah Rd north of site	14 vpd	20%	07.15am to 08.15am	3 vph	3.30pm to 4.30pm	2 vph
Wandobah Rd south of site	113 vpd	35%	06.45am to 07.45am	21 vph	3.30pm to 4.30pm	18 vph

The project average daily traffic figures are low. The project traffic peak statistics are dominated by up to 13 employee and visitor light vehicles arriving for the day's work during the morning peak hour.

Background Traffic

Available traffic data for the vicinity have been provided by Council's staff and are shown in Table 7.

Table 7: Background Traffic Data

Location	ADT	% heavy vehicles	85% speed	Morning peak hour	am peak traffic	Afternoon peak hour	pm peak traffic
Coonabarabran Rd 400m east of Wandobah Rd	585 vpd	37.6%	114kph	11.15am to 12.15pm	52 vph	2.30pm to 3.30pm	51 vph
Coonabarabran Rd 400m west of Wandobah Rd	568 vpd	27.4%	110kph	11.15am to 12.15pm	49 vph	2.30pm to 3.30pm	51 vph
Wandobah Rd 300m north Coonabarabran Rd	34 vpd	22%	87 kph	11.45am to 12.45pm	3 vph	4.45pm to 5.45pm	3 vph

The existing traffic on Coonabarabran Rd at the vicinity is low and the traffic on the side road, Wandobah Rd, is extremely low.

55 NSW Roads Act 1933, Classified Road #29, NSW Government Gazette 12/2/1999
56 TfNSW, NSW Road Management Arrangements

Combined Background and Project Traffic

The project traffic and the existing background traffic are shown diagramatically in Figures 5 & 6. The forecast project traffic peaks do not coincide or overlap with the background traffic peaks. So the peak statistics for Coonabarabran Rd remain unchanged. The combined project traffic and background traffic is still low. In all instances, in all locations the traffic is forecast to be less than 100 vehicles per hour.

Figure 5: Peak Hourly Traffic

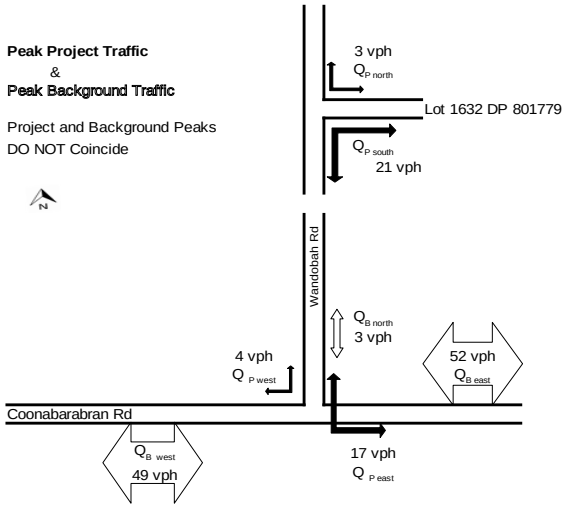
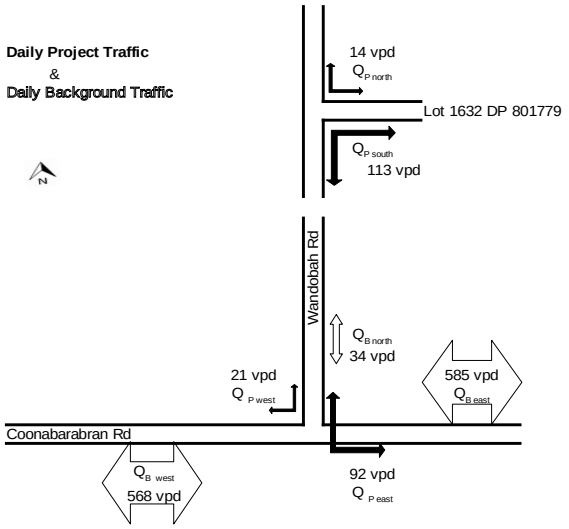


Figure 6: Daily Traffic



Roads

Wandobah Rd is a two way, two lane, all weather, unsealed, *unClassified*[57], *Local*[58], *Class 4*[59], rural road. The pavement formation is approximately 9.0m wide including shoulders. There are table drains along both sides. The vertical grade along Wandobah Rd (and for the proposed crossover) is negligible. There is a bend in Wandobah Rd half a kilometre south of the proposed crossover, otherwise the road is straight in the vicinity. The sight distances[60] to the proposed crossover from both directions are greater than 400m. The sight distance[61] to the "T" intersection with Coonabarabran Rd is more than 400m. No speed limit sign is evident. The default limit is 100kph. There are floodways approximately 400m south and 500m north of the proposed crossover. Traffic speeds in the vicinity are lower than the speed limit due to the floodways. The 85% speed is estimated to be less than 80kph. Wandobah Rd is within an *Approved Area*[62] for B-Double trucks.

Coonabarabran Rd (a.k.a. Purlewaugh Rd) is a *Classified, Main*[63], *Regional*[58], *Class 3*[59] rural road and one of the major east-west arterial roads through the LGA. It is two lane, two way and sealed, with a seal width between 7.2m and 7.5m. The total carriageway width including unsealed shoulder width is around 9.0m. The posted speed limit is 100 kph. In the vicinity of the intersection with Wandobah Rd, the vertical grade of Coonabarabran Rd slopes approximately 2% down towards the west. The road is straight on the western side of the intersection and gently curves (in the order of 700m radius) on the eastern side of the intersection. The sight distance[64] to the intersection from the west is greater than 400m and from the east is 400m. Coonabarabran Road is an *Approved Route*[62] for B-Double trucks. Coonabarabran Rd is part of a school bus route. The nearest bus stops are about 1.5km east and 4km west of the intersection with Wandobah Rd.

The "T" intersection of Wandobah Rd, the side road, with Coonabarabran Rd, the major road, is an unsignalised rural intersection with *Basic Right* and *Basic Left* turn treatments (BAR, BAL)[65]. The side road is at approximately 65°. The vertical grades at the intersection and its approaches are low. There is seal 50m up Wandobah Rd. Due to the low predicted combined traffic delays at the intersection will be negligible.

57 NSW Roads Act 1933
58 TfNSW, NSW Road Management Arrangements. Road #73 LPSC Road Map 21 December 2006.
59 Table 4.1, Austroads Guide to Road Design Part 1: Objectives of Road Design, 2021
60 §3.4, Austroads Guide to Road Design Part 4A: Unsignalised and Signalised Intersections 2017. Sight Distances at property Entrances. §3.2.2, Safe Intersection Sight Distance for driver's eye height of 1.1m and a object height of 1.25m.
61 §3.2.1, Austroads Guide to Road Design Part 4A: Unsignalised and Signalised Intersections 2017. Approach Sight Distance for driver's eye height of 1.1m and object height of 0.0m.
62 TfNSW Interactive Restricted Access Vehicle Map
63 NSW Roads Act 1933, Classified Road #129, NSW Government Gazette 12/2/1999
64 §3.2.2, Austroads Guide to Road Design Part 4A: Unsignalised and Signalised Intersections 2017. Safe Intersection Sight Distance for driver's eye height of 1.1m and a object height of 1.25m.
65 §8.2 Austroads Guide to Road Design Part 4A: Unsignalised and Signalised Intersections 2017.

Aproaching the intersection on Wandobah Rd, there is a single “Give Way” sign on the left and a sight board opposite the intersection. There are guide signs above the sight board and a street sign on the right of side of Wandobah Road. A large tree (bhd 1.2m) is on the road reserve near the left side of Wandobah Rd (see Figure 7).

Figure 7: Photographs of Intersection from Wandobah Road

For vehicles on Wandobah Rd turning into Coonabarabran Rd the sight distance[66] along Coonabarabran Road to the east is 400m, and the sight distance to the west is greater than 400m (see Figure 8 & 9). The nominal sight angle for turns is 115° but vehicles are likely to become more perpendicular to Coonabarabran Rd as they approach the set back line.

Figure 8: Looking East from Wandobah Rd intersection

Figure 9: Looking West from Wandobah Rd intersection

66 §3.2.3, Austroads Guide to Road Design Part 4A: Unsignalised and Signalised Intersections 2017. Minimum Gap Sight Distance for driver's eye height of 1.1m and a object height of 0.65m.

For vehicles on Coonabarabran Road approaching the intersection from the west the sight distance[64] is greater than 400m. For vehicles on Coonabarabran Road approaching the intersection from the east the sight distance[64] is 400m, due to the curve in the road and vegetation on the side of the road. There is a roadside sign warning drivers of the intersection 395m from it (see Figure 5).

Figure 10: Coonabarabran Looking West

The swept paths through the intersection for B-Double trucks have been investigated by superimposing turn paths over aerial photographs. For turns out of Wandobah Rd and right turns into Wandobah Rd there do not appear to be issues. For left turns into Wandobah Road, it appears that safety could be improved by widening the throat of the Wandobah Road (see Figure 11).

Figure 11: Superposition of B-Double Swept Path on Aerial Photograph

The intersection's major road BAL and BAR turn treatments were compared with recommendations from a Supplement to the Austroads design guide[67]. The applicable chart is the Turn Warrant Diagram[68] for two-lane, two-way roads under EDD criteria, with a Major Road Design Speed ≥ 100kmh. EDD is acceptable in this particular situation because it is a brownfields site with low traffic numbers.

The traffic condition used for this comparison is peak traffic on Coonabarabran Rd and anticipated coincident traffic turning into Wandobah Rd. Q_M values, the major road through traffic parameters, were determined in accordance with Figure 12[69] (There is no splitter island in this case). For the right turns from Coonabarabran Rd, Q_M is simply 52vph from Figure 5. For the left turns from Coonabarabran Road, Q_M is conservatively assumed to be two thirds of the two way traffic figure (ie 35vph = 2/3*(52vph). Q_R is assumed to be 10vph and Q_L is assumed to be 4vph[70]. The parameters for the turn warrant diagram are summarised in Table 8. The relevant traffic parameters have been plotted as black circles with white letters "L" and "R" on the Turn Warrant Diagram (see Figure 13). The design guide confirms that the existing BAR and BAL configurations are suitable major road turn treatments for this intersection at the anticipated traffic levels.

Historical Crash Data

Available Crash Data[71] for the five years, 2016 to 2020, shows no crashes on Wandobah Rd and for Coonabarabran Rd there was one Non-Fatal crash[72], 5km away at Colly Blue. There have been other crashes recorded on Coonabarabran Rd but they are not in the vicinity.

Pavement Maintenance

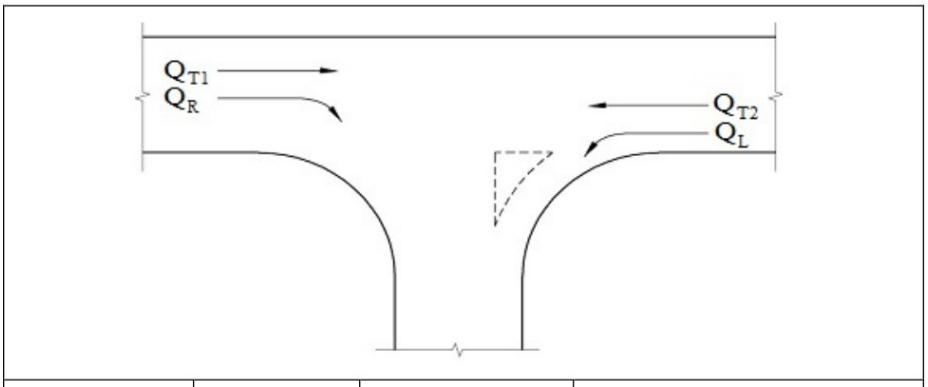
For the sealed road, Coonabarabran Road, the proposed development is not anticipated to make a significant difference to pavement maintenance because much of the cotton crop tonnage is already transported on this road (albeit in a different form). For the first 1.2km of the unsealed road, Wandobah Road, the proposed development will increase the frequency of required maintenance for this section of road.

Assessment

Existing traffic is low. Sight distances are satisfactory. The roads and intersection are adequate for the current situation, with the possible exception of widening the throat of Wandobah Rd. The project does not introduce new traffic hazards or new safety issues. Forecast combined background traffic and project traffic is low and the project component is seasonal. The development does not trigger a need to upgrade roads and the cumulative impacts of the project's traffic volume and other normal traffic growth (2% p.a.) over a ten year period are unlikely to do so. This view is robust to assumptions and forecasts about the project's traffic. There will be no discernable change in transport times. The *Level of Service*[73] will remain at the top level.
The proposed development's traffic will not significantly affect amenity.
Increased frequency of normal maintenance can offset the project's traffic impact on the unsealed pavement of Wandobah Rd.
The proponent believes the proposed development does not significantly impact the safety or function of the road network or require any road upgrades.

67 Appendix A.10, Road Planning and Design Manual – Edition 2:Volume 3 November 2021, Qld Dept. of Transport & Main Roads. Supplement to Austroads Guide to Road Design Part4A Unsignalised and Signalised Intersections
68 Figure 4A-A 4(d), Page 29, Road Planning and Design Manual – Edition 2:Volume 3, Transport and Main Roads, November 2021
69 Figure 4A-A 5, Page 30, Road Planning and Design Manual – Edition 2:Volume 3, Transport and Main Roads, November 2021
70 The project peak traffic does not coincide with the background peaks. For the minor road about half peak values for project traffic plus the background traffic have been assumed.
71 Transport for NSW, Centre for Road Safety, Statistics, Crash and Casuality statistics
72 2017, Crash Id 1139550, Non Casuality Tow away, Struck Animal, Colly Blue
73 Page 62, Austroads Guide to Road Design Part 1: Objectives of Road Design, 2021

Figure 12: Major Road Traffic Parameter - Q_M[69]

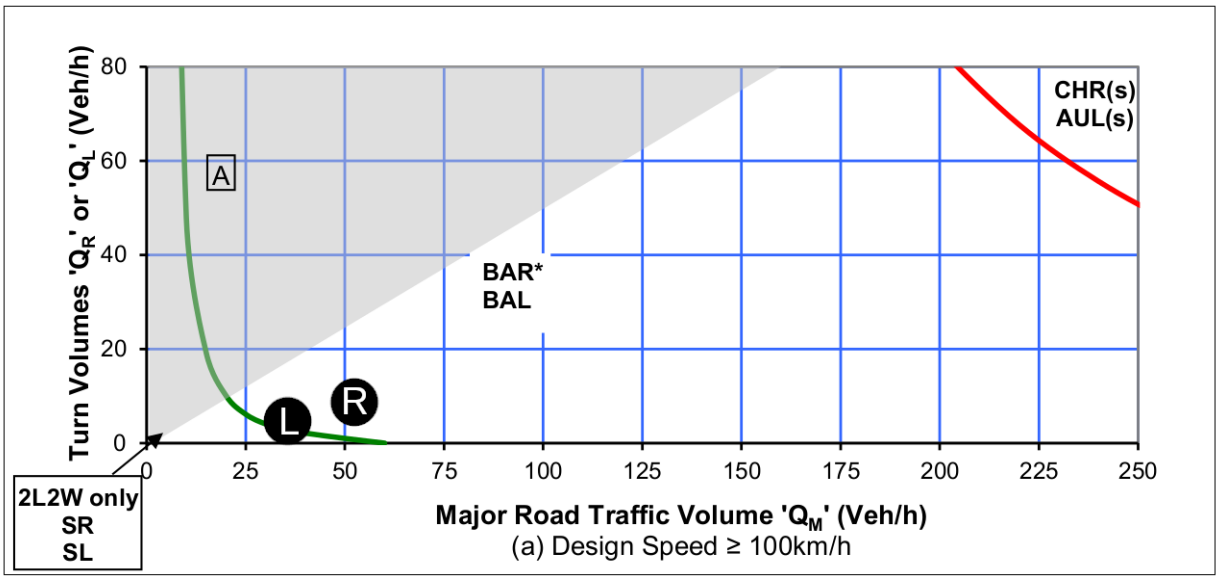


Road Type	Turn Type	Splitter Island	Q_M (veh/h)
2 Lane 2 Way	Right	No	= $Q_{T1} + Q_{T2} + Q_L$
		Yes	= $Q_{T1} + Q_{T2}$
	Left	Yes/No	= Q_{T2}

Table 8: Turn Parameters

	Q_M vph	Q_R vph	Q_L vph
Right Turn from Coonabarabran Rd	52	10	-
Left Turn from Coonabarabran Rd	35	-	4

Figure 13: Turn Warrant Diagram[68]



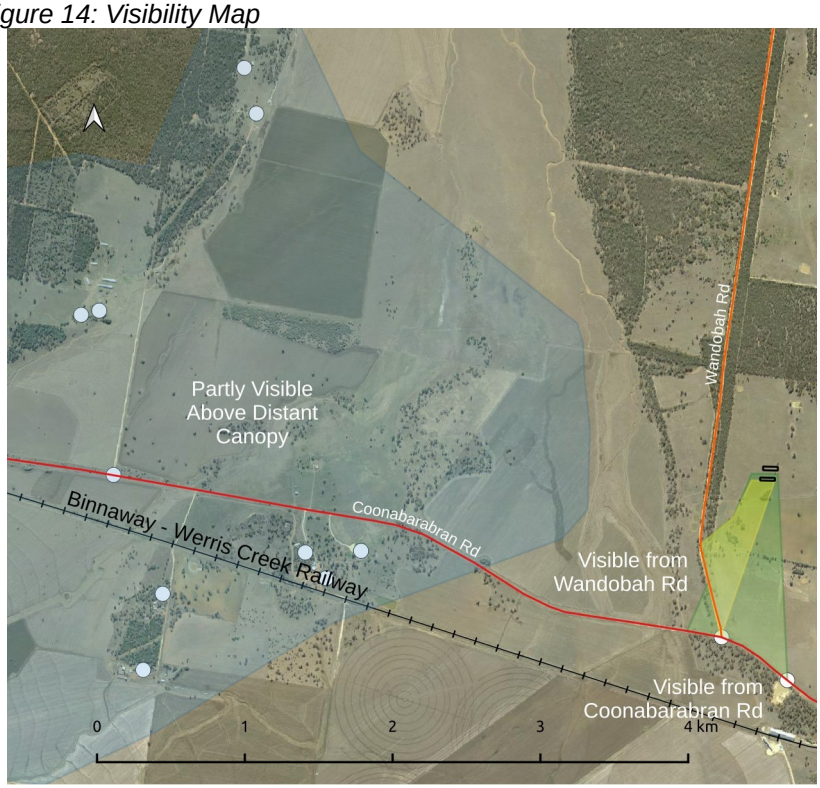
Appendix F - Visual Impact Assessment

The vegetation cover and topology in the vicinity of the proposed development will obscure it from ground level observers at many compass directions. It will not be visible from the east due to the terrain and will not be visible from the north due to vegetation.

From the west it will not be visible from much of Wandobah Road because of the vegetation on the road reserve, which is 12-15m high and 80m wide. As an observer moves further to the west, the top part of the Gin building and the top part of the Shed will progressively peep above the tree canopy in the distance The ground level improvements will always be obscured. From the nearest westerly house, some of the upper half of the buildings will be visible, more than 2.8km away. At houses off Tereala Rd, roughly the upper halves of the two buildings will be visible more than 4km away in the distance.

From the south for about a 500m section of Coonabarabran Road the building structures will be visible, 1.2 – 2 km away, in between trees. They will also be visible from the first part of Wandobah Rd, up to 650 m from its intersection with Coonabarabran Road, again with some tree obstructions. The closest view point on this section of Wandobah Road would be about 750m away from the buildings. At the south there are no residences or other places where people would remain at observation locations.
The locations where some of the development could be seen are shaded in Figure 14.

Figure 14: Visibility Map



From the vantage points west of the development, the visible top part of the 25m wide western facades of the Gin and Shed buildings will not be very prominent, due to the distances involved.
For travellers on Coonabarabran Road south of the development, other structures in the vicinity will be more prominent than intermittant views of the southern facades of the development's buildings 1.2km away.
The proponent believes any visual impact of the proposed development will be acceptable.

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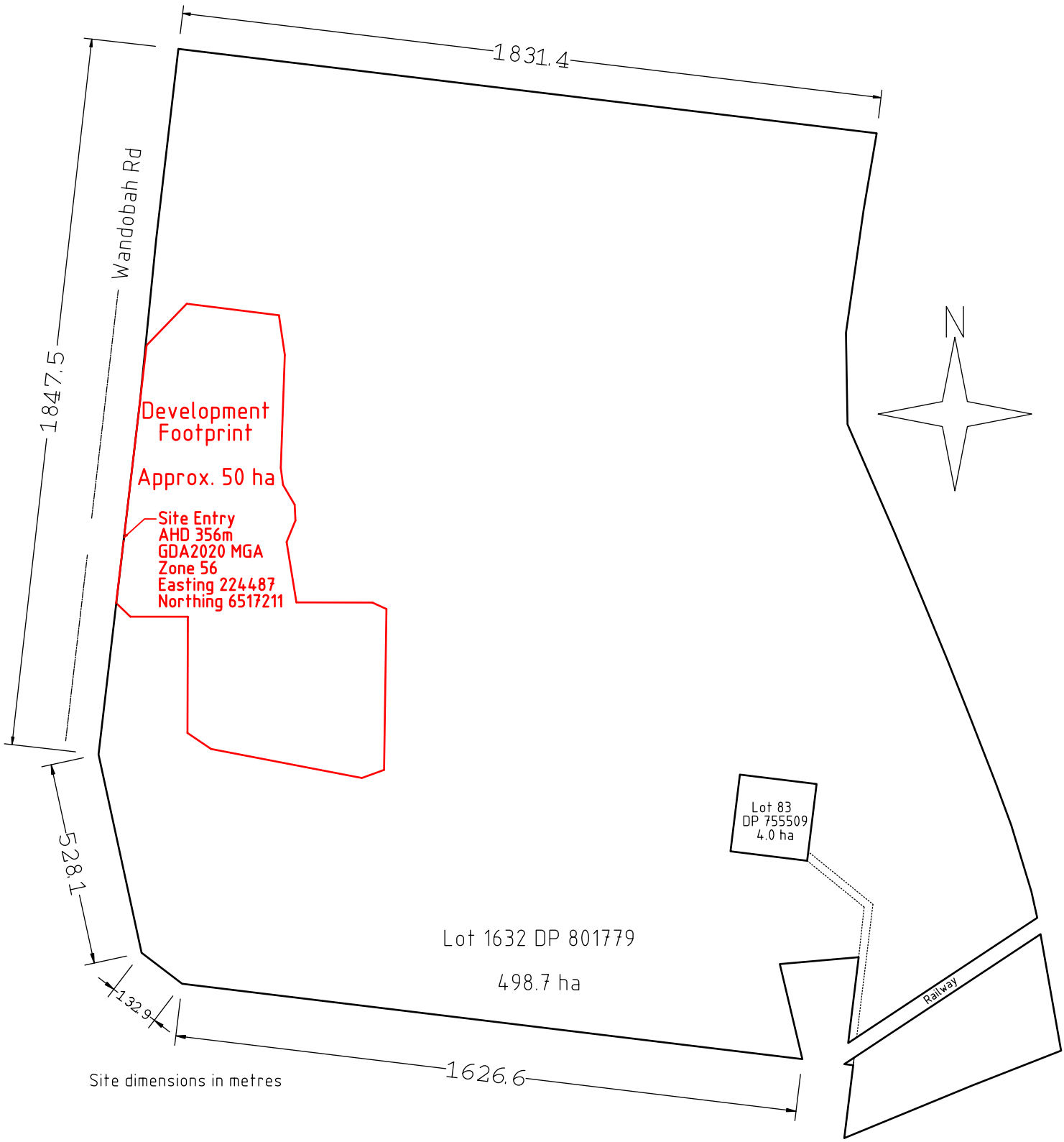
Attachment I Drawings

Drawing Title

Site Location – Wandobah Rd Yannergee
Locations of Project Stages
Plan - North Module Storage Stage
Plan - Crossover
Plan – Shed Stage
Plan - Gin Stage
Plan - South Module Storage Stage
Project Elevations by Stage
Shed
Office & Amenities Building
Gin Building
Workshop / Store
Plan- Fire Separation Distances
Plan – Project Overview - All Stages
Plan – Site Fall & Drainage Direction



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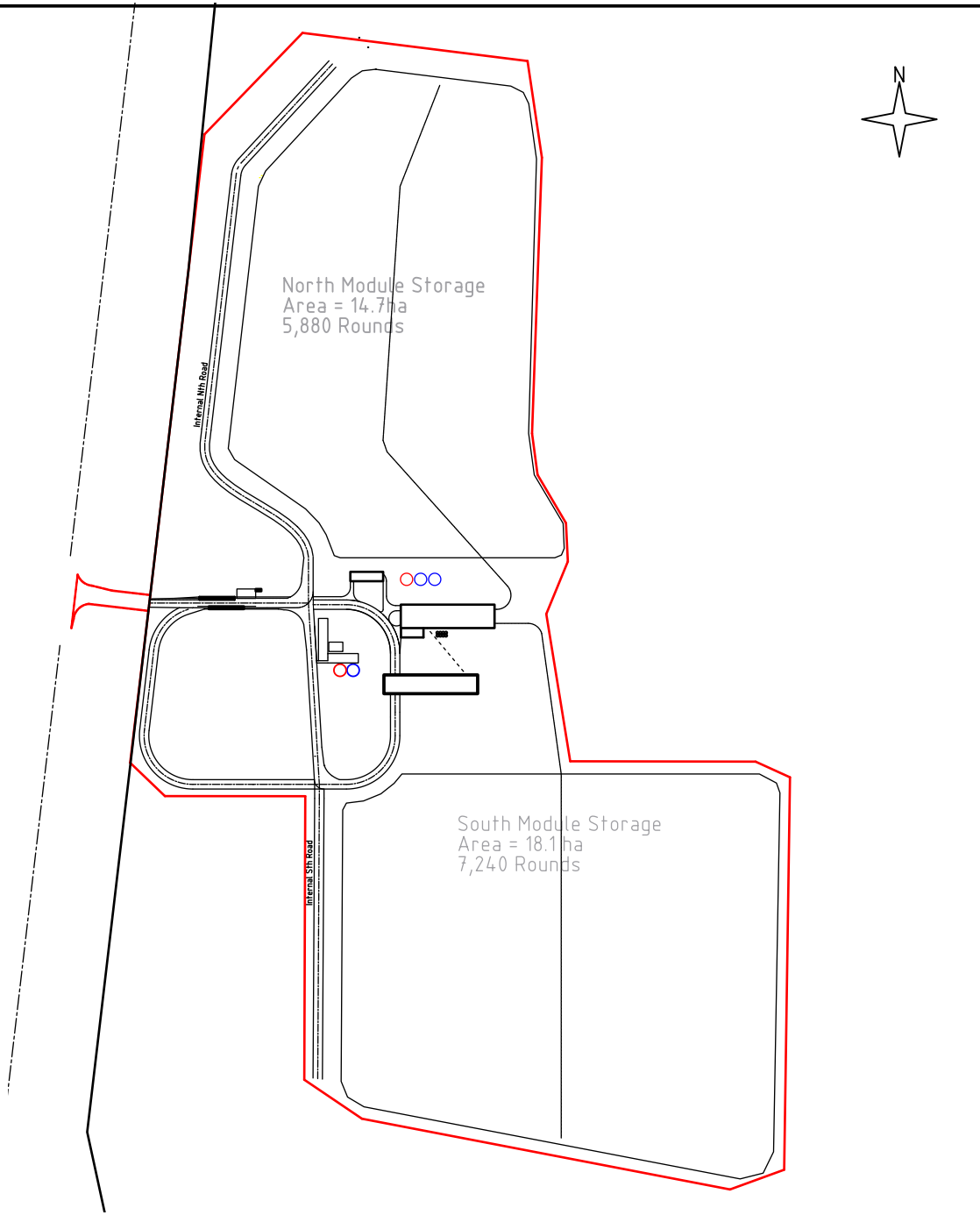

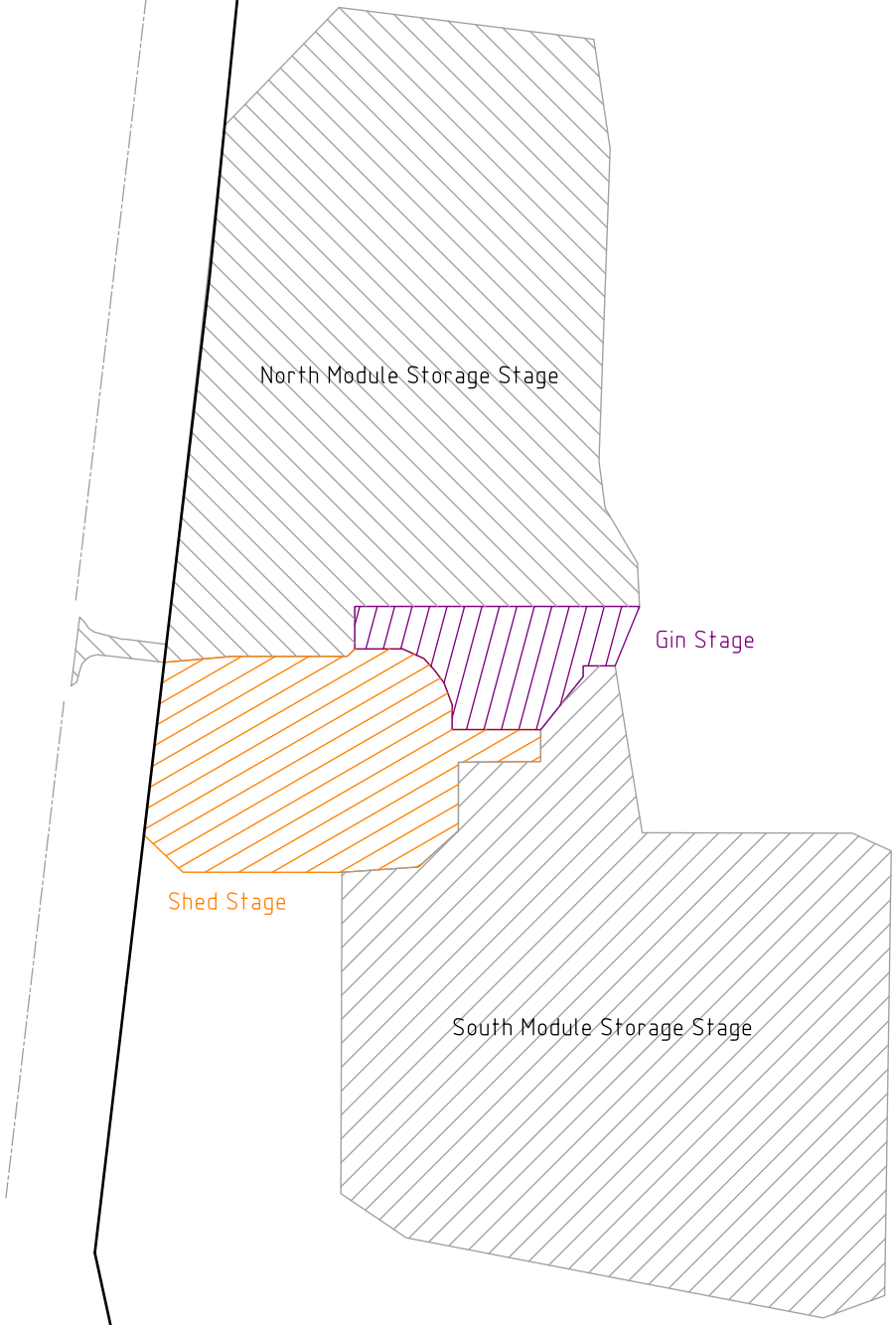

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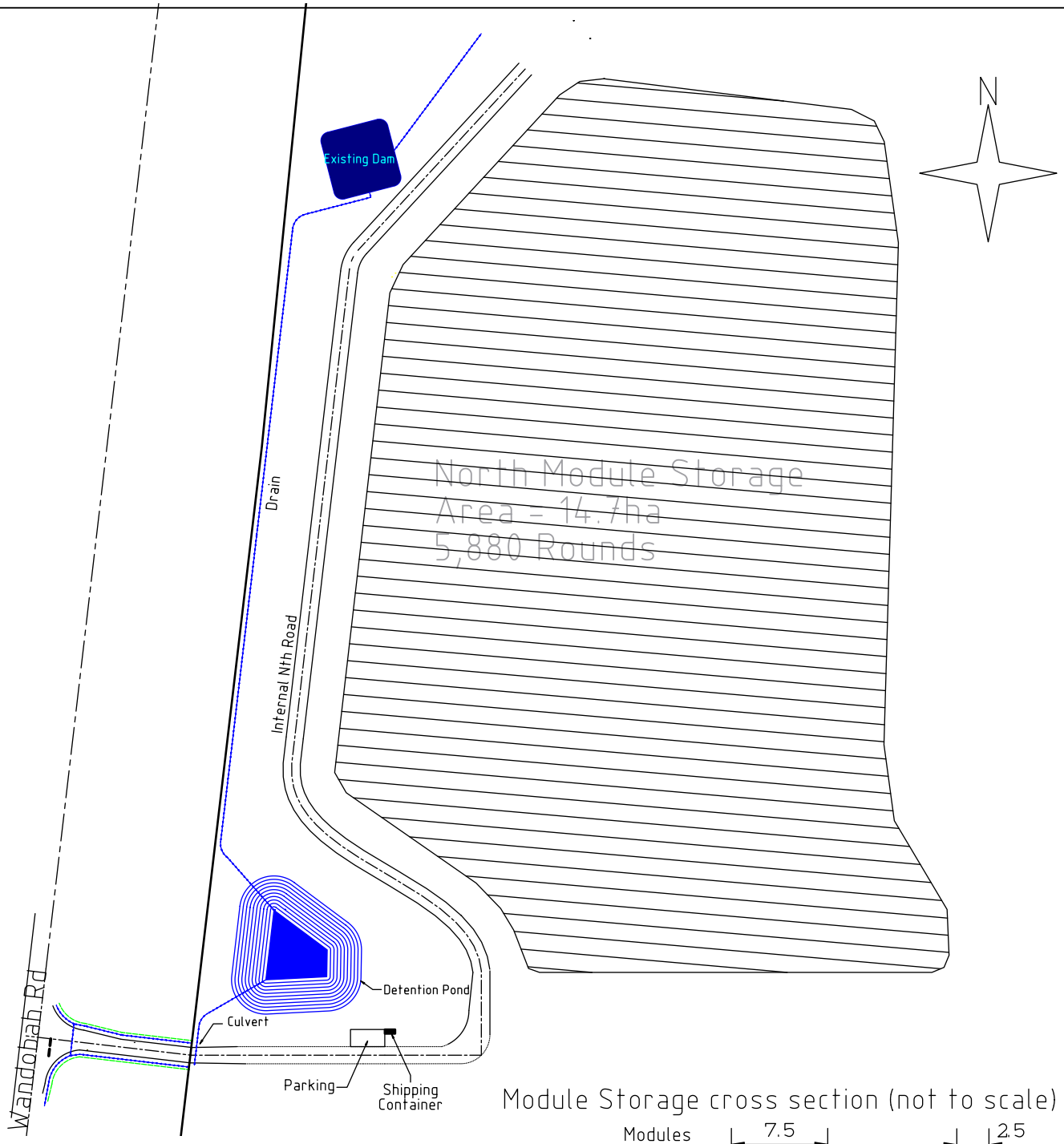
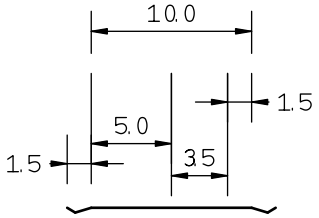
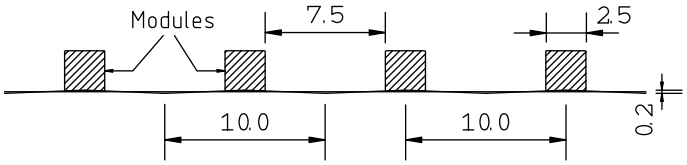


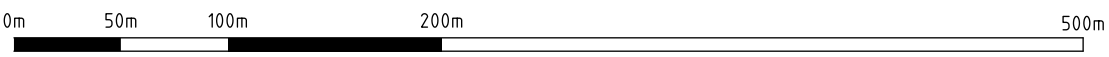
Internal Road
profile (not to scale)



Module Storage cross section (not to scale)



Setback from Wandobah Rd Boundary
Shipping Container / Site Hut: 110.9m



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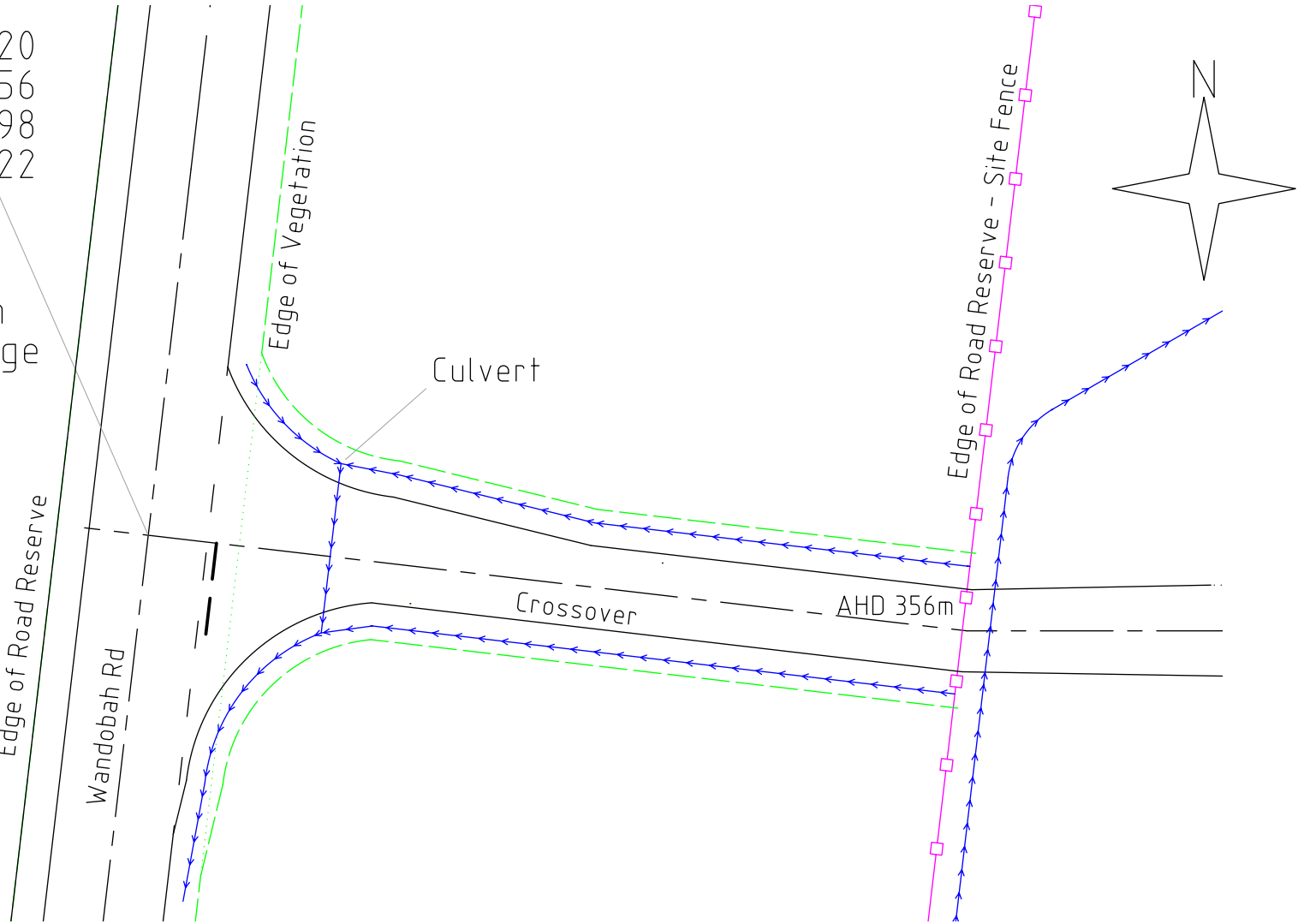
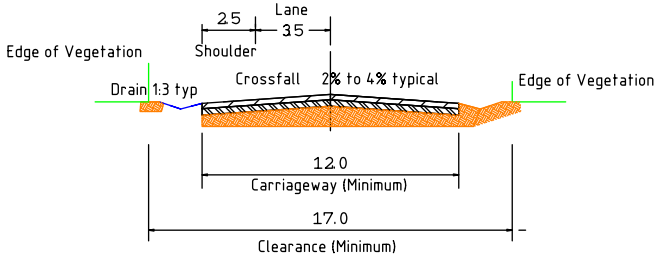
GDA2020
MGA Zone 56
Easting 224398
Northing 6517222

Crossover is included in
Nth Module Storage Stage



Crossover Typical Pavement cross section (not to scale)



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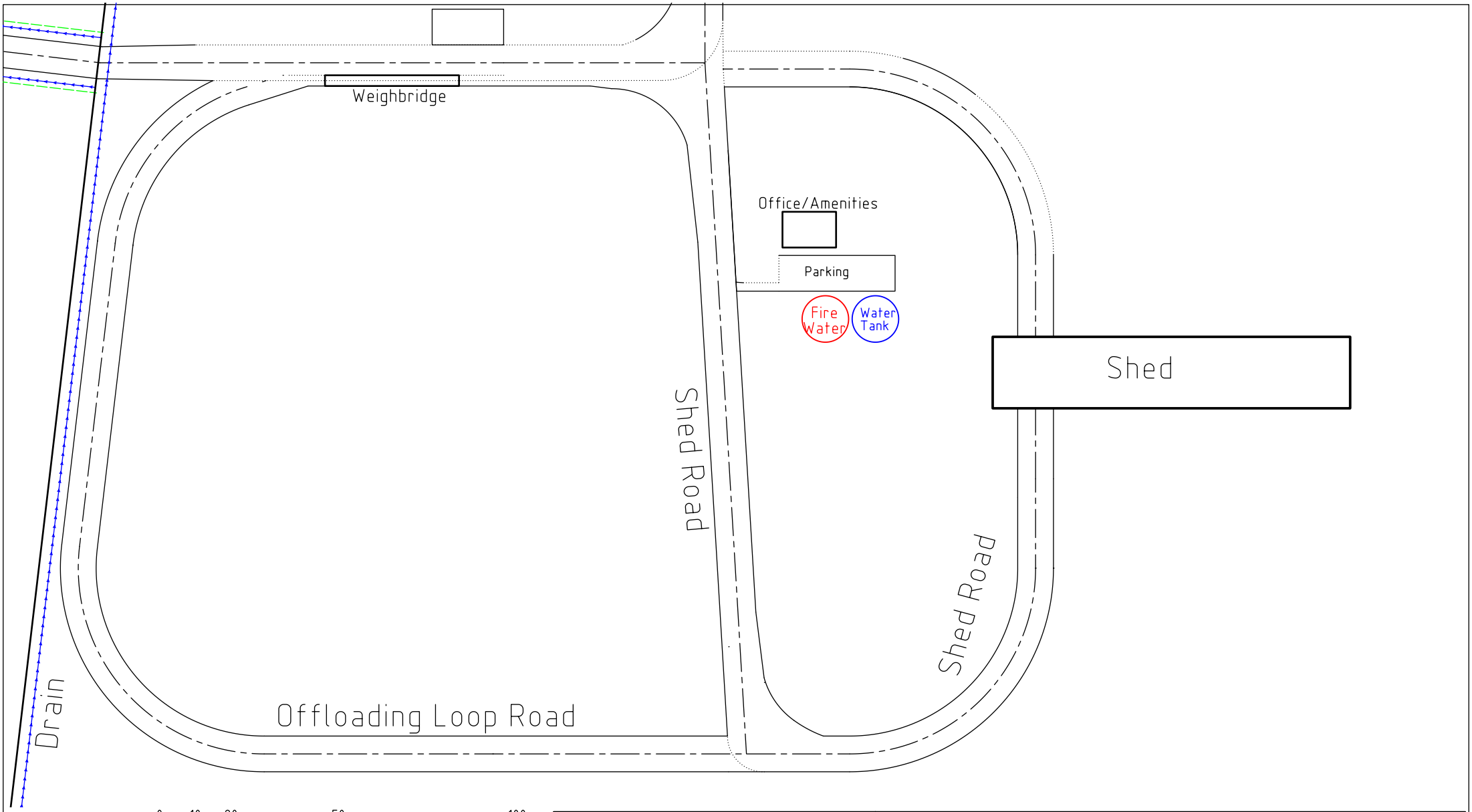

0m 10m 20m 50m 100m

N

Setbacks from Wandobah Road
Shed: 257.4m
Office Amenities: 195.0m

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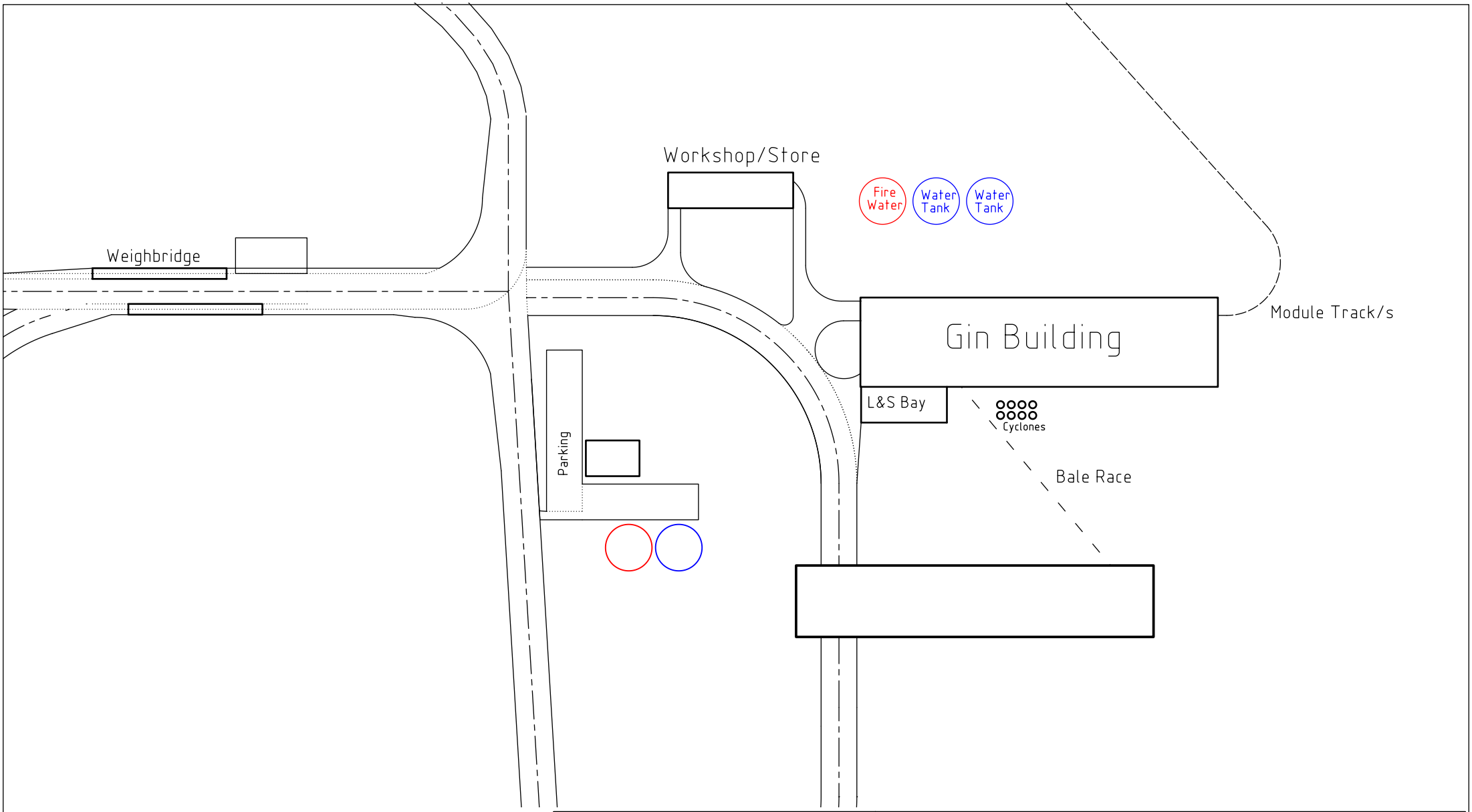

N

0m 10m 20m 50m 100m

Setbacks from Wandobah Road
Gin Building: 266.6m
Workshop Store: 209.0m

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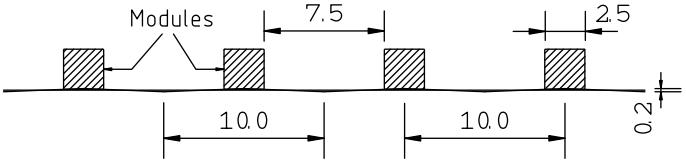
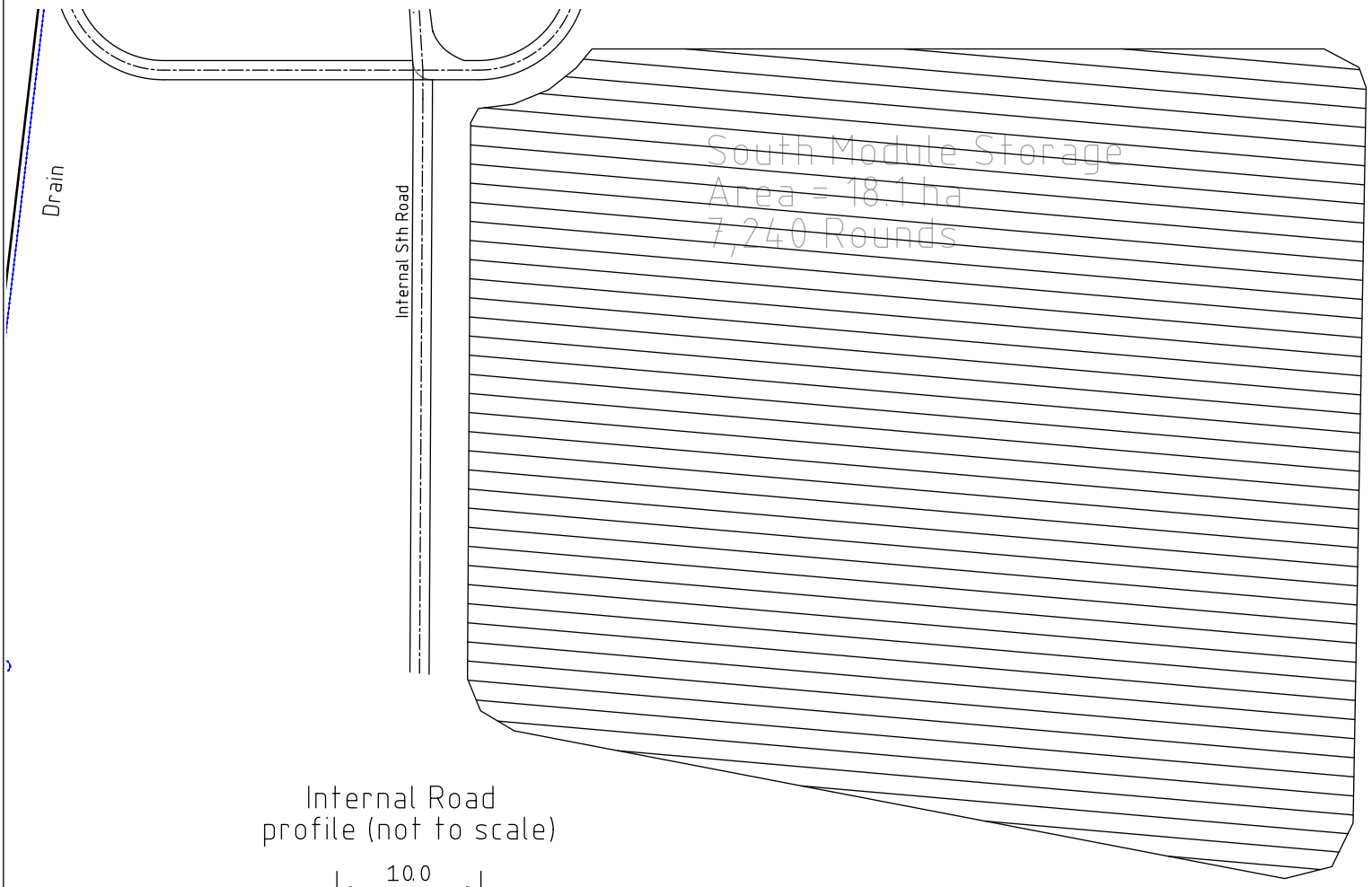
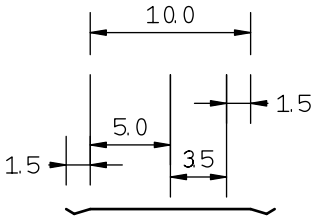
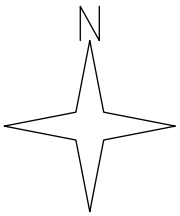
Module Storage cross section (not to scale)

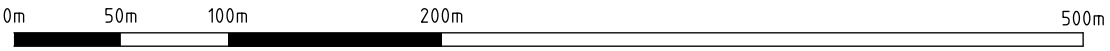




Internal Road profile (not to scale)







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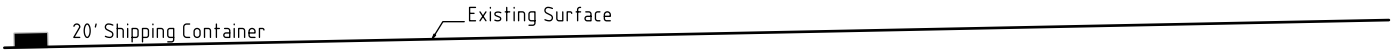
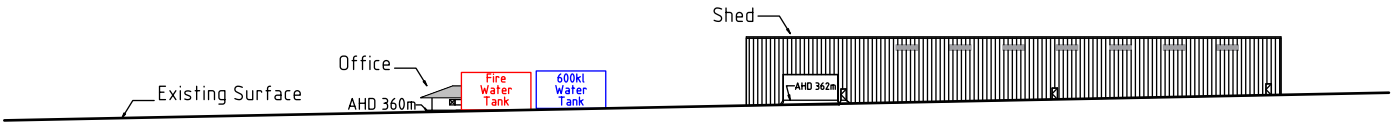
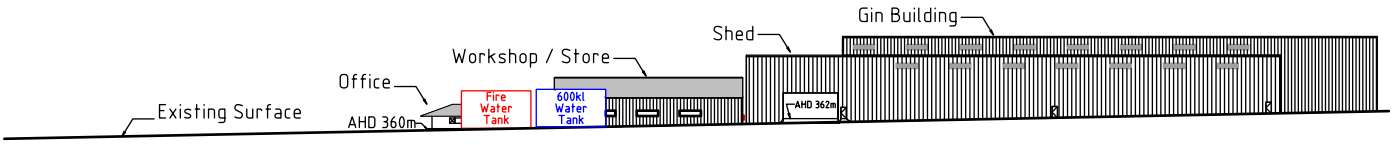


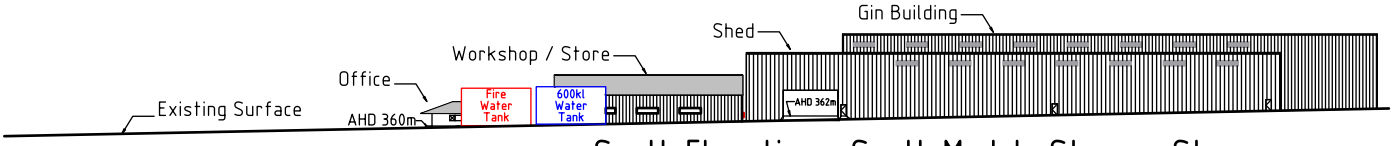
South Elevation - North Module Storage Stage



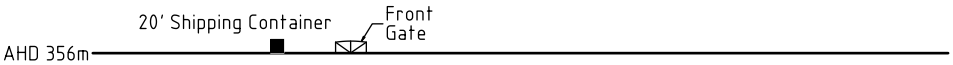
South Elevation - Shed Stage



South Elevation - Gin Stage



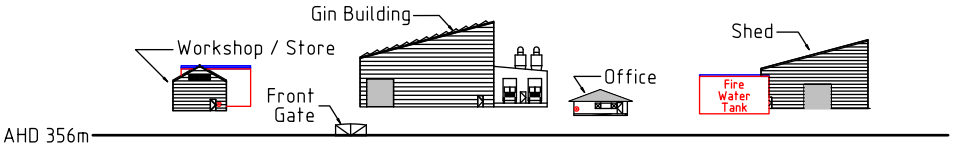
South Elevation - South Module Storage Stage



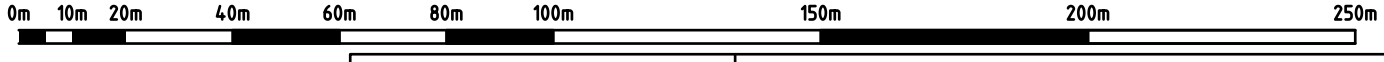
West Elevation - North Module Storage Stage

West Elevation - Shed Stage

West Elevation - Gin Stage



West Elevation - South Module Storage Stage



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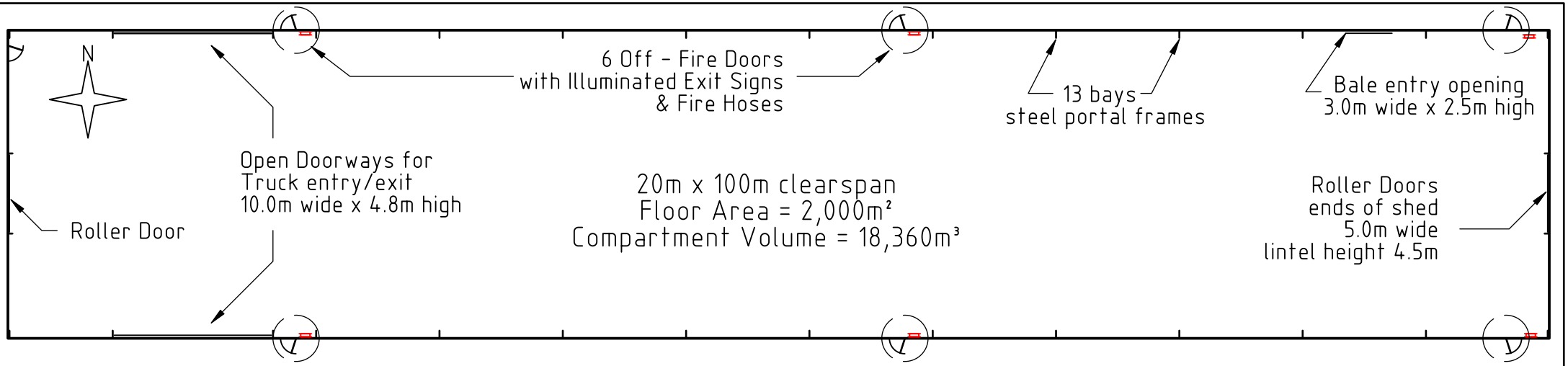
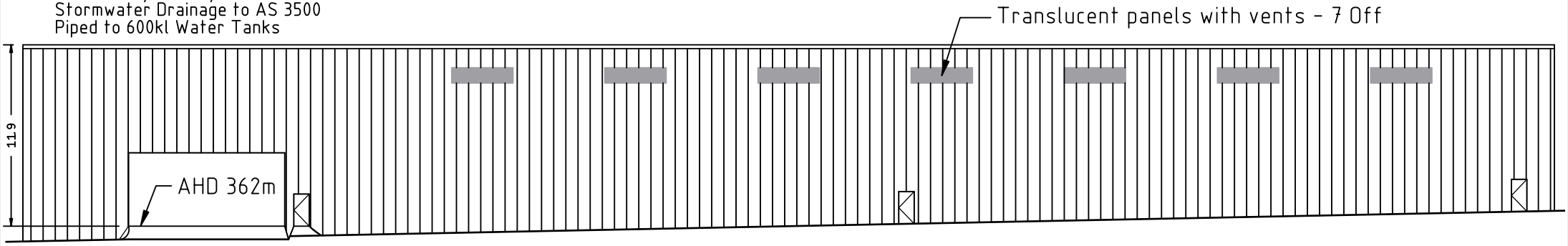
Approved By: Not for Construction	**Title :** Project Elevations by Stage			

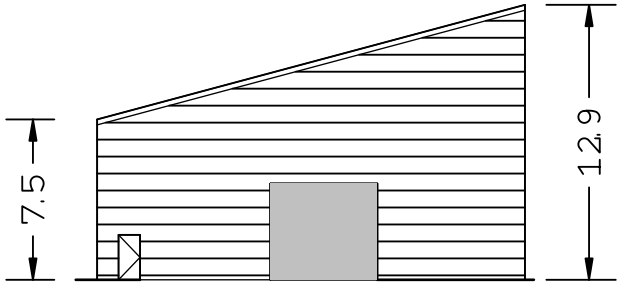


Floor Plan

Roof Catchment 2,000m²
IFD: 15.6mm, 2%AEP, 5min
Stormwater Drainage to AS 3500
Piped to 600kl Water Tanks



South Elevation



Shed - West Elevation

NCC Class 8 Building
Type C construction
Steel frame, metal clad, concrete floor

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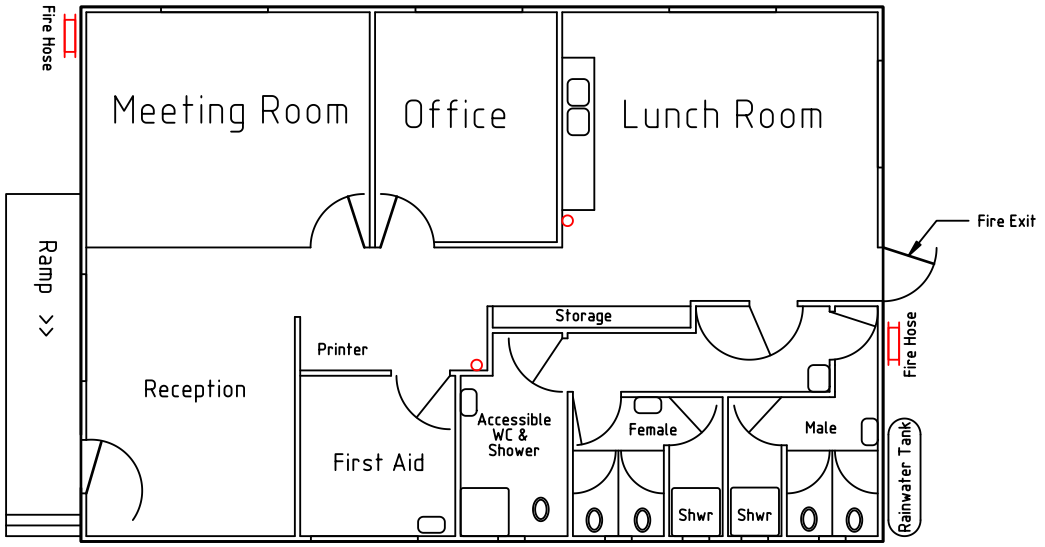
NCC Class 6 Building
10.0m x 15.0m

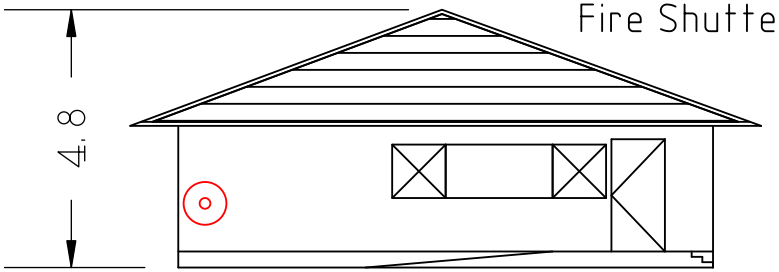
Roof Catchment 217m²
IFD: 15.6mm, 2%AEP, 5min
Stormwater Drainage to AS 3500
Surplus piped to 600kl Water Tanks



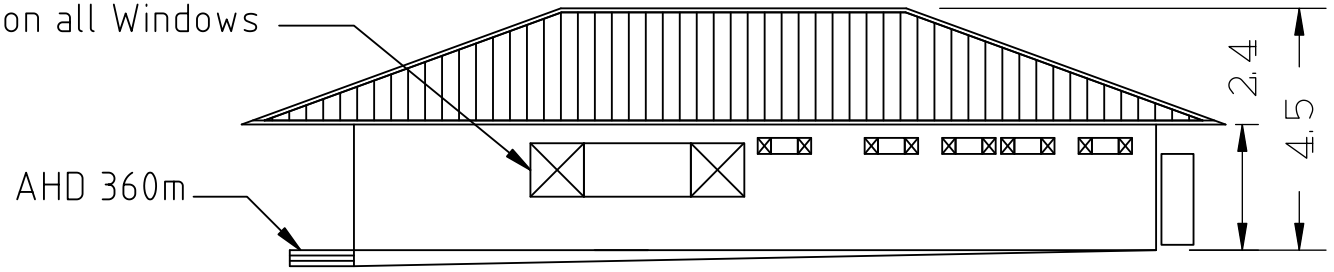
Floor Plan

Metal Roof
Cladding > BAL-12.5

Fire Shutters on all Windows



West Elevation



South Elevation

0 5m

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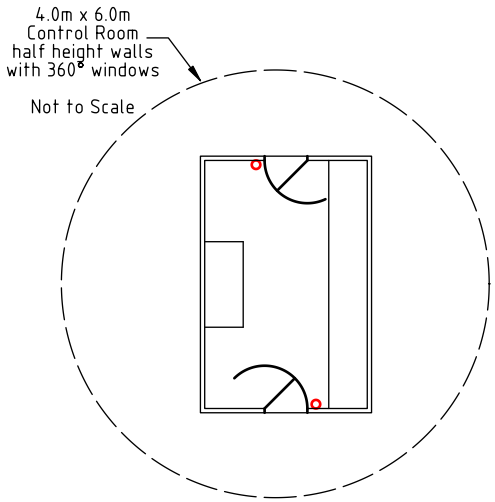
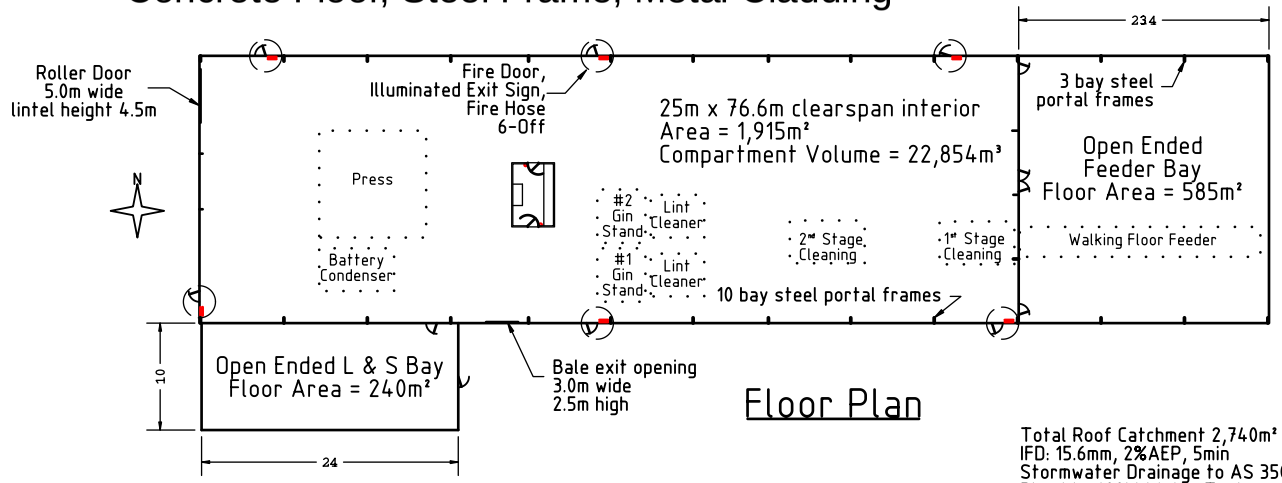
Approved By: Not for Construction	**Title :** Office & Amenities Building			

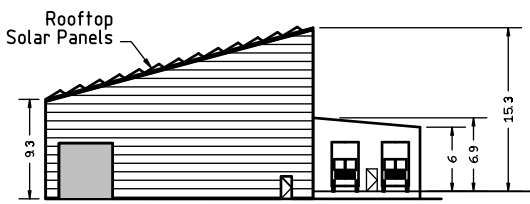
NCC Class 8 Building.
Type C construction
Concrete Floor, Steel Frame, Metal Cladding



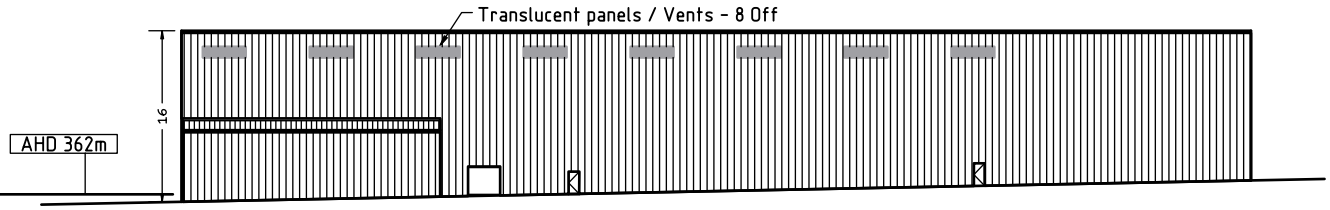


Floor Plan

Total Roof Catchment 2,740m²
IFD: 15.6mm, 2%AEP, 5min
Stormwater Drainage to AS 3500
Piped to 600kl Water Tanks



West Elevation



South Elevation

0 5m 10m 20m 50m

G J MEARES ABN 73 599 889 695 8 Delray Avenue Wahroonga NSW 2076 grant@meares.au phone 0419 228 247	**Drawing Filename:** 20221215AgriHubProject.dfx			
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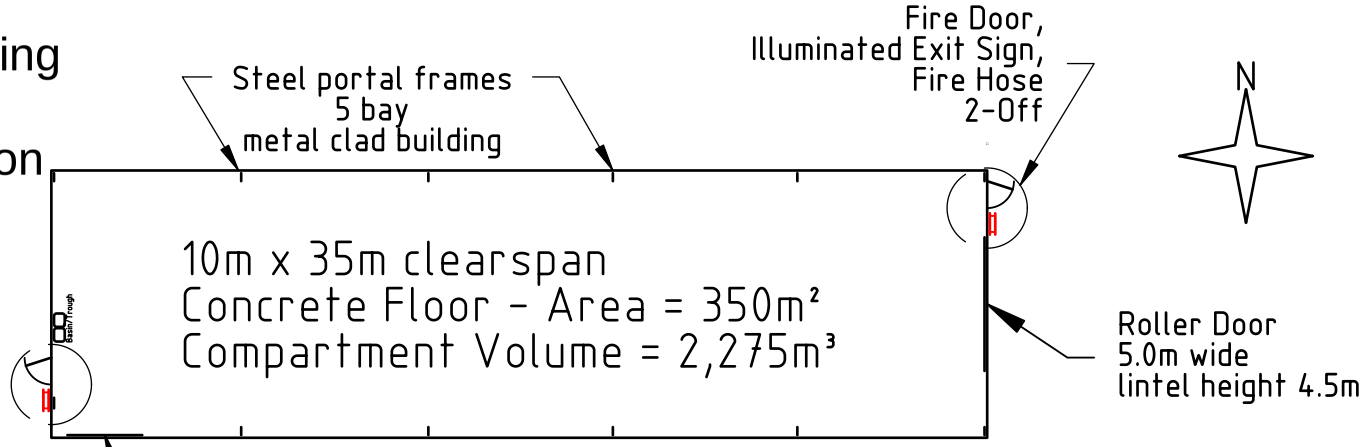
Designed By: Grant Meares	**Date:** 15 Dec 2022	**Revision:** 0.0	**Scale:** 1:500	**Sheet Size:** ISO A3
Approved By: Not for Construction	**Title :** Gin Building			

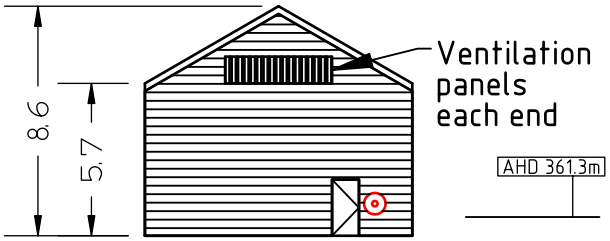
NCC Class 8 Building
10.0m x 35.0m
Type C construction



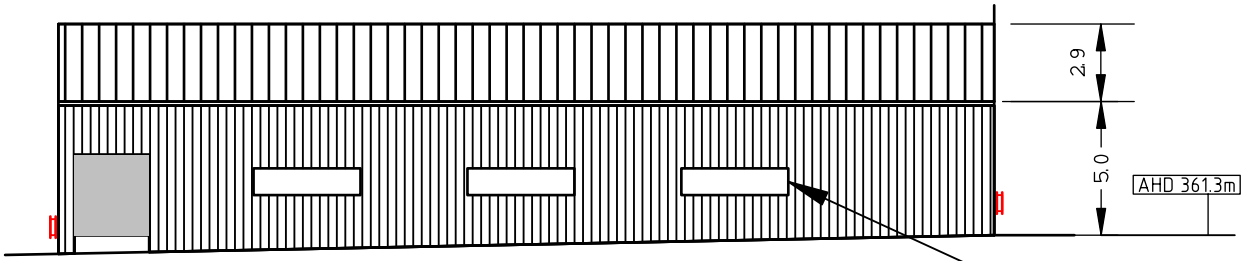
Roof Catchment 350m²
IFD: 15.6mm, 2%AEP, 5min
Stormwater Drainage to AS 3500
Piped to 600kl Water Tanks

Floor Plan

30° Gable metal roof



West Elevation



South Elevation

5m 10m

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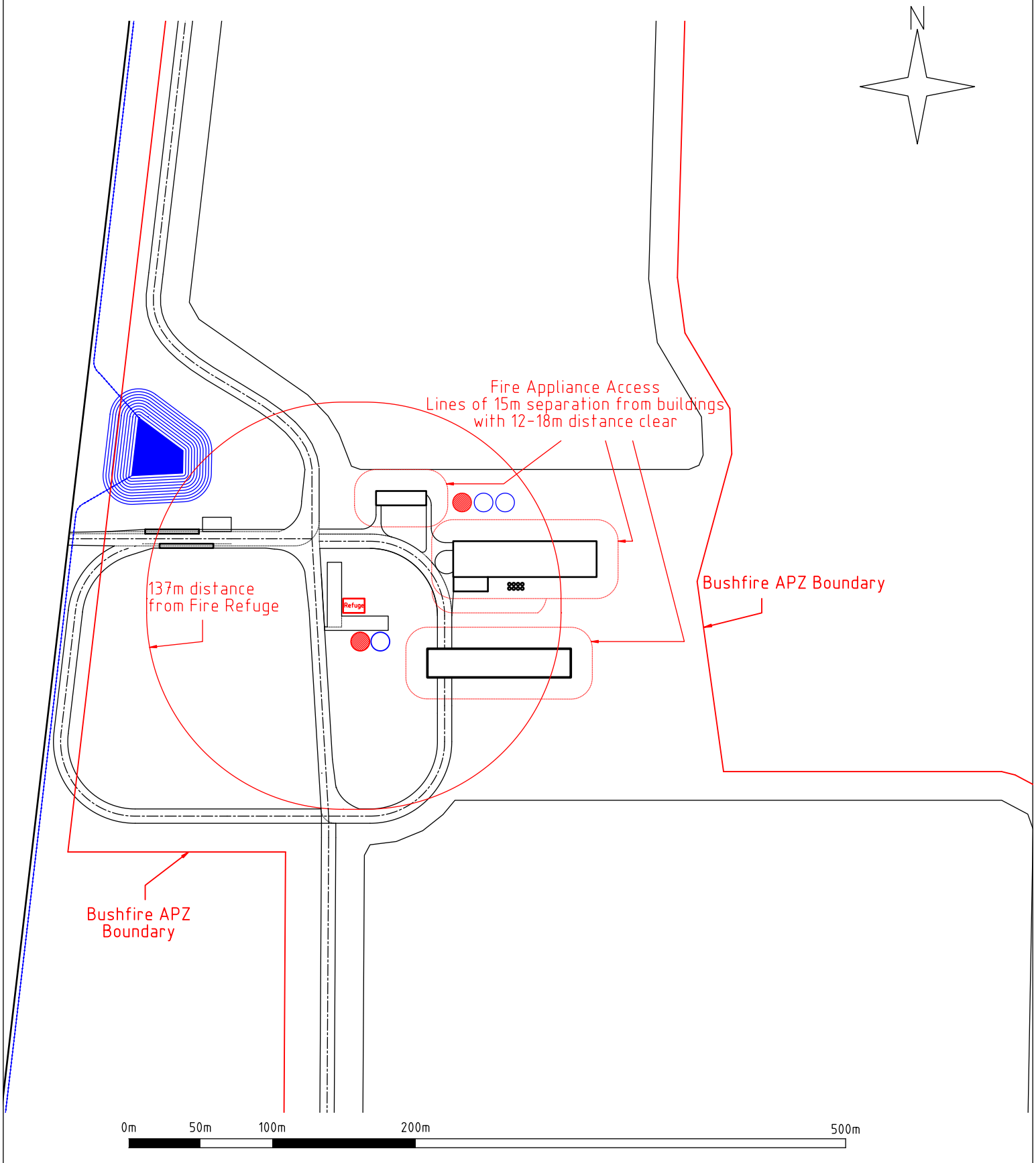
Approved By: Not for Construction	Title : Workshop / Store			



G J MEARES
ABN 73 599 889 695
8 Delray Avenue Wahroonga NSW 2076
grant@meares.au phone 0419 228 247

Drawing Filename: 20221215AgriHubProject.dfx				
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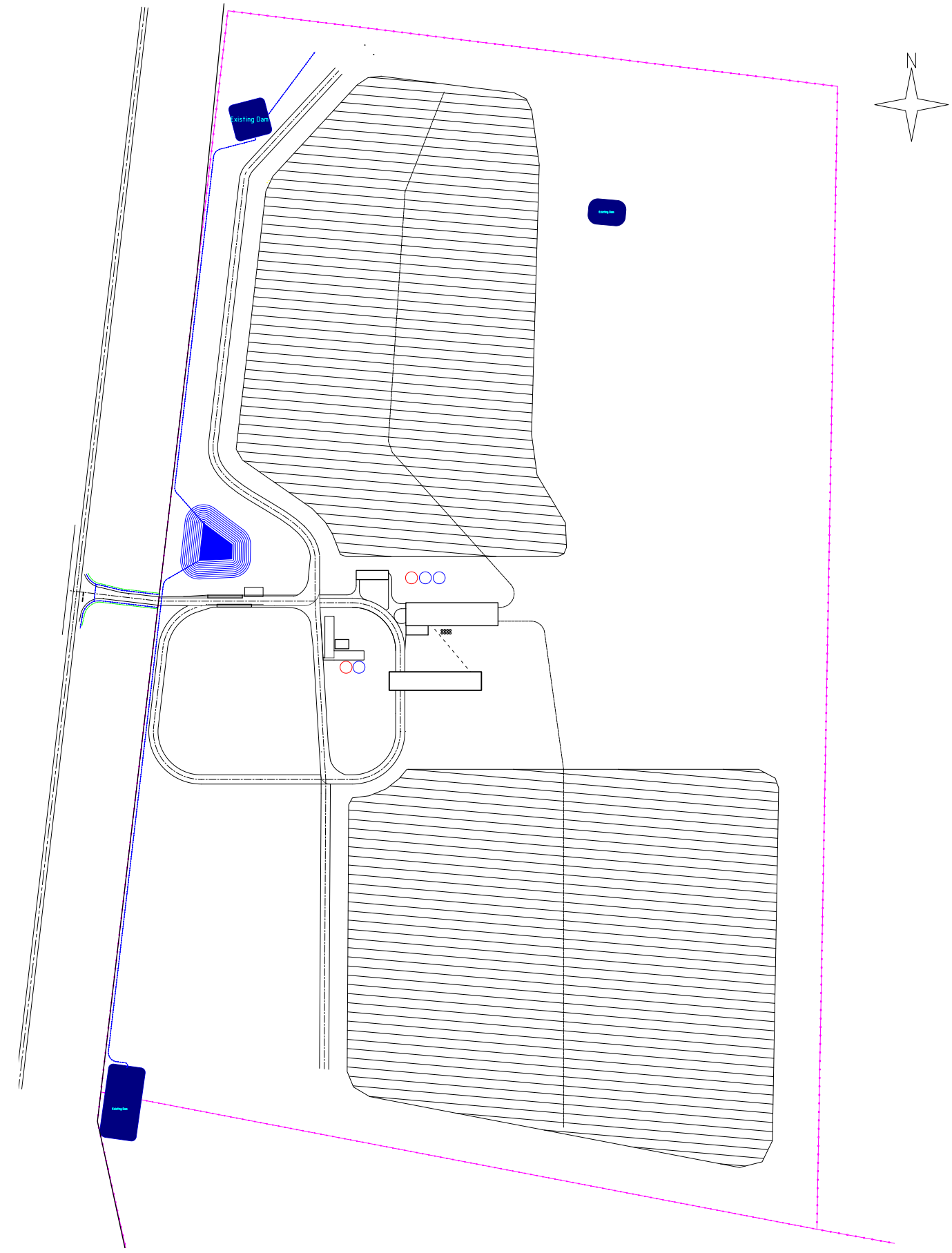

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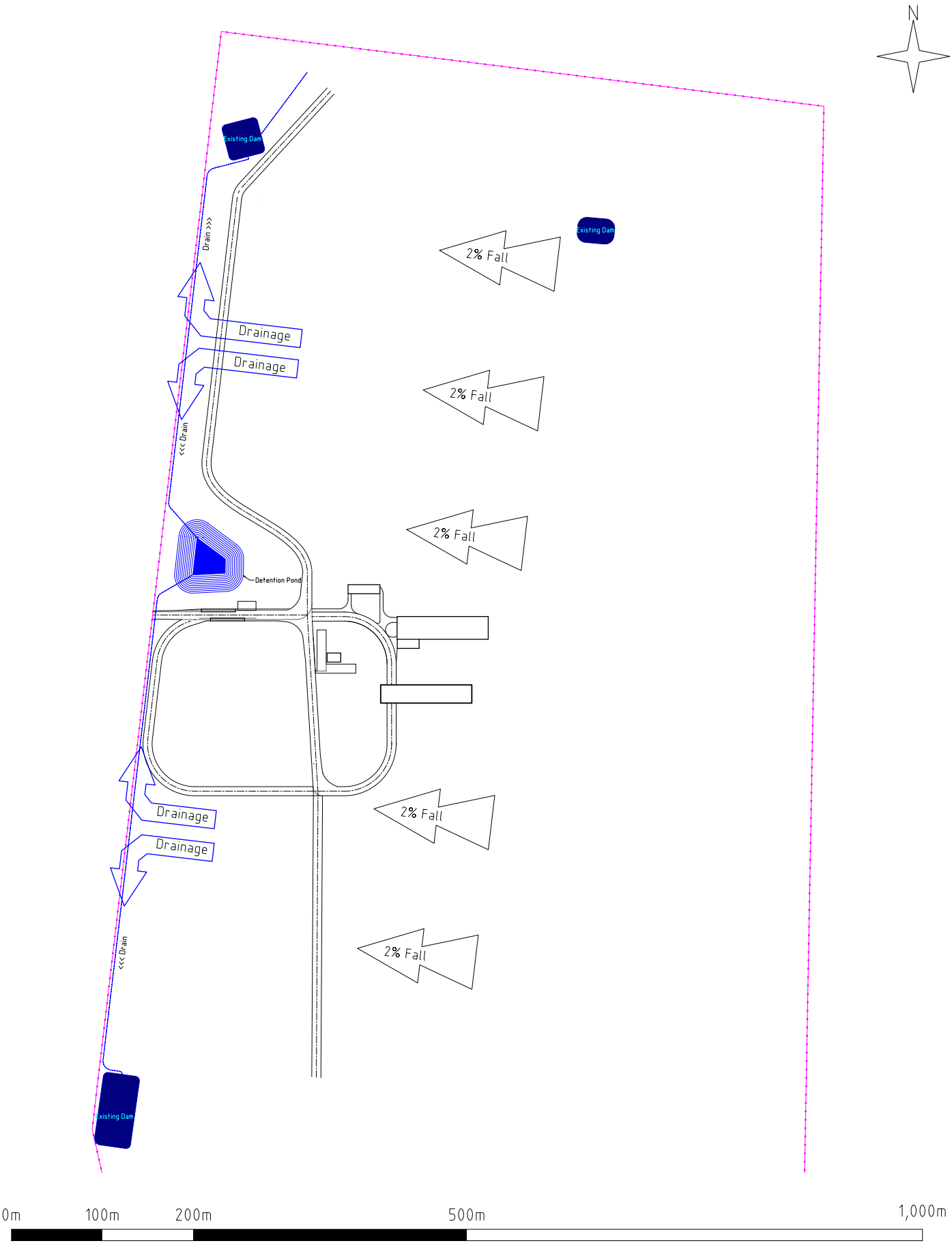
Designed By: Grant Meares	Date: 15 Dec 2022	Revision: 0.0	Scale: 1:2000	Sheet Size: ISO A1
Approved By: Not for Construction	Title : Plan - Project Overview - All Stages			



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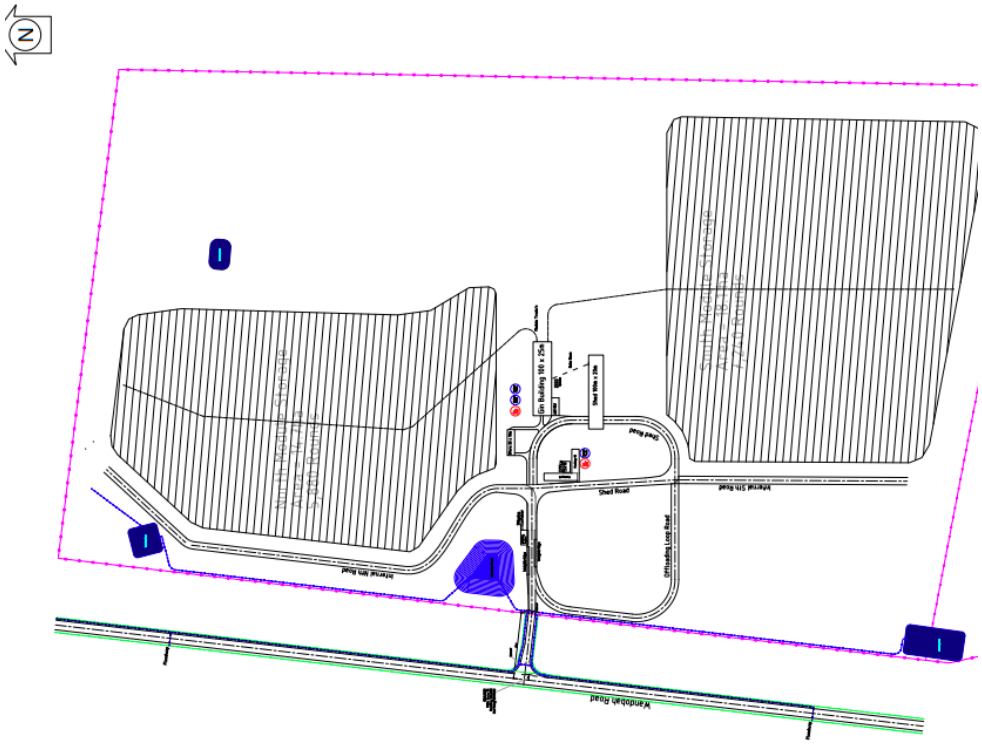
Designed By: Grant Meares	Date: 15 Dec 2022	Revision: 0.0	Scale: 1:2000	Sheet Size: ISO A1
Approved By: Not for Construction	Title : Plan - Site Fall & Drainage Direction			

LINDSAY DOYLE
& ASSOCIATES PTY LTD
QUANTITY SURVEYING & BUILDING CONSULTANCY

Quantity Surveying Certificate

for the Section 7.12 Infrastructure

Contributions for the Liverpool Plains Shire Council



Proposed Cotton Gin Lot 1632 DP801779, No 5387 Coonabarabran Road Yannergee NSW 2343 for Agri Hub Pty Ltd

Dated of the Report 15 September 2022

Renecourt, 3269 Oxley Highway West
Bective, NSW 2340

Ph: (02) 6769 7523
Mob: 0447 697 523
Fax: (02) 6769 7527
www.lindsaydoyle.com.au

Email: lindsay@lindsaydoyle.com.au

LINDSAY DOYLE
& ASSOCIATES PTY LTD
QUANTITY SURVEYING & BUILDING CONSULTANCY

15 September 2022

The Managing Director
Agri Hub Pty Ltd

Dear Sir,

Section 7.12 Infrastructure Development Contributions for the Proposed Cotton Gin at Lot 1632 DP 801779, 5387 Coonabarabran Road Yannergee NSW 2343

Lindsay Doyle and Associates Pty Ltd have reviewed the plans supplied for the construction of the proposed development for the above property.

The estimated construction cost of the Proposed Cotton Gin and associated works as detailed in the body of this report is $15,338,105 GST Inclusive.

If you require further information please do not hesitate to contact me.

Yours sincerely

Lindsay Doyle
Bachelor of Building UNSW
Australian Institute of Quantity Surveyors (No. 10336)

Renecourt, 3269 Oxley Highway West
Bective, NSW 2340
Ph: (02) 6769 7523
Mob: 0447 697 523
Fax: (02) 6769 7527
www.lindsaydoyle.com.au
Email: lindsay@lindsaydoyle.com.au

TABLE OF CONTENTS

1. Instruction

Lindsay Doyle and Associates Pty Ltd have received an instruction from Agr Hub Pty Ltd to prepare the development costs for the Proposed Cotton Gin at Lot 1632 DP 801779 No 5387 Coonabarabran Road Yannergee NSW 2343 to calculate the Section S 7.12 Indirect Development Contributions.

2. Site Location and Services

The site is located at Lot 1632 DP 801779, No 5387 Coonabarabran Road Yannergee NSW 2343

3. Plans

I have inspected the plans that will be used for the Development Application.

The plans are for the purposes of submitting a Development Application and are not for construction.

4. Development Description

The development consist of the following

- North Module Storage 14.7 Hectares and associated road works and drainage.
- South Module Storage 18.1 Hectares and associated road works and drainage.
- Gin Building 2,500 square metres and associated road works.
- Shed Building 2,000 square metres
- Store Building 350 square metres
- Office Building
- Two Weigh Bridges
- Water Storage Facilities for the site operations and firefighting.

5. Qualifications

1. The report is not to be relied upon by any other person or for any other purpose except for being used to calculate the Section 7.12 Infrastructure Contributions for the Liverpool Plains Shire Council.
2. This cost assessment is current at the date of assessment only, and it is advisable that the assessment be reviewed at regular intervals.
3. I draw your attention to the various qualifications contained within relevant sections of this report.

6. Development Costing

This assessment has been prepared on specific instructions from Agri Hub Pty Ltd.

I confirm that I have reviewed the development plans in preparing this report.

I declare that there is no existing or contemplated pecuniary interest or conflict of interest between those preparing this report and any other party who may have an interest in relation to this property.

I have no direct, indirect or financial interest in the property described herein.

I certify that the Development Cost within the described property subject to terms and conditions contained within this report as at the 15 September 15, 2022.

The estimated construction cost of the Proposed Cotton Gin and associated works as detailed in the body of this report is $15,338,105 GST Inclusive.

Regards

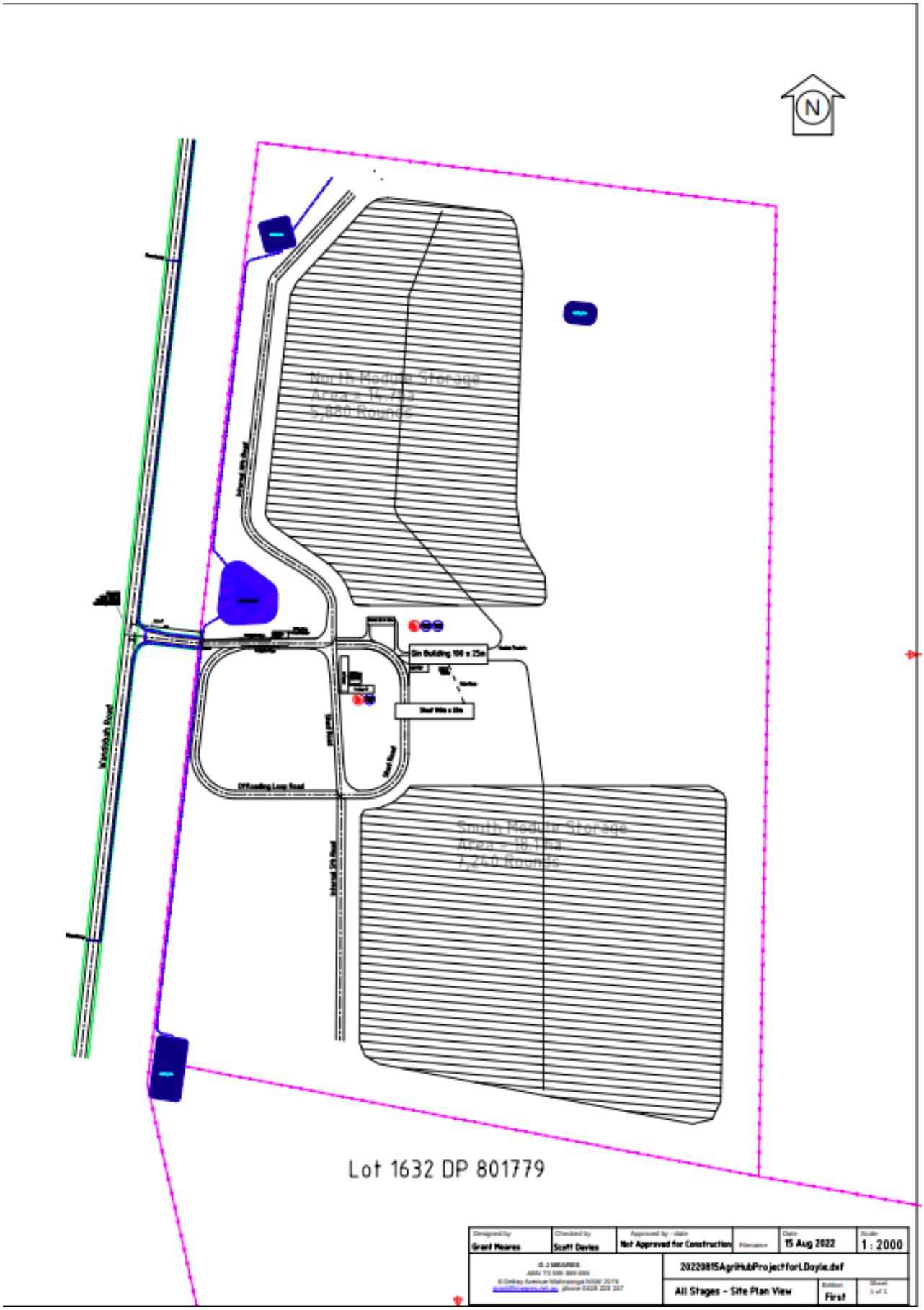
Lindsay Doyle
Bachelor of Building UNSW
Australian Institute of Quantity Surveyors No. 10336

ANNEXURE "A" Estimate

Estimate for Proposed Commercial Development Cotton Gin Lot 1632 DP 801779 5387 Coonabarabran Road Yannergee NSW 2343				
Item	**Quantity**	**Unit**	**Rate**	**Total**
Design Costs & Council Fees				
Drafting Design	1	Item	30,000	30,000
Traffic Reports	1	Item	5,000	5,000
Section J	1	Item	2,000	2,000
Geotech	1	Item	7,200	7,200
Structural design	1	Item	30,000	30,000
Civil design	1	Item	10,000	10,000
Electrical design	1	Item	25,000	25,000
Hydraulic & fire design	1	Item	12,000	12,000
Mechanical Design	1	Item	7,500	7,500
Surveying	1	Item	25,500	25,500
Sub Total				**154,200**
Preliminaries	**Quantity**	**Unit**	**Rate**	**Total**
Builders Site Sheds	52	Weeks	246	12,792
Site Toilets	52	Weeks	65	3,380
Site Security Chain Mesh Fence Permanent	The Site is fenced			
Site Supervisor	52	Weeks	4,500	234,000
Skip Bin Hire	52	Weeks	350	18,200
Sedimentation Control	1	Allowance	12,000	12,000
Power and Meter to the Building	1	No	4,000	4,000
Insurances Allowances	0.005	Item	14,700,000	77,910
Long Service Levies	0.008	Item	14,700,000	110,250
Sub Total				**472,532**
North Module Pad	**Quantity**	**Unit**	**Rate**	**Total**
Strip Top Soil	147,000	m2	0.2	29,400
Cut to Fill Module Pads	147,000	m2	1.5	220,500
Roads and Pavements	0.900	Km	33,000	29,700
Drainage and Retention Dam	1	No	32,000	32,000
Sub Total				**311,600**
Fencing	**Quantity**	**Unit**	**Rate**	**Total**
Existing Fencing Used				-
Gates	1	No	2,000	2,000
Sub Total				**2,000**

Shed and Weigh Bridges	**Quantity**	**Unit**	**Rate**	**Total**
Roads Associated with Shed	1.0	Km	33,000	33,000
5 Car Parking Spaces Gravel	10	No	1,000	10,000
Septic System	1	No	12,000	12,000
Shed	2,000	m2	1,100	2,200,000
Weighbridge	1	No	310,000	310,000
Water Tanks	2	No	150,000	300,000
Sub Total				**2,865,000**
Cotton Gin	**Quantity**	**Unit**	**Rate**	**Total**
Roads Associated With Shed	0.8	Km	33,000	26,400
5 Car Parking Spaces Gravel	5	No	1,000	5,000
Shed	2,500	m2	1,100	2,750,000
Store	350	m2	1,400	490,000
Leaf and Stick Bay	240	m2	1,400	336,000
Weighbridge	1	No	300,000	300,000
Water Tanks	3	No	150,000	450,000
Gin Fit Out Electrical	1	No	1,800,000	1,800,000
Gin Fit Out Mechanical	1	No	1,800,000	1,800,000
Gin Equipment Relocation	1	no	1,800,000	1,800,000
Sub Total				**9,757,400**
South Module	**Quantity**	**Unit**	**Rate**	**Total**
Strip Top Soil	181,000	m2	0.20	36,200
Cut to Fil Module Pads	181,000	m2	1.5	271,500
Roads and Pavements	0.900	Km	33,000	29,700
Drainage Works	1	No	3,600	3,600
Sub Total				**341,000**
Signage				
Signage	1	Item	5,000	5,000
Sub Total				**5,000**
Landscaping Allowance				
Allowance for Landscaping	1	Item	35,000	35,000
Sub Total				**35,000**
Sub Total				**13,943,732**
Total GST Exclusive				**13,943,732**
GST			10%	1,394,373
Total GST Inclusive				**15,338,105**

ANNEXURE "B" The Plan


N
North Module Storage
Area = 14.4ha
5,880 Rounds
South Module Storage
Area = 18.1ha
7,260 Rounds
Lot 1632 DP 801779
Grant Meares
Scott Davies
Not Approved for Construction
15 Aug 2022
1 : 2000
20220815AgriHubProjectforLDoyle.dwf
All Stages - Site Plan View
First

Biodiversity Assessment

Agri Hub cotton gin

Lot 1632 DP 801779, Wandobah Rd, Yannergee

220606_01

OFFICE
Stringybark Ecological Pty Ltd
3, 4-6 Moore St,
Armidale, NSW

T 0418 651 263
W stringybarkecological.com.au

ABN 26 650 630

Document

Biodiversity Assessment – Agri Hub cotton gin

Document ID: 220606_01

Version number: 2 (Final)

Document authors: David Carr and Claire Chepel

Field Data: Field data sheets, plant specimens and GPS data are stored at our office (address above).

Created

August 2022

Scientific licence for collection of specimens: SL102094

ECA ECOLOGICAL CONSULTANTS ASSOCIATION of NSW Inc
2022 PRACTISING MEMBER

CERP CERTIFIED ECOLOGICAL RESTORATION PRACTITIONER
BY THE SOCIETY FOR ECOLOGICAL RESTORATION
D. Carr #0370 Exp. 12/15/24

Executive summary

We have assessed possible impacts on biodiversity from the construction of a cotton gin on Wandobah Rd, Yannergee at Lot 1632 DP 801779. The impacts on biodiversity are covered by:

1. The Biodiversity Conservation Act, 2016 (NSW),
2. The State Environment Planning Policy (Biodiversity and Conservation) 2021, including the Koala Habitat Protection SEPP 2020, and
3. The Environment Protection and Biodiversity Conservation Act, 1999 (Commonwealth).

As a result of our surveys and assessment we have found that:

1. The project does not trigger the Biodiversity Offsets Scheme so a Biodiversity Development Assessment Report (BDAR) is not required.
2. A Koala Plan of Management is not required as the site is not in potential koala habitat due to koala food trees not being present.
3. No Commonwealth Matters of National Environmental Significance will be significantly impacted, so a referral to the Commonwealth Minister for the Environment is not required.

Contents

Tables

Figures

Appendices

1 Introduction

Stringybark Ecological have been engaged by Agri Hub Pty Ltd to assess possible impacts on biodiversity from the construction of a cotton gin on Wandobah Rd, Yannergee at Lot 1632 DP 801779 (Fig. 1). The impacts on biodiversity are covered by:

1. The Biodiversity Conservation Act, 2016 (NSW),
2. The State Environment Planning Policy (Biodiversity and Conservation) 2021, including the Koala Habitat Protection SEPP 2020, and
3. The Environment Protection and Biodiversity Conservation Act, 1999 (Commonwealth).

Under the Biodiversity Conservation Act 2016, a development proposed under the Environment Planning and Assessment Act (1979), must consider the impact of the development on threatened species and ecological communities. Under Part 4 of the EPA Act, Council, as the consent authority, must be satisfied that the development will not have an impact on the environment, as specified in the Act, or that the impacts have been avoided, minimised, mitigated or offset.

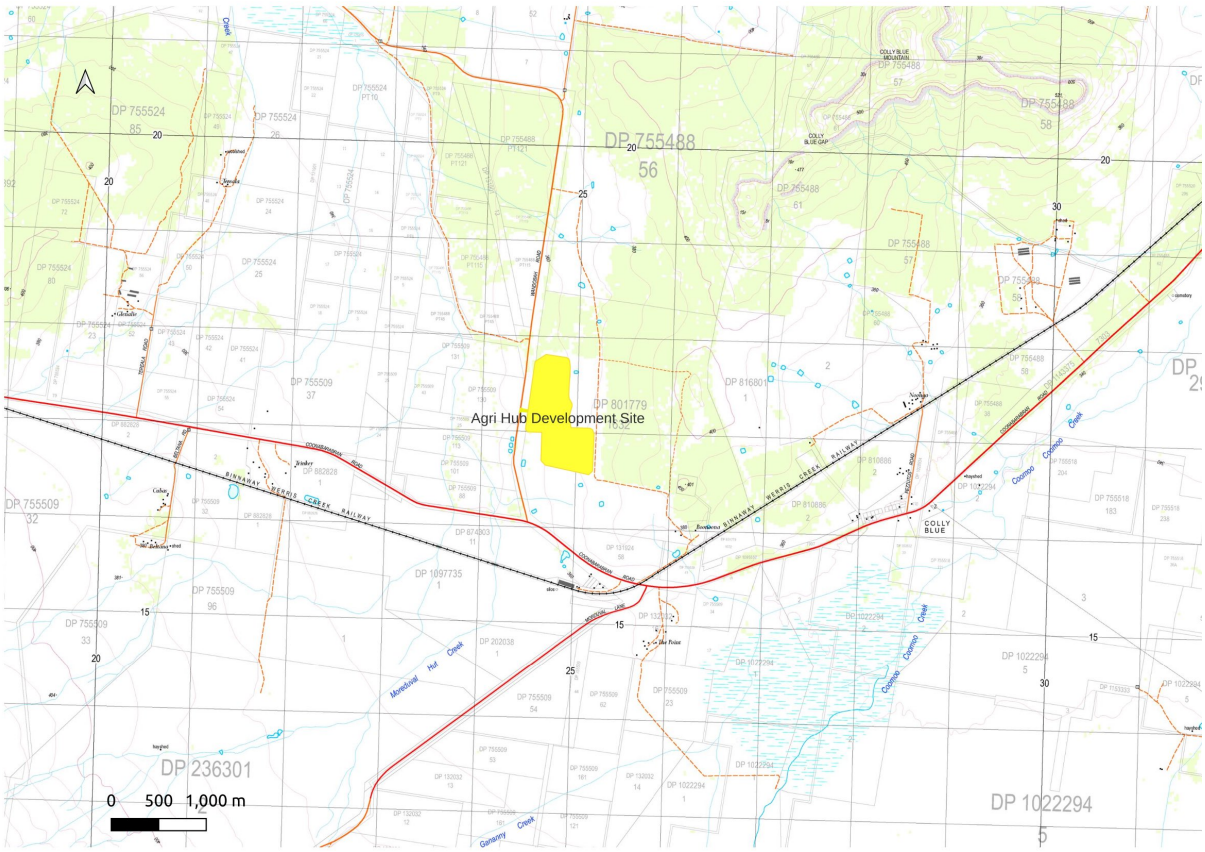


Figure 1: Location of the development site

On 1st September, 2021 Stringybark Ecological inspected the site of the proposed development and undertook preliminary field work to determine what environmental assessments are required.

The Biodiversity Conservation Act (2016) has three thresholds to determine whether the Biodiversity Assessment Method (BAM) must be applied. These thresholds are:

1) Whether the amount of native vegetation being cleared exceeds an area threshold;

2) Whether the impacts occur on an area of land mapped on the Biodiversity Values Map; or,

3) Whether the development will have a significant impact on threatened species or ecological communities.

Only one threshold must be crossed to trigger a BAM. Note that 'native vegetation' includes not just the trees, but all vegetation forms.

1.1 Biodiversity Values Map

The proposed development site is not on the Biodiversity Values Map.

1.2 Area Threshold

The development site is zoned Rural (RU1) in Liverpool Plains LEP 2011 and has a minimum lot size of 200 ha. The threshold for clearing in this lot size is 1 ha (10,000m2).

Part of the subject land is defined as 'Category 1 – exempt' land under Part 5 of the LLS Act (2013) as it has been previously cleared of native vegetation and planted with exotic pastures. Other parts of the subject land are not Category 1-exempt, as they have remnant paddock trees with uncleared native vegetation beneath them. This assessment only considers the areas that are not category 1-exempt land. Under Section 60H of the Local Land Services Act 2013, Category 1 land is defined as:

> *(1) Land is to be designated as category 1-exempt land if the Environment Agency Head reasonably believes that--*
>
> *(a) the land was cleared of native vegetation as at 1 January 1990, or*
>
> *(b) the land was lawfully cleared of native vegetation between 1 January 1990 and the commencement of this Part.*
>
> *(2) Land is to be designated as category 1-exempt land if the Environment Agency Head reasonably believes that--*
>
> *(a) the land contains low conservation value grasslands, or*
>
> *(b) the land contains native vegetation that was identified as regrowth in a property vegetation plan referred to in section 9 (2) (b) of the Native Vegetation Act 2003 , or*
>
> *(c) the land is of a kind prescribed by the regulations as category 1-exempt land.*

We carried out BAM plots in the grassland throughout the site which showed a very low diversity and cover of native species. There were clear signs that the site had been cultivated and that exotic pasture (mostly African Love Grass) had been sown. The plots resulted in an average Vegetation Integrity Score (VIS) of <15, which is below the threshold for consideration in a BDAR, so we designated these sites as 'low conservation-value grasslands'. We also examined the ground-layer vegetation under paddock trees and found that this was more diverse and had not been cultivated, so did not meet the definition of Category 1 exempt lands.

Apart from the vegetation on the road reserve where the crossover will enter the property, all of the land subject to this development is Category 1 exempt land, except:

- The area directly within the canopy drip-line of all paddock trees,
- The patch of trees shown in Figure 2 in the middle of the development footprint.

Figure 2: Development footprint showing native vegetation to be cleared.

The project has gone through several iterations, mainly in response to biodiversity impacts we identified which would have resulted in the need to produce a Biodiversity Development Assessment Report (BDAR) and purchase and retire offset credits. The final iteration has been designed to reduce the total footprint of vegetation clearing associated with the project, to below the 1ha threshold for triggering the Biodiversity Offsets Scheme. Figure 2 shows the final layout, indicating two areas of vegetation community and a number of scattered trees to be cleared to make way for the project. The remainder of the land is Category 1-exempt and does not need to be considered under the BAM. Table 1 shows that the total area of native vegetation to be cleared is 5517m^2. Based on this final layout, the project does not exceed the 'area' threshold (10,000m^2) requiring entry into the Biodiversity Offset Scheme.

Table 1: Vegetation to be cleared and areas of each item.

Item	Vegetation affected	Area cleared
Crossover	Verge Council Road Reserve	1600m^2
Gin Building	Tree #23	79m^2

Module Track	Tree #21	79m^2
South Module Storage pad	Narrow Leaf Ironbark Vegetation Patch	3300m2
	Trees #102,103,104,106,107	460m^2
TOTAL		5517m^2

The final trigger for the Biodiversity Offset Scheme is whether or not the project will have a significant impact on a threatened species or ecological community. We have considered this in some detail.

1.3 Significant impact on threatened entities

1.3.1 Desktop Survey

We carried out a desktop search for threatened species and communities ('entities') which have been recorded in the vicinity of the subject land (Appendix A). The search was conducted through a Bionet Licensed Report of all Valid Records of Entities in selected area [North: -31.34 West: 150.00 East: 150.20 South: -31.54]. The search showed five endangered species (all extinct in NSW except Brush-tailed Rock Wallaby) and nine Vulnerable fauna species have been recorded in the region:

- Koala,
- Speckled Warbler,
- Varied Sittella,
- Little Lorikeet,
- Little Eagle,
- Squirrel Glider,
- Grey-crowned Babbler,
- Long-haired Rat,
- Glossy Black Cockatoo.

We reviewed the habitat requirements of all of these species and compared them to available habitat across all possible areas to be affected by the development.

There is no suitable habitat for the Brush-tailed Rock Wallaby on the site and the population in the nearby sandstone hills is no longer present.

The Long-haired Rat could be excluded from further survey as it no longer occurs within 500km of the site, the record being a very old one.

For the remaining eight species, we conducted targeted fauna surveys to determine if they were present.

1.3.2 Vegetation Surveys

As part of early iterations of the plan for this development, we conducted plot surveys using the Biodiversity Assessment Methodology (2020). Eight plots were surveyed (Fig 3), covering the three different vegetation communities we identified:

i. PCT 202: Fuzzy Box woodland on colluvium and alluvial flats in the Brigalow Belt South Bioregion (including Pilliga) and Nandewar Bioregion,

ii. PCT 148: Dirty Gum - Buloke - White Cypress Pine - ironbark shrubby woodland on deep sandy soils in the Liverpool Plains region of the Brigalow Belt South Bioregion

iii. Exotic grassland derived from PCTs 148 or 202.

Plot data sheets from these eight survey plots are included as Appendix B. We noted from our vegetation surveys on and around the site, that the vegetation included patches of the Endangered Ecological Community: *Fuzzy Box Woodland on alluvial soils of the South Western Slopes, Darling Riverine Plains and Brigalow Belt South bioregions* (Fig 3).

Figure 3: Location of 8 BAM plots and approximate area of Fuzzy Box Woodland EEC (white shading) and disturbance (red shading). [Source: Google Earth]

1.4 Survey effort and results

Koala

Koalas are known to occur in the area and there are recent records within the area of the Bionet Search. To determine if koalas are present on the site, or have recently visited the site we:

- Carried out scat searches according to the SAT method around all trees in the development footprint and in patches in the road reserve and bushland adjoining the property to the east,
- Used spotlights to observe any animals in the canopy of trees throughout the development footprint and adjoining land.

No koalas were observed and we found no scats. We also looked for signs of koala use such as scratchings on trees (Triggs, 1998) but found nothing that could be definitely attributed to koalas.

While there is no evidence that koalas have been using the site recently, they may still occasionally use the trees on site. Before removing any trees marked in Figure 2, check the tree for koalas by having a good look into the canopy. If a koala is present, wait until it has gone before knocking over the tree.

A five-part test of significance is not required because there will be no impact from the development on koalas.

Speckled Warbler

These birds prefer dense woodland or forest with low shrubs and piles of branches and stick (NSW Government, 2021). No such habitat exists within the development footprint, except in the crossover across the road reserve. We observed (using binoculars) areas of suitable habitat within the road reserve early in the morning (two occasions) and once in the early evening. We saw and heard no Speckled Warblers in this area during these observations. We did however, see and hear at least one Speckled Warbler in dense bushland to the east of the development footprint, at least 700m from the site. It is likely that they are also using the dense tea-tree shrub regrowth in the north east corner of the paddock the development is in, but there will be no impact on the birds from the development.

A five-part test of significance is not required because there will be no impact from the development on Speckled Warblers.

Varied Sittella

Like the Speckled Warbler, the Varied Sittella likes complex habitat with a shrub layer and trees. While observing for Speckled Warblers, we also watched for this species, which can sometimes be observed on the trunks of trees. While the habitat in the road reserve was suitable for this species, we did not see or hear any individuals on the 3 occasions we surveyed.

A five-part test of significance is not required because there will be no impact from the development on Varied Sittellas.

Little Lorikeet

Little Lorikeets feed on eucalypt blossom and can be observed in small flocks in the canopy of eucalypts and flying between them. While carrying out vegetation surveys at the site, we closely observed any flocks of parrots that looked like Little Lorikeets. During one visit to the site, some of the *Eucalyptus conica* (Fuzzy Box) trees were flowering and there were different birds visiting the flowers, however, we saw no Little Lorikeets.

This bird is likely to visit the site and the surrounding vegetation when the eucalypts are flowering, however the loss of flowering trees as a result of this development compared to the extent of flowering trees in the immediate vicinity of the site is negligible and will have no impact on the species.

A five-part test of significance is not required because there will be no impact from the development on Little Lorikeets.

Little Eagle

Little Eagles are large raptors which use tall trees, both live and dead, for perching and nesting. Such trees are present within and adjoining the development footprint. We used binoculars to watch suitable roost and nest sites on two occasions at dawn and dusk and also looked for signs of these birds during the day.

We monitored a large stick nest that we observed in land adjoining the development site and found that it was being used by a pair of Wedge-tailed Eagles (*Aquila audax*), although we saw no signs of fledglings.

We saw no signs of stick nests in any trees proposed for removal. We also searched under these trees looking for signs of raptor feeding (pellets, bones, tails) but found no signs (Triggs, 1998). We concluded that Little Eagles are not present at the site nor in the immediate vicinity.

A five-part test of significance is not required because there will be no impact from the development on Little Eagles.

Squirrel Glider

Squirrel Gliders are arboreal marsupials that nest and shelter in tree hollows and feed in the canopy at night on a variety of plant and animal foods. They move between trees by gliding, usually landing on the trunk of the landing tree. Gliders can be found in open forest and woodland, but are not commonly found in isolated paddock trees.

The only area of suitable habitat within the development footprint is in the crossover through the road reserve. We spent four hours over two nights spotlighting in this habitat, particularly looking for large eucalypts with hollows. We saw several brush-tailed and ring-tailed possums, but no Squirrel (or Sugar) Gliders. The spotlighting covered not just the proposed crossover, but all of the roadside area adjacent to the development footprint.

While spotlighting for koalas in the isolated paddock trees, we were also looking for other animals including Squirrel Gliders. We saw no Squirrel Gliders in this area either. We concluded that the site does not support Squirrel Gliders.

A five-part test of significance is not required because there will be no impact from the development on Squirrel Gliders.

Grey-crowned Babbler

This species commonly occurs in family groups in woodland and forest and can be observed on the ground and in the mid and upper canopy. They are often noisy, calling between individuals or from a ‘sentry’ bird. They are active during the day.

We observed all suitable habitat areas during the day while doing vegetation surveys. We used binoculars to scan suitable habitat areas and to look at noisy birds. We neither saw, nor heard, any Grey-crowned Babblers on the site although similar, noisy birds in family groups were observed (White-winged Choughs and Apostle Birds). We concluded that these birds are not present on the development site.

A five-part test of significance is not required because there will be no impact from the development on Grey-crowned Babblers.

Glossy Black Cockatoo

This species occurs in small family groups in woodland or forest where there are species of *Casuarina/Allocasuarina*, which is their preferred food source. This habitat occurs within the footprint

of the development site only within the crossover through the road reserve. This habitat includes many large Buloke (*Allocasuarina luehmannii*). While Glossy Black Cockatoos can be observed feeding in these trees, their presence can also be detected by signs of their feeding including chewed cones on the ground under Bulokes.

We looked for this species throughout the road reserve on two occasions and also listened for their distinctive soft calls. These surveys were conducted during the day. We saw and heard no Glossy Black Cockatoos, nor did we see any signs of their feeding. While it is possible that they will use the available habitat at and near the site, the loss of suitable habitat compared to the extent in the road reserve and the forest adjoining the eastern side of the property is negligible.

A five-part test of significance is not required because there will be no impact from the development on Glossy Black Cockatoos.

Fuzzy Box Woodland on alluvial soils of the South Western Slopes, Darling Riverine Plains and Brigalow Belt South bioregions.

Some of the trees to be removed are isolated paddock trees of *Eucalyptus conica* or Fuzzy Box. While the presence of these trees and the location of the site within the Brigalow Belt South bioregion fits the definition of the Endangered Ecological Community, the lack of characteristic understorey species and the sparse density of the trees, precludes the paddock trees from meeting the definition of the EEC. The EEC definitely exists on the road reserve, south of the area proposed for the crossover. In this area, the woodland is a woodland dominated by Fuzzy Box, with a sparse shrub layer and a grassy groundlayer with many of the characteristic species.

We have also determined that the area through which the crossover will pass supports this EEC as it has Fuzzy Box trees and other canopy species associated with the EEC and characteristic species in the groundlayer. The project will result in the loss of 1600m^2 of this vegetation community.

A five-part test of significance is required because there will be some impact from the development on Fuzzy Box Woodland EEC (see below).

1.4.1 Five-part Tests of Significance

As described in the previous section, a five-part test of significance is only required for the impact of the development on the Endangered Ecological Community *Fuzzy Box Woodland on alluvial soils of the South Western Slopes, Darling Riverine Plains and Brigalow Belt South bioregions.*

The aim of the 5-part test is to determine if the impact on the EEC will be significant. If it is deemed to be a significant impact, then a BDAR is required.

Fuzzy Box Woodland

1: in the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,

Not applicable

2: in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:

i: is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

The area of this ecological community to be lost as a result of this development is 1600m^2 or 0.16ha. From our observations of the vegetation community on the road reserve alone, we estimate that there is 16ha of this EEC immediately adjacent to the development site. Only 1% of the local extent of this EEC will be lost, which is highly unlikely to cause the local extinction of the EEC.

ii: is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,

The area to be cleared is in the part of this EEC with the lowest species diversity compared to the definition of the EEC. It is also denser, with dense growth of Buloke (*Allocasuarina luehmannii*) and White Cypress Pine (*Callitris glaucophylla*) compared to other local sites with a more open woodland structure. The removal of the 0.16ha will have no impact on species diversity or structure of the EEC and will not lead to extinction as a result of the clearing.

3: in relation to the habitat of a threatened species or ecological community:

i. the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and

The response to Part 2 above, shows that the habitat of this EEC will be reduced by 1%.

ii: whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and

The clearing of the crossover will create a break in the continuous vegetation on the roadside of 12m including table drains. Over times, tree canopies will converge across part of this gap. This distance is negligible for the bird and animal species using the vegetation as a movement corridor. It is well within the range of gliders to cross and will not expose any woodland birds to additional risks of predation.

iii: the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality,

The small area to be removed will not have a significant impact on the long-term survival of this EEC as the roadside will continue to support many of the plant and animal species associated with the community to enable continued reproduction and regeneration.

4: whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly),

There is no area of outstanding biodiversity value that will be affected by this development.

5: whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.

Clearing is a key threatening process for this EEC, but as discussed above, the extent is very small compared to the local extent of the community. As a result, this will be a one-off event, resulting in the loss of a small area of the EEC.

Based on this 5-part test, the proposed development will <u>not</u> have a significant impact on the Endangered Ecological Community and a BDAR is not required.

1.5 Koala Habitat

The State Environment Planning Policy (Biodiversity and Conservation) 2021, including the Koala Habitat Protection SEPP 2020 requires that koala habitat be assessed as part of the development.

Liverpool Plains Shire is listed in Schedule 1 of the SEPP as a local government area where the SEPP applies.

The SEPP requires that a determination of whether the site is 'potential koala habitat' to be made. If so, a determination of whether the site is 'core koala habitat' must be made. If the site is determined to be 'core koala habitat', a Koala Plan of Management (KPOM) must be prepared.

1.5.1 Potential Koala Habitat

Potential koala habitat means:

> *areas of native vegetation where trees of the types listed in Schedule 2 constitute at least 15% of the total number of trees in the upper or lower strata of the tree component.*

None of the species listed in Schedule 2 of the SEPP were found on or near the development site, therefore the site is not 'potential koala habitat' and further assessment is not required.

A Koala Plan of Management is <u>not</u> required.

Both the authors of this report are suitably qualified to carry out this assessment as we both have tertiary degrees in environmental sciences and have experience in the identification of koala food trees and in koala survey methods.

1.6 Environment Protection and Biodiversity Conservation Act

We carried out a Protected Matters Search in an area within a 5 km radius of the site. Table 2 shows the results for threatened species and includes an explanation of likely presence and if survey is required. We then looked for these species or signs of them and considered whether the development would have a significant impact on them, if present.

Table 2: Protected Matters Search results.

Species ID	Scientific Name	Common Name	Class	Simple Presence	Presence Text	Threatened Category	Migratory Status	Migratory Category	Marine Status	Likely occurrence at site
82338	*Anthochaera phrygia*	Regent Honeyeater	Bird	Likely	Foraging, feeding or related behaviour likely to occur within area	Critically Endangered				Possible – require flowering eucalypts. Survey
4325	*Euphrasia arguta*	null	Plant	May	Species or species habitat may occur within area	Critically Endangered				Unsuitable habitat
744	*Lathamus discolor*	Swift Parrot	Bird	Likely	Species or species habitat likely to occur within area	Critically Endangered			Listed - overfly marine area	Possible – require flowering eucalypts. Survey

856	*Calidris ferruginea*	Curlew Sandpiper	Bird	May	Species or species habitat may occur within area	Critically Endangered	Migratory	Migratory Wetlands Species	Listed - overfly marine area	Unsuitable habitat.
1001	*Botaurus poiciloptilus*	Australasian Bittern	Bird	May	Species or species habitat may occur within area	Endangered				Unsuitable habitat.
75184	*Dasyurus maculatus maculatus (SE mainland population)*	Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population)	Mammal	Likely	Species or species habitat likely to occur within area	Endangered				Unsuitable habitat.
85104	*Phascolarctos cinereus (combined populations of Qld, NSW and the ACT)*	Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory)	Mammal	Known	Species or species habitat known to occur within area	Endangered				Possible - survey
9190	*Lepidium monoplocoides*	Winged Pepper-cress	Plant	May	Species or species habitat may occur within area	Endangered				Unsuitable habitat.

77037	*Rostratula australis*	Australian Painted Snipe	Bird	Likely	Species or species habitat likely to occur within area	Endangered			Listed - overfly marine area	Unsuitable habitat.
92384	*Vincetoxicum forsteri*	null	Plant	Likely	Species or species habitat likely to occur within area	Endangered (listed as Tylophora linearis)				Possible - survey
1665	*Aprasia parapulchella*	Pink-tailed Worm-lizard, Pink-tailed Legless Lizard	Reptile	Likely	Species or species habitat likely to occur within area	Vulnerable				Unsuitable habitat.
738	*Polytelis swainsonii*	Superb Parrot	Bird	May	Species or species habitat may occur within area	Vulnerable				Possible - survey
934	*Leipoa ocellata*	Malleefowl	Bird	May	Species or species habitat may occur within area	Vulnerable				Unsuitable habitat.

682	*Hirundapus caudacutus*	White-throated Needletail	Bird	Known	Species or species habitat known to occur within area	Vulnerable	Migratory	Migratory Terrestrial Species	Listed - overfly marine area	Unsuitable habitat.
186	*Pteropus poliocephalus*	Grey-headed Flying-fox	Mammal	May	Foraging, feeding or related behaviour may occur within area	Vulnerable				Unsuitable habitat.
183	*Chalinolobus dwyeri*	Large-eared Pied Bat, Large Pied Bat	Mammal	Likely	Species or species habitat likely to occur within area	Vulnerable				Unsuitable habitat.
87153	*Androcalva procumbens*	null	Plant	Likely	Species or species habitat likely to occur within area	Vulnerable				Unsuitable habitat.
67036	*Calyptorhynchus lathami lathami*	South-eastern Glossy Black-Cockatoo	Bird	Likely	Species or species habitat likely to occur within area	Vulnerable				Possible - survey
15202	*Thesium australe*	Austral Toadflax, Toadflax	Plant	May	Species or species habitat may occur within area	Vulnerable				Possible - survey

1649	*Delma impar*	Striped Legless Lizard, Striped Snake-lizard	Reptile	May	Species or species habitat may occur within area	Vulnerable				Possible - survey
83395	*Nyctophilus corbeni*	Corben's Long-eared Bat, South-eastern Long-eared Bat	Mammal	Likely	Species or species habitat likely to occur within area	Vulnerable				Unsuitable habitat
10976	*Lepidium aschersonii*	Spiny Pepper-cress	Plant	May	Species or species habitat may occur within area	Vulnerable				Unsuitable habitat.
470	*Grantiella picta*	Painted Honeyeater	Bird	Likely	Species or species habitat likely to occur within area	Vulnerable				Unsuitable habitat – no mistletoe.
929	*Falco hypoleucos*	Grey Falcon	Bird	Likely	Species or species habitat likely to occur within area	Vulnerable				Possible - survey
14159	*Dichanthium setosum*	bluegrass	Plant	Likely	Species or species habitat likely to occur within area	Vulnerable				Possible - survey

1.6.1 Threatened species survey

As outlined in section 1.3 the habitat at the site, which will be impacted by the development, includes scattered trees of *Eucalyptus conica* in the open paddock, degraded exotic pasture and 0.16ha of the NSW EEC, Fuzzy Box Grassy Woodland (not a Commonwealth-listed EEC). In total 0.55ha of this habitat will be cleared. While undertaking surveys for the BCA Act-listed species outlined in Section 1.3.1, we also looked for the species listed in Table 3 identified for survey.

Species using flowering eucalypts

We saw no signs of Regent Honeyeaters, Swift Parrots or Superb Parrots using the eucalypts on the site. Even if they had been present, the loss of habitat for these species is negligible in the context of the extent of flowering eucalypts in the very large patch to the east and north east of the site (Fig 1). Therefore, we do not consider the development will have a significant impact on these species, such that a referral to the Minister for the Environment is warranted.

Threatened Grassland Plant Species

Plant species possibly occurring on the site are: *Thesium australe* and *Dichanthium setosum.* The listed species usually occur in high quality grassland or grassy woodland. The only site where these species may occur on site was in the open grassland, but these are highly degraded and sown with very-competitive exotic grasses. We found none of these plants in the 3 BAM plots we surveyed in the open grassland. Therefore, we do not consider the development will have a significant impact on these species, such that a referral to the Minister for the Environment is warranted.

Tylophora linearis

This species requires Cypress Pine-dominated Dry Sclerophyll Forest, which is found in the area where the crossover crosses the road reserve. We searched for this species in the BAM plot surveyed in this area without finding it. We also searched in other areas of the road reserve, specifically looking at vines in *Callitris glaucophylla*. We did not find any individuals of this species.

Falco hypoleucus

The Grey Falcon is known from this area, although Bionet has no records within a 10km radius of the site. We searched for this species while looking for Little Eagles but saw no birds or signs of them. We searched at a time when this species would be nesting (late winter) but saw no nesting birds. This species is believed to be extinct in areas with >500mm rainfall, such as this site.

Delma impar

Although this species is sometimes found in grasslands with a high exotic cover, the distribution is south of the site of the development. It is not usually found in areas that have been cultivated and requires rocks for shelter. The habitat and distribution of this species means it is highly unlikely to be found at this site.

Calyptorhynchus lathami lathami

Glossy Black Cockatoos have been discussed in Section 1.4.

1.6.2 Referral to Minister for the Environment

We did not find any species or communities listed in the Protected Matters Search, or if they are possibly present, the impact on the species will not be significant. We therefore do not recommend making a referral to the Commonwealth Minister for the Environment for any of the listed Matters.

1.7 References

NSW Government. (2021, May). *Threatened Species Profiles*. Retrieved from Office of Environment and Heritage: https://www.environment.nsw.gov.au/threatenedspeciesapp/

Triggs, B. (1998). *Tracks, scats and other traces: A field guide to Australian mammals.* Oxford University Press.

Appendix A Bionet search results

Table 3 shows the results of a Bionet Search within a search area bounded by North: -31.34 West: 150.00 East: 150.20 South: -31.54. The green highlights show species observed on site.

Table 3: Results of Bionet Search (Green shading highlights threatened species)

Kingdom	Class	Family	Species Code	Scientific Name	Exotic	Common Name	NSW status	Comm. status	Records
Animalia	Mammalia	Macropodidae	1215	*Petrogale penicillata*		Brush-tailed Rock-wallaby	E1,P	V	2
Animalia	Mammalia	Macropodidae	1201	*Onychogalea fraenata*		Bridled Nailtail Wallaby	E4,P	E	1
Animalia	Mammalia	Muridae	1426	*Conilurus albipes*		White-footed Tree-rat	E4,P	X	2
Animalia	Mammalia	Macropodidae	1194	*Lagorchestes leporides*		Eastern Hare-wallaby	E4,P	X	1
Animalia	Mammalia	Muridae	1461	*Pseudomys gouldii*		Gould's Mouse	E4,P	X	1
Animalia	Aves	Meliphagidae	0640	*Acanthagenys rufogularis*		Spiny-cheeked Honeyeater	P		4
Animalia	Aves	Acanthizidae	0476	*Acanthiza apicalis*		Inland Thornbill	P		1
Animalia	Aves	Acanthizidae	0486	*Acanthiza chrysorrhoa*		Yellow-rumped Thornbill	P		5
Animalia	Aves	Acanthizidae	0471	*Acanthiza nana*		Yellow Thornbill	P		7
Animalia	Aves	Acanthizidae	0475	*Acanthiza pusilla*		Brown Thornbill	P		1

Animalia	Aves	Acanthizidae	0484	*Acanthiza reguloides*		Buff-rumped Thornbill	P		6
Animalia	Aves	Acrocephalidae	0524	*Acrocephalus australis*		Australian Reed-Warbler	P		1
Animalia	Aves	Aegothelidae	0317	*Aegotheles cristatus*		Australian Owlet-nightjar	P		2
Animalia	Aves	Psittacidae	0281	*Alisterus scapularis*		Australian King-Parrot	P		5
Animalia	Aves	Anatidae	0212	*Anas rhynchotis*		Australasian Shoveler	P		1
Animalia	Aves	Anatidae	0208	*Anas superciliosa*		Pacific Black Duck	P		1
Animalia	Reptilia	Scincidae	2041	*Anomalopus leuckartii*		Two-clawed Worm-skink	P		2
Animalia	Aves	Meliphagidae	0638	*Anthochaera carunculata*		Red Wattlebird	P		3
Animalia	Aves	Psittacidae	0280	*Aprosmictus erythropterus*		Red-winged Parrot	P		1
Animalia	Aves	Accipitridae	0224	*Aquila audax*		Wedge-tailed Eagle	P		2
Animalia	Aves	Ardeidae	0189	*Ardea pacifica*		White-necked Heron	P		1
Animalia	Mammalia	Molossidae	1324	*Austronomus australis*		White-striped Freetail-bat	P		2
Animalia	Aves	Anatidae	0215	*Aythya australis*		Hardhead	P		1
Animalia	Aves	Psittacidae	0291	*Barnardius zonarius barnardi*		[Mallee Ringneck]	P		1
Animalia	Aves	Cacatuidae	0269	*Cacatua galerita*		Sulphur-crested Cockatoo	P		12
Animalia	Aves	Meliphagidae	0614	*Caligavis chrysops*		Yellow-faced Honeyeater	P		4

Animalia	Aves	Cuculidae	0342	*Chalcites basalis*		Horsfield's Bronze-Cuckoo	P		1
Animalia	Aves	Anatidae	0202	*Chenonetta jubata*		Australian Wood Duck	P		1
Animalia	Aves	Pachycephalidae	0408	*Colluricincla harmonica*		Grey Shrike-thrush	P		3
Animalia	Aves	Campephagidae	0424	*Coracina novaehollandiae*		Black-faced Cuckoo-shrike	P		7
Animalia	Aves	Corcoracidae	0693	*Corcorax melanorhamphos*		White-winged Chough	P		2
Animalia	Aves	Climacteridae	0558	*Cormobates leucophaea*		White-throated Treecreeper	P		8
Animalia	Aves	Corvidae	0930	*Corvus coronoides*		Australian Raven	P		5
Animalia	Aves	Phasianidae	0009	*Coturnix pectoralis*		Stubble Quail	P		1
Animalia	Aves	Artamidae	0700	*Cracticus nigrogularis*		Pied Butcherbird	P		1
Animalia	Aves	Artamidae	0702	*Cracticus torquatus*		Grey Butcherbird	P		7
Animalia	Reptilia	Scincidae	2331	*Cryptoblepharus virgatus*		Cream-striped Shinning-skink	P		1
Animalia	Aves	Alcedinidae	0322	*Dacelo novaeguineae*		Laughing Kookaburra	P		4
Animalia	Reptilia	Elapidae	2655	*Demansia psammophis*		Yellow-faced Whip Snake	P		1
Animalia	Aves	Dicaeidae	0564	*Dicaeum hirundinaceum*		Mistletoebird	P		3
Animalia	Aves	Casuariidae	0001	*Dromaius novaehollandiae*		Emu	P		1

Animalia	Aves	Campephagidae	0429	*Edolisoma tenuirostris*		Cicadabird	P		1
Animalia	Aves	Accipitridae	0232	*Elanus axillaris*		Black-shouldered Kite	P		1
Animalia	Aves	Meliphagidae	0641	*Entomyzon cyanotis*		Blue-faced Honeyeater	P		1
Animalia	Aves	Cacatuidae	0273	*Eolophus roseicapilla*		Galah	P		10
Animalia	Aves	Petroicidae	0392	*Eopsaltria australis*		Eastern Yellow Robin	P		8
Animalia	Aves	Caprimulgidae	0330	*Eurostopodus mystacalis*		White-throated Nightjar	P		1
Animalia	Aves	Rallidae	0059	*Fulica atra*		Eurasian Coot	P		1
Animalia	Aves	Rallidae	0056	*Gallinula tenebrosa*		Dusky Moorhen	P		1
Animalia	Aves	Columbidae	0032	*Geopelia humeralis*		Bar-shouldered Dove	P		2
Animalia	Aves	Acanthizidae	0463	*Gerygone fusca*		Western Gerygone	P		5
Animalia	Aves	Psittacidae	0258	*Glossopsitta concinna*		Musk Lorikeet	P		1
Animalia	Aves	Monarchidae	0415	*Grallina cyanoleuca*		Magpie-lark	P		4
Animalia	Aves	Artamidae	0705	*Gymnorhina tibicen*		Australian Magpie	P		8
Animalia	Aves	Hirundinidae	0357	*Hirundo neoxena*		Welcome Swallow	P		1
Animalia	Mammalia	Muridae	1415	*Hydromys chrysogaster*		Water-rat	P		1

Animalia	Reptilia	Scincidae	2475	*Lerista bougainvillii*		South-eastern Slider	P		1
Animalia	Amphibia	Hylidae	3191	*Litoria latopalmata*		Broad-palmed Frog	P		1
Animalia	Amphibia	Hylidae	3204	*Litoria peronii*		Peron's Tree Frog	P		1
Animalia	Aves	Maluridae	0529	*Malurus cyaneus*		Superb Fairy-wren	P		6
Animalia	Aves	Meliphagidae	0635	*Manorina flavigula*		Yellow-throated Miner	P		1
Animalia	Aves	Meliphagidae	0634	*Manorina melanocephala*		Noisy Miner	P		7
Animalia	Aves	Meliphagidae	0583	*Melithreptus brevirostris*		Brown-headed Honeyeater	P		1
Animalia	Reptilia	Scincidae	2519	*Menetia greyii*		Common Dwarf Skink	P		1
Animalia	Aves	Meropidae	0329	*Merops ornatus*		Rainbow Bee-eater	P		1
Animalia	Aves	Phalacrocoracidae	0100	*Microcarbo melanoleucos*		Little Pied Cormorant	P		1
Animalia	Aves	Petroicidae	0377	*Microeca fascinans*		Jacky Winter	P		1
Animalia	Aves	Alaudidae	0648	*Mirafra javanica*		Horsfield's Bushlark	P		1
Animalia	Aves	Meliphagidae	0586	*Myzomela sanguinolenta*		Scarlet Honeyeater	P		1
Animalia	Aves	Meliphagidae	0617	*Nesoptilotis leucotis*		White-eared Honeyeater	P		4
Animalia	Aves	Strigidae	9922	*Ninox novaeseelandiae*		Southern Boobook	P		4
Animalia	Mammalia	Macropodidae	1261	*Notamacropus rufogriseus*		Red-necked Wallaby	P		2

Animalia	Aves	Cacatuidae	0274	*Nymphicus hollandicus*		Cockatiel	P		2
Animalia	Aves	Columbidae	0043	*Ocyphaps lophotes*		Crested Pigeon	P		7
Animalia	Aves	Pachycephalidae	0398	*Pachycephala pectoralis*		Golden Whistler	P		1
Animalia	Aves	Pachycephalidae	0401	*Pachycephala rufiventris*		Rufous Whistler	P		9
Animalia	Aves	Pardalotidae	0565	*Pardalotus punctatus*		Spotted Pardalote	P		3
Animalia	Aves	Pardalotidae	0976	*Pardalotus striatus*		Striated Pardalote	P		3
Animalia	Aves	Hirundinidae	0360	*Petrochelidon ariel*		Fairy Martin	P		1
Animalia	Aves	Petroicidae	0381	*Petroica goodenovii*		Red-capped Robin	P		1
Animalia	Aves	Columbidae	0034	*Phaps chalcoptera*		Common Bronzewing	P		4
Animalia	Aves	Meliphagidae	0645	*Philemon corniculatus*		Noisy Friarbird	P		5
Animalia	Aves	Threskiornithidae	0182	*Platalea flavipes*		Yellow-billed Spoonbill	P		1
Animalia	Aves	Psittacidae	0282	*Platycercus elegans*		Crimson Rosella	P		2
Animalia	Aves	Psittacidae	0288	*Platycercus eximius*		Eastern Rosella	P		8
Animalia	Aves	Meliphagidae	0585	*Plectorhyncha lanceolata*		Striped Honeyeater	P		4

Animalia	Aves	Podargidae	0313	*Podargus strigoides*		Tawny Frogmouth	P		1
Animalia	Reptilia	Agamidae	2177	*Pogona barbata*		Bearded Dragon	P		1
Animalia	Aves	Psittacidae	0295	*Psephotus haematonotus*		Red-rumped Parrot	P		5
Animalia	Reptilia	Elapidae	2699	*Pseudonaja textilis*		Eastern Brown Snake	P		1
Animalia	Aves	Psophodidae	0421	*Psophodes olivaceus*		Eastern Whipbird	P		1
Animalia	Aves	Meliphagidae	0625	*Ptilotula penicillata*		White-plumed Honeyeater	P		3
Animalia	Aves	Rhipiduridae	0361	*Rhipidura albiscapa*		Grey Fantail	P		4
Animalia	Aves	Rhipiduridae	0364	*Rhipidura leucophrys*		Willie Wagtail	P		5
Animalia	Aves	Acanthizidae	0465	*Smicrornis brevirostris*		Weebill	P		5
Animalia	Mammalia	Dasyuridae	1072	*Sminthopsis crassicaudata*		Fat-tailed Dunnart	P		1
Animalia	Aves	Artamidae	0694	*Strepera graculina*		Pied Currawong	P		6
Animalia	Aves	Corcoracidae	0675	*Struthidea cinerea*		Apostlebird	P		2
Animalia	Aves	Podicipedidae	0061	*Tachybaptus novaehollandiae*		Australasian Grebe	P		1
Animalia	Mammalia	Tachyglossidae	1003	*Tachyglossus aculeatus*		Short-beaked Echidna	P		9
Animalia	Aves	Threskiornithidae	0179	*Threskiornis moluccus*		Australian White Ibis	P		2

Animalia	Aves	Threskiornithidae	0180	*Threskiornis spinicollis*		Straw-necked Ibis	P		1
Animalia	Aves	Alcedinidae	0326	*Todiramphus sanctus*		Sacred Kingfisher	P		2
Animalia	Aves	Psittacidae	9947	*Trichoglossus haematodus*		Rainbow Lorikeet	P		1
Animalia	Mammalia	Phalangeridae	T082	*Trichosurus sp.*		brushtail possum	P		1
Animalia	Mammalia	Phalangeridae	1113	*Trichosurus vulpecula*		Common Brushtail Possum	P		1
Animalia	Aves	Tytonidae	9923	*Tyto javanica*		Eastern Barn Owl	P		4
Animalia	Aves	Charadriidae	0133	*Vanellus miles*		Masked Lapwing	P		2
Animalia	Mammalia	Macropodidae	1242	*Wallabia bicolor*		Swamp Wallaby	P		2
Animalia	Aves	Zosteropidae	0574	*Zosterops lateralis*		Silvereye	P		1
Animalia	Mammalia	Phascolarctidae	1162	*Phascolarctos cinereus*		Koala	V,P	V	18
Animalia	Aves	Acanthizidae	0504	*Chthonicola sagittata*		Speckled Warbler	V,P		2
Animalia	Aves	Neosittidae	0549	*Daphoenositta chrysoptera*		Varied Sittella	V,P		2
Animalia	Aves	Psittacidae	0260	*Glossopsitta pusilla*		Little Lorikeet	V,P		1
Animalia	Aves	Accipitridae	0225	*Hieraaetus morphnoides*		Little Eagle	V,P		1
Animalia	Mammalia	Petauridae	1137	*Petaurus norfolcensis*		Squirrel Glider	V,P		1

Animalia	Aves	Pomatostomidae	8388	*Pomatostomus temporalis temporalis*		Grey-crowned Babbler (eastern subspecies)	V,P		5
Animalia	Mammalia	Muridae	1400	*Rattus villosissimus*		Long-haired Rat	V,P		1
Animalia	Aves	Cacatuidae	0265	*^^Calyptorhynchus lathami*		Glossy Black-Cockatoo	V,P,2		1
Animalia	Mammalia	Cervidae	9112	*Cervus sp.*	*	Unidentified Deer			5
Animalia	Mammalia	Muridae	1412	*Mus musculus*	*	House Mouse			1
Animalia	Aves	Sturnidae	0999	*Sturnus vulgaris*	*	Common Starling			1
Animalia	Mammalia	Canidae	1532	*Vulpes vulpes*	*	Fox			7

Appendix B BAM plot assessment sheets

Plot 1

-This document has not been endorsed or approved by Office of Environment and Heritage or Muddy Boots Environmental Training-

BAM Site – Field Survey Form Site Sheet no:

		Survey Name	Zone ID	Recorders			
Date	1 / 9 / 21	CB AGRI HUB		DBL, CC			
Zone 55 J	Datum GDA 94	Plot ID	210901-01	Plot dimensions	50x20	Photo #	
Easting 224428	Northing 6517158	IBRA region	BBS	Midline bearing from 0 m	0°		
Vegetation Class						Confidence: H M L	
Plant Community Type	102 (Good)			EEC:		Confidence: H M L	

1187
352m

Record easting and northing at 0 m on midline. Dimensions (Shape) of 0.04 ha base plot.

BAM Attribute (400 m² plot)		Sum values
Count of Native Richness	Trees	4
	Shrubs	4
	Grasses etc.	14
	Forbs	8
	Ferns	1
	Other	2
Sum of Cover of native vascular plants by growth form group	Trees	25
	Shrubs	2.6
	Grasses etc.	27.3
	Forbs	5
	Ferns	0.3
	Other	0.1
High Threat Weed cover		0

BAM Attribute (1000 m² plot)		
DBH	# Tree Stems Count	# Stems with Hollows
80 + cm		
50 – 79 cm		
30 – 49 cm	(8)	
20 – 29 cm	(16)	
10 – 19 cm	(30)	
5 – 9 cm	(8)	
< 5 cm	92 seedlings	n/a
Length of logs (m) (≥10 cm diameter, >50 cm in length)	42m	

Counts apply when the **number of tree stems** within a size class is ≤ 10. Estimates can be used when > 10 (eg. 10, 20, 30..., 100, 200, 300...). For a **multi-stemmed tree**, only the largest living stem is included in the count/estimate. **Tree stems must be living.**

For **hollows**, count only the presence of a stem containing hollows. For a **multi-stemmed tree**, only the largest stem is included in the count/estimate. **Stems may be dead and may be shrubs.**

BAM Attribute (1 x 1 m plots)	Litter cover (%)	Bare ground cover (%)	Cryptogam cover (%)	Rock cover (%)
Subplot score (% in each)	60 | 80 | 90 | 85 | 90	10 | 5 | 0 | 1 | 2		
Average of the 5 subplots	75	3.6		

Litter cover is assessed as the average percentage ground cover of litter recorded from five 1 m x 1 m plots centred at 5, 15, 25, 35, 45 m along the plot midline. Litter cover includes leaves, seeds, twigs, branchlets and branches (less than 10 cm in diameter). Assessors may also record the cover of rock, bare ground and cryptogams.

Physiography + site features that may help in determining PCT and Management Zone (optional)

Morphological Type		Landform Element	Mid-slope	Landform Pattern	Gently undulating	Microrelief	Table drain
Lithology	Sedimentary	Soil Surface Texture	Sandy Clay	Soil Colour	L. brown	Soil Depth	Mod.
Slope	<1°	Aspect	SW.	Site Drainage	Mod	Distance to nearest water and type	500m Dam

Plot Disturbance	Severity code	Age code	Observational evidence:
Clearing (inc. logging)	–		
Cultivation (inc. pasture)	–		
Soil erosion	–		
Firewood / CWD removal	1	R	Cut stumps
Grazing (identify native/stock)	–		
Fire damage	–		
Storm damage	–		
Weediness	–		
Other	–		

Severity: 0=no evidence, 1=light, 2=moderate, 3=severe

Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

Plot 2

-This document has not been endorsed or approved by Office of Environment and Heritage or Muddy Boots Environmental Training-

BAM Site – Field Survey Form | Site Sheet no:

		Survey Name	Zone ID	Recorders			
Date	1/9/21	CB Agrihub		DL, CC.			
Zone 55J	Datum GDA 94	Plot ID	210901_02	Plot dimensions	50x20	Photo #	✓
Easting 224585	Northing 6517311	IBRA region	BBS.	Midline bearing from 0 m	0°		
Vegetation Class						Confidence: H M L	
Plant Community Type	0			EEC:		Confidence: H M L	

118L
361m

Record easting and northing at 0 m on midline. Dimensions (Shape) of 0.04 ha base plot.

BAM Attribute (400 m² plot)		Sum values
Count of Native Richness	Trees	0
	Shrubs	0
	Grasses etc.	7
	Forbs	4
	Ferns	0
	Other	0
Sum of Cover of native vascular plants by growth form group	Trees	0
	Shrubs	0
	Grasses etc.	36
	Forbs	5.4
	Ferns	0
	Other	0
High Threat Weed cover		5

BAM Attribute (1000 m² plot)		
DBH	# Tree Stems Count	# Stems with Hollows
80 + cm		
50 – 79 cm		
30 – 49 cm		
20 – 29 cm		
10 – 19 cm		
5 – 9 cm		
< 5 cm		n/a
Length of logs (m) (≥10 cm diameter, >50 cm in length)		

GRAZED PADDOCK NIL

Counts apply when the **number of tree stems** within a size class is ≤ 10. Estimates can be used when > 10 (eg. 10, 20, 30..., 100, 200, 300...). For a **multi-stemmed tree**, only the largest living stem is included in the count/estimate. **Tree stems must be living.**

For **hollows**, count only the presence of a stem containing hollows. For a **multi-stemmed tree**, only the largest stem is included in the count/estimate. **Stems may be dead and may be shrubs.**

BAM Attribute (1 x 1 m plots)	Litter cover (%)	Bare ground cover (%)	Cryptogam cover (%)	Rock cover (%)
Subplot score (% in each)	15 20 15 20 15	0 1 0 2 0	20 10 5 1 3	
Average of the 5 subplots	17	0.6	8.2	

Litter cover is assessed as the average percentage ground cover of litter recorded from five 1 m x 1 m plots centred at 5, 15, 25, 35, 45 m along the plot midline. Litter cover includes leaves, seeds, twigs, branchlets and branches (less than 10 cm in diameter). Assessors may also record the cover of rock, bare ground and cryptogams.

Physiography + site features that may help in determining PCT and Management Zone (optional)

Morphological Type		Landform Element		Landform Pattern		Microrelief	
Lithology		Soil Surface Texture		Soil Colour		Soil Depth	
Slope		Aspect		Site Drainage		Distance to nearest water and type	

Plot Disturbance	Severity code	Age code	Observational evidence:
Clearing (inc. logging)	3	O	No trees.
Cultivation (inc. pasture)	2	R	Exotic grasses.
Soil erosion	–		
Firewood / CWD removal	–		
Grazing (identify native/stock)	2	R	Cattle dung.
Fire damage	-		
Storm damage	-		
Weediness	3	R	See list.
Other			

Severity: 0=no evidence, 1=light, 2=moderate, 3=severe

Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

400 m² plot: Sheet _ of _	Survey Name	Plot Identifier	Recorders
Date 1/9/21	CB Agri hub	210901-02	DL, CC.

GF Code	Top 3 native species in each growth form group: Full species name mandatory All other native and exotic species: Full species name where practicable	N, E or HTE	Cover	Abund	stratum	voucher
X	Eragrostis curvula	HTE	5	100		
X	Medicago sp.		30	500		
X	Conyza bonariensis		1	100		
G	Sporobolus creber		4	200		
G	Enteropogon acicularis		0.5	20		
F	Crassula sieberiana		5	1000		
X	Stellaria media		0.2	50		
X	Pattersons Curse		0.4	50		
X	Yellow Pea		0.1	10		
G	Eragrostis leptostachya		1	50		
G	Bothriochloa macra		0.3	20		
F	Oxalis perennans		0.1	5		
X	Chloris gayana		0.3	10		
G	Aristida ramosa		0.1	1		
F	Calotis lappulacea		0.1	10		
X	Hypochaeris radicata		0.8	500		
G	Juncus usitatus		0.1	1		
F	Wahlenbergia		0.2	10		NJD
G	Unknown grass (dead/dormant)		30	500		

GF Code: see Growth Form definitions in Appendix 1 **N:** native, **E:** exotic, **HTE:** high threat exotic **GF – circle code** if 'top 3'.

Cover: 0.1, 0.2, 0.3, ..., 1, 2, 3, ..., 10, 15, 20, 25, ...100% (foliage cover); ***Note:*** *0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m*

Abundance: 1, 2, 3, ..., 10, 20, 30, ... 100, 200, ..., 1000, ...

Plot 3

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BAM Site – Field Survey Form Site Sheet no:

		Survey Name	Zone ID	Recorders			
Date	1/9/24	CB Agri Hub		DL, CC			
Zone	Datum	Plot ID	210901_03	Plot dimensions	50x20	Photo #	
Easting	Northing	IBRA region	BBS	Midline bearing from 0 m	0°		
Vegetation Class						Confidence: H M L	
Plant Community Type		0		EEC:		Confidence: H M L	

1189 342m

Record easting and northing at 0 m on midline. Dimensions (Shape) of 0.04 ha base plot.

BAM Attribute (400 m² plot)		Sum values
Count of Native Richness	Trees	0
	Shrubs	0
	Grasses etc.	1
	Forbs	1
	Ferns	0
	Other	0
Sum of Cover of native vascular plants by growth form group	Trees	0
	Shrubs	0
	Grasses etc.	0
	Forbs	0.5
	Ferns	0
	Other	0
High Threat Weed cover		0.1

BAM Attribute (1000 m² plot)		
DBH	# Tree Stems Count	# Stems with Hollows
80 + cm	NIL - OPEN PADDOCK grazed.	
50 – 79 cm		
30 – 49 cm		
20 – 29 cm		
10 – 19 cm		
5 – 9 cm		
< 5 cm		n/a
Length of logs (m) (≥10 cm diameter, >50 cm in length)		

Counts apply when the **number of tree stems** within a size class is ≤ 10. Estimates can be used when > 10 (eg. 10, 20, 30 ... 100, 200, 300 ...). For a **multi-stemmed tree**, only the largest living stem is included in the count/estimate. **Tree stems must be living.**

For **hollows**, count only the presence of a stem containing hollows. For a **multi-stemmed tree**, only the largest stem is included in the count/estimate. **Stems may be dead and may be shrubs.**

BAM Attribute (1 x 1 m plots)	Litter cover (%)	Bare ground cover (%)	Cryptogam cover (%)	Rock cover (%)
Subplot score (% in each)	60 16 10 50 10	0 1 2 1 0	10 5 2 5 1	0 0 0 0 0
Average of the 5 subplots	28	0.8	6.6	0

Litter cover is assessed as the average percentage ground cover of litter recorded from five 1 m x 1 m plots centred at 5, 15, 25, 35, 45 m along the plot midline. Litter cover includes leaves, seeds, twigs, branchlets and branches (less than 10 cm in diameter). Assessors may also record the cover of rock, bare ground and cryptogams.

Physiography + site features that may help in determining PCT and Management Zone (optional)

Morphological Type		Landform Element	Mid slope	Landform Pattern	Gently und	Microrelief	–
Lithology	Sedimentary	Soil Surface Texture	Clayey sand	Soil Colour	Reddish brn	Soil Depth	Deep
Slope	<1°	Aspect	W	Site Drainage	Good	Distance to nearest water and type	500m Dam

Plot Disturbance	Severity code	Age code	Observational evidence:
Clearing (inc. logging)	3	O	No trees
Cultivation (inc. pasture)	3	R	
Soil erosion	–		
Firewood / CWD removal	–		
Grazing (identify native/stock)	2	R	Cattle in paddock.
Fire damage			
Storm damage			
Weediness			
Other			

Severity: 0=no evidence, 1=light, 2=moderate, 3=severe

Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

400 m² plot: Sheet _ of _	Survey Name	Plot Identifier	Recorders
Date 1/9/21	CB Agri hub.	210901-03	DC, CC.

GF Code	Top 3 native species in each growth form group: Full species name mandatory All other native and exotic species: Full species name where practicable	N, E or HTE	Cover	Abund	stratum	voucher
X	Eragrostis curvula		75	1000+		
X	Arctotheca calandula		<0.1	1		
X	~~Melilotus~~ Trifolium sp (white)		20	500		
X	Echium Patterson Curse-		0.2	10		
X	Hypochaeris radicata		2	100		
X	Conyza bonariensis		0.2	50		
X	Lepidium africanum	HTE	0.1	10		
C	Cyperus bifax		<0.1	1		
X	Stellaria media		0.1	10		
F	Crassula sieberiana		0.5	100		

GF Code: see Growth Form definitions in Appendix 1 **N:** native, **E:** exotic, **HTE:** high threat exotic **GF – circle code** if 'top 3'.

Cover: 0.1, 0.2, 0.3, …, 1, 2, 3, …, 10, 15, 20, 25, ...100% (foliage cover); ***Note:*** *0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m*

Abundance: 1, 2, 3, …, 10, 20, 30, … 100, 200, …, 1000, …

Plot 4

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BAM Site – Field Survey Form | Site Sheet no:

WP 1272

		Survey Name	Zone ID	Recorders			
Date	1/9/21	CB Agri Hub		DC, CC			
Zone	Datum	Plot ID	210901_04	Plot dimensions	50 x 20	Photo #	
Easting: 224604	Northing: 6516968	IBRA region	BBS	Midline bearing from 0 m	E 90°		
Vegetation Class						Confidence: H M L	
Plant Community Type		102		EEC:		Confidence: H M L	

Record easting and northing at 0 m on midline. Dimensions (Shape) of 0.04 ha base plot.

BAM Attribute (400 m² plot)		Sum values
Count of Native Richness	Trees	1
	Shrubs	1
	Grasses etc.	1
	Forbs	4
	Ferns	0
	Other	0
Sum of Cover of native vascular plants by growth form group	Trees	30
	Shrubs	0.2
	Grasses etc.	50
	Forbs	3.3
	Ferns	0
	Other	0
High Threat Weed cover		0.3

BAM Attribute (1000 m² plot)		
DBH	# Tree Stems Count	# Stems with Hollows
80 + cm	120 (1)	1 (1)
50 – 79 cm		
30 – 49 cm		
20 – 29 cm		
10 – 19 cm		
5 – 9 cm		
< 5 cm		n/a
Length of logs (m) (≥10 cm diameter, >50 cm in length)	16m	

Counts apply when the **number of tree stems** within a size class is ≤ 10. Estimates can be used when > 10 (eg. 10, 20, 30..., 100, 200, 300...). For a **multi-stemmed tree**, only the largest living stem is included in the count/estimate. **Tree stems must be living.**

For **hollows**, count only the presence of a stem containing hollows. For a **multi-stemmed tree**, only the largest stem is included in the count/estimate. **Stems may be dead and may be shrubs.**

BAM Attribute (1 x 1 m plots)	Litter cover (%)					Bare ground cover (%)					Cryptogam cover (%)					Rock cover (%)				
Subplot score (% in each)	10	15	10	10	10	15	10	20	15	45	0	0	0	0	0	0	0	0	0	5
Average of the 5 subplots	11					21					–					0				

Litter cover is assessed as the average percentage ground cover of litter recorded from five 1 m x 1 m plots centred at 5, 15, 25, 35, 45 m along the plot midline. Litter cover includes leaves, seeds, twigs, branchlets and branches (less than 10 cm in diameter). Assessors may also record the cover of rock, bare ground and cryptogams.

Physiography + site features that may help in determining PCT and Management Zone (optional)

Morphological Type		Landform Element		Landform Pattern		Microrelief	
Lithology		Soil Surface Texture		Soil Colour		Soil Depth	
Slope		Aspect		Site Drainage		Distance to nearest water and type	

Plot Disturbance	Severity code	Age code	Observational evidence:
Clearing (inc. logging)	2	O	Few trees.
Cultivation (inc. pasture)	3	R	Sown grasses.
Soil erosion			
Firewood / CWD removal			
Grazing (Identify native/stock)	3	R	100 cattle in paddock. Dung.
Fire damage	–		
Storm damage	–		
Weediness	–		
Other	–		

Severity: 0=no evidence, 1=light, 2=moderate, 3=severe

Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

400 m² plot: Sheet _ of _	Survey Name	Plot Identifier	Recorders
Date 1/9/21	CB Agri Hub	210901-04	

GF Code	Top 3 native species in each growth form group: Full species name mandatory All other native and exotic species: Full species name where practicable	N, E or HTE	Cover	Abund	stratum	voucher
T	Angophora floribunda		30	1	50	60
X	Arctotheca calendula		20	500		
X	Urtica urens		25	500		
G	Cynodon dactylon		50	500		
X	Bromus catharticus		0.5	100		
X	Lycium ferocissimum	HTE	0.2	1		
X	Echium vulgare		0.3	20		
X	Indian hedge mustard		<0.1	2		
X	Bidens alternans		<0.1	1		
X	Lactuca serriola		0.1	2		
F	~~Soleirogyne bellidifolia~~ Cotula australis		1	100		
F	Urtica incisa		0.3	5		
F	Rumex brownii		<0.1	1		
X	Lepidium africanus		0.1	10		
S	Maireana microphylla		0.2	2		
F	Crassula sieberiana		2	500		
X	Hypochaeris radicata		0.7	100		
X	Eragrostis curvula	HTE	0.1	1		

GF Code: see Growth Form definitions in Appendix 1 **N:** native, **E:** exotic, **HTE:** high threat exotic **GF – circle code** if 'top 3'.

Cover: 0.1, 0.2, 0.3, ..., 1, 2, 3, ..., 10, 15, 20, 25, ...100% (foliage cover); ***Note:*** *0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m*

Abundance: 1, 2, 3, ..., 10, 20, 30, ... 100, 200, ..., 1000, ...

Plot 5

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BAM Site – Field Survey Form | Site Sheet no:

		Survey Name	Zone ID	Recorders			
Date	1/9/21	CB Agri Hub		DC, CC			
Zone 55	Datum	Plot ID	210901-05	Plot dimensions	20x50	Photo #	
Easting 224792	Northing 6517004	IBRA region	BBS	Midline bearing from 0 m	0°		
Vegetation Class						Confidence: H M L	
Plant Community Type		148		EEC:		Confidence: H M L	

1273
381m

Record easting and northing at 0 m on midline. Dimensions (Shape) of 0.04 ha base plot.

BAM Attribute (400 m² plot)		Sum values
Count of Native Richness	Trees	3
	Shrubs	1
	Grasses etc.	2
	Forbs	3
	Ferns	0
	Other	0
Sum of Cover of native vascular plants by growth form group	Trees	38
	Shrubs	0.5
	Grasses etc.	92
	Forbs	1.7
	Ferns	0
	Other	0
High Threat Weed cover		0

BAM Attribute (1000 m² plot)		
DBH	# Tree Stems Count	# Stems with Hollows
80 + cm		
50 – 79 cm	(2)	
30 – 49 cm	(7)	
20 – 29 cm	(17)	
10 – 19 cm	(27)	
5 – 9 cm	(3)	
< 5 cm	0	n/a
Length of logs (m) (≥10 cm diameter, >50 cm in length)	144 m	

Counts apply when the **number of tree stems** within a size class is ≤ 10. Estimates can be used when > 10 (eg. 10, 20, 30..., 100, 200, 300...). For a **multi-stemmed tree**, only the largest living stem is included in the count/estimate. **Tree stems must be living.**

For **hollows**, count only the presence of a stem containing hollows. For a **multi-stemmed tree**, only the largest stem is included in the count/estimate. **Stems may be dead and may be shrubs.**

BAM Attribute (1 x 1 m plots)	Litter cover (%)					Bare ground cover (%)					Cryptogam cover (%)					Rock cover (%)				
Subplot score (% in each)	20	10	25	50	30	40	30	0	10	30	0	0	0	0	0	0	0	0	0	0
Average of the 5 subplots	27					22														

Litter cover is assessed as the average percentage ground cover of litter recorded from five 1 m x 1 m plots centred at 5, 15, 25, 35, 45 m along the plot midline. Litter cover includes leaves, seeds, twigs, branchlets and branches (less than 10 cm in diameter). Assessors may also record the cover of rock, bare ground and cryptogams.

Physiography + site features that may help in determining PCT and Management Zone (optional)

Morphological Type		Landform Element	Mid-slope	Landform Pattern	Gently und	Microrelief	—
Lithology	Sedimentary	Soil Surface Texture	Sand	Soil Colour	Red/brown	Soil Depth	Mod
Slope	<1°	Aspect	S	Site Drainage	Good	Distance to nearest water and type	6 km to Namoi

Plot Disturbance	Severity code	Age code	Observational evidence:
Clearing (inc. logging)	1	0	Shrubs missing
Cultivation (inc. pasture)	—		
Soil erosion	—		
Firewood / CWD removal	—		
Grazing (identify native/stock)	3	R	Cattle + dung
Fire damage			
Storm damage			
Weediness	2	R	See list
Other			

Severity: 0=no evidence, 1=light, 2=moderate, 3=severe

Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

400 m² plot: Sheet _ of _	Survey Name	Plot Identifier	Recorders
Date 1/9/21	CB Agri hub	210901-05	DL, LC

GF Code	Top 3 native species in each growth form group: Full species name mandatory All other native and exotic species: Full species name where practicable	N, E or HTE	Cover	Abund	stratum	voucher
T	Eucalyptus crebra		32	35	40	80
T	Allocasuarina luehmannii		3	3	30	10
T	Eucalyptus tonica		3	1	40	8
S	Mairetana microphylla		0.5	10		
G	Austrostipa verticillata		2	20		
X	Lepidium africanum.		0.2	10		
G	Cynodon dactlyon		90	1000+		
F	~~Parakeelya~~ Calandrinia eremaea		0.4	100		
F	Cotula australis		0.3	50		
X	Urtica urens.		1	100		
F	Linadia nutans		1	40		
X	Indian hedge mustard.		<0.1	2		
X	Arctotheca calendula.		1	50		
X	Lactuca serriola.		<0.1	1		
X	Hordeum vulgare.		<0.1	2		

GF Code: see Growth Form definitions in Appendix 1 **N:** native, **E:** exotic, **HTE:** high threat exotic **GF – circle code** if 'top 3'.

Cover: 0.1, 0.2, 0.3, …, 1, 2, 3, ..., 10, 15, 20, 25, ...100% (foliage cover); ***Note:*** *0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m*

Abundance: 1, 2, 3, …, 10, 20, 30, … 100, 200, …, 1000, …

Plot 6

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BAM Site – Field Survey Form | Site Sheet no:

		Survey Name	Zone ID	Recorders			
Date	1/9/21	CBAgriHub		DC, CC			
Zone	Datum	Plot ID	210901_06	Plot dimensions	50x20	Photo #	
55	GDA94						
Easting	Northing	IBRA region	BBS	Midline bearing from 0 m	00		
224948	6517434						
Vegetation Class						Confidence: H M L	
Plant Community Type		102		EEC:		Confidence: H M L	

Record easting and northing at 0 m on midline. Dimensions (Shape) of 0.04 ha base plot.

BAM Attribute (400 m² plot)		Sum values
Count of Native Richness	Trees	1
	Shrubs	1
	Grasses etc.	2
	Forbs	8
	Ferns	0
	Other	0
Sum of Cover of native vascular plants by growth form group	Trees	35
	Shrubs	2
	Grasses etc.	60.1
	Forbs	4.4
	Ferns	0
	Other	0
High Threat Weed cover		6

BAM Attribute (1000 m² plot)		
DBH	# Tree Stems Count	# Stems with Hollows
80 + cm	(2)	11 (2)
50 – 79 cm	–	–
30 – 49 cm	(3)	(2)
20 – 29 cm	(1)	–
10 – 19 cm	–	–
5 – 9 cm	–	–
< 5 cm	–	n/a
Length of logs (m) (≥10 cm diameter, >50 cm in length)	0m	

Counts apply when the **number of tree stems** within a size class is ≤ 10. Estimates can be used when > 10 (eg. 10, 20, 30 ..., 100, 200, 300. ..). For a **multi-stemmed tree**, only the largest living stem is included in the count/estimate. **Tree stems must be living.**

For **hollows**, count only the presence of a stem containing hollows. For a **multi-stemmed tree**, only the largest stem is included in the count/estimate. **Stems may be dead and may be shrubs.**

BAM Attribute (1 x 1 m plots)	Litter cover (%)	Bare ground cover (%)	Cryptogam cover (%)	Rock cover (%)
Subplot score (% in each)	25 2 5 2 20	20 90 70 90 10	0 0 0 0 0	0 0 0 0 0
Average of the 5 subplots	10.4	36	0	0

Litter cover is assessed as the average percentage ground cover of litter recorded from five 1 m x 1 m plots centred at 5, 15, 25, 35, 45 m along the plot midline. Litter cover includes leaves, seeds, twigs, branchlets and branches (less than 10 cm in diameter). Assessors may also record the cover of rock, bare ground and cryptogams.

Physiography + site features that may help in determining PCT and Management Zone (optional)

Morphological Type		Landform Element	Near Flat Mid	Landform Pattern	Gently und	Microrelief	–
Lithology	Sandstone	Soil Surface Texture	Clayey sand	Soil Colour	light brown	Soil Depth	Mod
Slope	<4°	Aspect	S	Site Drainage	Good	Distance to nearest water and type	500m Dam

Plot Disturbance	Severity code	Age code	Observational evidence:
Clearing (inc. logging)	1	O	
Cultivation (inc. pasture)	3	NR	Exotic pasture
Soil erosion	–		
Firewood / CWD removal	–		
Grazing (identify native/stock)	3	R	Cattle + dung
Fire damage			
Storm damage			
Weediness	3	R	
Other			

Severity: 0=no evidence, 1=light, 2=moderate, 3=severe

Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

400 m² plot: Sheet _ of _	Survey Name	Plot Identifier	Recorders
Date 1/9/21	CB Agrihub	210901-06	

GF Code	Top 3 native species in each growth form group: Full species name mandatory All other native and exotic species: Full species name where practicable	N, E or HTE	Cover	Abund	stratum	voucher
T	Eucalyptus camica		35	3	70	50
S	Mairetana myrsophylla		2	20		
G	Cynodon dactylon		60	1000T		
X	Lepidium africanus		0.1	10		
F	Calotis lappulacea		0.5	50		
F	Dysphania pumilio		0.2	10		
F	Einadia nutans		0.8	100		
F	Sclerolaena muricata		0.8	10		
F	Cotula australis		0.3	30		
F	Calandrinia eremaea		0.7	100		
F	Crassula sieberiana		1	200		
F	Wahlenbergia sp.		0.1	5		
X	Conyza bonariense		0.1	5		
X	Sida sp.		<0.1	2		
G	Bothriochloa macra		0.1	2		

GF Code: see Growth Form definitions in Appendix 1 **N:** native, **E:** exotic, **HTE:** high threat exotic **GF – circle code** if 'top 3'.

Cover: 0.1, 0.2, 0.3, ..., 1, 2, 3, ..., 10, 15, 20, 25, ...100% (foliage cover); ***Note:*** *0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m*

Abundance: 1, 2, 3, ..., 10, 20, 30, ... 100, 200, ..., 1000, ...

Plot 7

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BAM Site – Field Survey Form | Site Sheet no:

		Survey Name	Zone ID	Recorders			
Date	1/9/21	CB Agrihub		DC, CC			
Zone	Datum	Plot ID	210901_07	Plot dimensions	50x20	Photo #	
Easting	Northing	IBRA region	BDS	Midline bearing from 0 m	0°		
1275							
Vegetation Class						Confidence: H M L	
397m							
Plant Community Type		0		EEC:		Confidence: H M L	

Record easting and northing at 0 m on midline. Dimensions (Shape) of 0.04 ha base plot.

BAM Attribute (400 m² plot)		Sum values
Count of Native Richness	Trees	0
	Shrubs	1
	Grasses etc.	2
	Forbs	3
	Ferns	0
	Other	0
Sum of Cover of native vascular plants by growth form group	Trees	0
	Shrubs	0.1
	Grasses etc.	60
	Forbs	7
	Ferns	0
	Other	0
High Threat Weed cover		10

BAM Attribute (1000 m² plot)		
DBH	# Tree Stems Count	# Stems with Hollows
80 + cm		
50 – 79 cm	OPEN PADDOCK grazed.	
30 – 49 cm		
20 – 29 cm		
10 – 19 cm		
5 – 9 cm		
< 5 cm		n/a
Length of logs (m) (≥10 cm diameter, >50 cm in length)		

Counts apply when the **number of tree stems** within a size class is ≤ 10. Estimates can be used when > 10 (eg. 10, 20, 30 ..., 100, 200, 300 ...). For a **multi-stemmed tree**, only the largest living stem is included in the count/estimate. **Tree stems must be living.**

For **hollows**, count only the presence of a stem containing hollows. For a **multi-stemmed tree**, only the largest stem is included in the count/estimate. **Stems may be dead and may be shrubs.**

BAM Attribute (1 x 1 m plots)	Litter cover (%)	Bare ground cover (%)	Cryptogam cover (%)	Rock cover (%)
Subplot score (% in each)	50 20 30 10 10	5 5 5 0 0	5 5 0 5 5	0 0 0 0 0
Average of the 5 subplots	24	3	4	0

Litter cover is assessed as the average percentage ground cover of litter recorded from five 1 m x 1 m plots centred at 5, 15, 25, 35, 45 m along the plot midline. Litter cover includes leaves, seeds, twigs, branchlets and branches (less than 10 cm in diameter). Assessors may also record the cover of rock, bare ground and cryptogams.

Physiography + site features that may help in determining PCT and Management Zone (optional)

Morphological Type		Landform Element	Mid	Landform Pattern	Gent Und	Microrelief	—
Lithology	Sandstone	Soil Surface Texture	Sand	Soil Colour	Yellow-brn	Soil Depth	Deep
Slope	1°	Aspect	W	Site Drainage	Enc	Distance to nearest water and type	600m Dam

Plot Disturbance	Severity code	Age code	Observational evidence:
Clearing (inc. logging)	3	O	No trees
Cultivation (inc. pasture)	3	NR	ALG
Soil erosion	–		
Firewood / CWD removal	–		
Grazing (identify native/stock)	3	R	cattle + dung
Fire damage			
Storm damage			
Weediness	3	R	
Other			

Severity: 0=no evidence, 1=light, 2=moderate, 3=severe

Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

400 m² plot: Sheet _ of _	Survey Name	Plot Identifier	Recorders
Date 1/5/24	Agri Hub	210901-07	

GF Code	Top 3 native species in each growth form group: Full species name mandatory All other native and exotic species: Full species name where practicable	N, E or HTE	Cover	Abund	stratum	voucher
X	Eragrostis curvula.	HTE	10	200		
G	Sporobolus creber.		50	1000T		
F	Calotis lappulacea		1	50		
X	Conyza bonariensis.		0.1	20		
F	Cotula australis.		5	500		
X	Hypochaeris radicata		2	100		
X	Lepidium africanum.		1	50		
G	Cynodon dactylon.		10	100		
X	Trifolium arvense cv		8	200		
F	Crassula sieberiana.		1	300		
S	Sclerolaena birchii.		0.1	2		
X	Centaurea solstitialis.		0.5	5		
X	Stellaria media		0.7	50		

GF Code: see Growth Form definitions in Appendix 1 **N:** native, **E:** exotic, **HTE:** high threat exotic **GF – circle code** if 'top 3'.

Cover: 0.1, 0.2, 0.3, ..., 1, 2, 3, ..., 10, 15, 20, 25, ...100% (foliage cover); ***Note:*** *0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m*

Abundance: 1, 2, 3, ..., 10, 20, 30, ... 100, 200, ..., 1000, ...

Plot 8

BAM Site – Field Survey Form | Site Sheet no:

		Survey Name	Zone ID	Recorders			
Date	1 9 21	Cb Agrihub	Poor	DC, CC			
Zone 56J	Datum GDA 94	Plot ID	210901-08	Plot dimensions	50x20	Photo #	11
Easting 224725	Northing 6517226	IBRA region	BBS	Midline bearing from 0 m	0°		
Vegetation Class						Confidence: H M L	
Plant Community Type		0		EEC: No		Confidence: H M L	

Record easting and northing at 0 m on midline. Dimensions (Shape) of 0.04 ha base plot.

BAM Attribute (400 m² plot)		Sum values
Count of Native Richness	Trees	0
	Shrubs	1
	Grasses etc.	2
	Forbs	1
	Ferns	0
	Other	0
Sum of Cover of native vascular plants by growth form group	Trees	0
	Shrubs	4
	Grasses etc.	7
	Forbs	0.2
	Ferns	0
	Other	0
High Threat Weed cover		40

BAM Attribute (1000 m² plot)		
DBH	# Tree Stems Count	# Stems with Hollows
80 + cm		
50 – 79 cm		
30 – 49 cm	Grazed Paddock	
20 – 29 cm		
10 – 19 cm		
5 – 9 cm		
< 5 cm		n/a
Length of logs (m) (≥10 cm diameter, >50 cm in length)	0	

Counts apply when the **number of tree stems** within a size class is ≤ 10. Estimates can be used when > 10 (eg. 10, 20, 30..., 100, 200, 300...). For a **multi-stemmed tree**, only the largest living stem is included in the count/estimate. **Tree stems must be living.**

For **hollows**, count only the presence of a stem containing hollows. For a **multi-stemmed tree**, only the largest stem is included in the count/estimate. **Stems may be dead and may be shrubs.**

BAM Attribute (1 x 1 m plots)	Litter cover (%)					Bare ground cover (%)					Cryptogam cover (%)					Rock cover (%)				
Subplot score (% in each)	15	0	40	10	40	5	10	5	5	10	0	0	0	0	0	0	0	0	0	0
Average of the 5 subplots	21					7					0					0				

Litter cover is assessed as the average percentage ground cover of litter recorded from five 1 m x 1 m plots centred at 5, 15, 25, 35, 45 m along the plot midline. Litter cover includes leaves, seeds, twigs, branchlets and branches (less than 10 cm in diameter). Assessors may also record the cover of rock, bare ground and cryptogams.

Physiography + site features that may help in determining PCT and Management Zone (optional)

Morphological Type	–	Landform Element	Mid Sl	Landform Pattern	Gently und	Microrelief	–
Lithology	Sandstone.	Soil Surface Texture	Sand	Soil Colour	Yellow-Brn	Soil Depth	Deep
Slope	1°	Aspect	W	Site Drainage	Good	Distance to nearest water and type	500m Dam

Plot Disturbance	Severity code	Age code	Observational evidence
Clearing (inc. logging)	3	O	No trees
Cultivation (inc. pasture)	3	NR	Cultivation lines.
Soil erosion	1	R	
Firewood / CWD removal	–		
Grazing (identify native/stock)	3	R	Cattle.
Fire damage			
Storm damage			
Weediness	3	R	See list.
Other			

Severity: 0=no evidence, 1=light, 2=moderate, 3=severe

Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

400 m² plot: Sheet _ of _	Survey Name	Plot Identifier	Recorders
Date 1/9/21	Agrihub	210901-08	DC, CC

GF Code	*Top 3 native species in each growth form group: Full species name mandatory All other native and exotic species: Full species name where practicable*	N, E or HTE	Cover	Abund	stratum	voucher
X	Eragrostis curvula	HTE	40	1000+		
X	Hypochaeris radicata		1	50		
G	Cynodon dactylon		5	100		
F	Crassula sieberiana		0.2	100		
S	Sclerolaena birchii		4	40		
G	Sporobolus creber		2	30		
X	Conyza bonariensis		2	100		
X	Trifolium arvense		10	300		

GF Code: see Growth Form definitions in Appendix 1 **N:** native, **E:** exotic, **HTE:** high threat exotic **GF – circle code** if 'top 3'.

Cover: 0.1, 0.2, 0.3, ..., 1, 2, 3, ..., 10, 15, 20, 25, ...100% (foliage cover); ***Note:*** *0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m*

Abundance: 1, 2, 3, ..., 10, 20, 30, ... 100, 200, ..., 1000, ...

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Bushfire Attack Level (BAL) Hazard Assessment report

Determined in accordance with *Planning for Bushfire Protection* 2019 and AS 3959-2018

This Bushfire Attack Level (BAL) Assessment Report has been prepared by a person accredited by Fire Protection Association Australia under the Bushfire Planning and Design (BPAD) Accreditation Scheme.

This proposal has been prepared in accordance with PBP 2019 in its entirety and the development complies with all relevant Acceptable Solutions in PBP2019

Site Details

Address:	5387 Coonabarabran Road (Lot 1632, DP 801779)		
Suburb:	Yannergee	State:	NSW
Local Government Area:	Liverpool Plains Shire Council		
Report / Job Number:	ARM 21/61	Report Date:	17/08/2022

Bushfire Hazard Assessment

Vegetation Classification	Effective Slope	Separation Distance	BAL
Forest (east, south and north)	upslope	>20 metres	BAL-29
Forest (west)	0-<5° down	>25 metres	BAL-29

BPAD Accredited Practitioner Details

Name: **Stephen Cotter**

Accreditation Number: **BPAD20505** **Accreditation Expiry Date:** **31/05/2023**

Signature: 

BUSHFIRE HAZARD ASSESSMENT

COTTON GIN DEVELOPMENT

5387 COONABARABRAN ROAD, YANNERGEE

17TH AUGUST 2022

REPORT PREPARED FOR AGRI HUB P/L

TABLE OF CONTENTS

EXECUTIVE SUMMARY

Agri Hub P/L has requested a bushfire hazard assessment and report that fully considers the site-specific parameters and vegetation structure of any bushfire hazard that would impact the proposed cotton gin and module storage areas in accordance with section 4.47 of the Environmental Planning & Assessment Act (1979). The assessment followed the guidelines recommended in Planning for Bushfire Protection (PBP2019) and AS 3959-2018 Construction of buildings in bushfire prone areas (AS3959-2018).

Property Description

The subject site is part of a large rural grazing property located to the northwest of the Colly Blue settlement area and bound by Wandobah Rd (all-weather unsealed road) and Coonabarabran Road (sealed). The site is cleared grazing land with isolated shade trees and includes a mixture of native grasses and introduced pasture. Aerial imagery indicates that part of the subject site was used to produce cereal crops.

The subject property is zoned RU1 'Primary Production' in the Liverpool Plains Local Environmental Plan (Liverpool Plains Shire Council, 2011) and is surrounded by rural grazing land. Where land has not been cleared for livestock grazing, areas of retained vegetation are present, particularly to the north and east of the subject site and in a narrow strip along Wandobah Road

The development proposal is for the construction of a cotton gin in several stages that will cover an area of approximately 46 Ha. The main cotton gin, shed, car and truck parking and turnaround around area for with heavy vehicle access from Wandobah Road shall be located in the central part of the large grazing paddock.

Vegetation assessment

This Bushfire Risk Assessment was conducted through an on-site inspection undertaken on 1st September 2021 using the methodology set out in PBP. The on-site assessment included traversing the subject property and all lands within 140 metres from the proposed development. The property inspection identified forest areas surrounding the development as bushfire prone vegetation within 140m affecting these buioldings. The table below summarises the slope assessments for each vegetation community observed over the subject land.

Aspect	Vegetation	Classification (PBP / AS 3959-2018)	Slope	Comments
N	Forest	Forest	Upslope	.
S	Grassland	Grassland	Flat	
E	Forest	Forest	Upslope	
W	Forest	Forest	0-<5° Down	

Services

All new water and electricity connections shall be installed underground.

To achieve the objectives in PBP2019 for water supply, a minimum storage of 20,000L is required. The water tank is to be made of metal, with 65mm metal Storz outlet and gate or ball valve and installed and dedicated for fire-fighting purposes. The gate or ball valve, pipes and tank penetrations are to be designed to allow for a full 50mm inner diameter water flow through the Storz fitting and shall be made from metal. The water tank is to be located within the APZ; accessible by fire-fighting appliances; a blue SWS sign placed at entry to facility and the location of water tank recorded on RFS database.

If additional water storage is required for a spray system to provide ember suppression within the cotton module yard, any tanks installed should also be made of metal with appropriate connections and access for RFS vehicles. A minimum of a 137kL is advised to allow ember protection during and after the passage of any bushfire. Additionally, drainage of the cotton module yard should allow surface water to flow to a property dam to provide additional water supply.

Any reticulated or bottled gas is installed and maintained in accordance with AS/NZS 1596.2014. All fixed gas cylinders are kept clear of flammable materials to a distance of 10 metres and shielded on the hazard side.

Bush Fire Attack Level

An assessment of the bushfire attack level applicable to the proposed development was carried out using the methodology detailed in Appendix 1 of PBP2019 and AS 3959-2018 to ascertain the viability of the development in the protection of life and property in a bush fire situation.

*The facility was assessed as having a **BAL-29** bushfire attack level.*

- *The property is in FDI 80 region*
- *Forest occurs upslope to the east and north, separated by at least 20 metres.*
- *Forest occurs on 0-<5° down to the west, separated by at least 25 metres.*
- *Grassland occurs to the south, separated by at least 20 metres*

Access

The access to the facility is designed to provide site access for heavy vehicles from Wandobah Road and shall allow vehicles to circulate around the cotton module yard. Internal roads are provided for machinery to deliver the modules to the cotton gin. A separate area is allocated for loading of vehicles with any finished products.

Car parking areas for employees of the facility is provided and can form part of the APZ around the cotton gin facility.

As heavy vehicles (B-Double Trucks, etc.) will access the facility, all roads should be a minimum of 10 metres in width and provide adequate turning area and passing areas. This shall exceed any performance requirements outlined in PBP2019.

Construction Standards

The proposed development does not include any dwelling and hence does not have any specific bushfire construction requirements.

*The cotton gin buildings can provide a safe refuge for employees during the passage of a bushfire and may form an integral part of any emergency management. Each building is located greater than 137 metres from any bushfire hazard and hence would satisfy the requirement of a neighbourhood safer place where the radiant heat load at these buildings is less than 2kW/m^2. One of these buildings should be constructed to the level of **BAL-12.5** and provide adequate ember protection to be used as a refuge or place of last resort.*

RECOMMENDATIONS

- *The entire development site shall be managed as an Inner Protection Area according to Appendix 4 of PBP2019 to provide separation from bushfire prone vegetation.*
- *A separation distance of at least 20 metres to the north, east and south and 25 metres to the west is provided from the bushfire hazard.*
- *A minimum of 20,000 L is provided for bushfire protection in accordance with PBP2019 requirements. Additions supplies are advised for ember protection of the cotton modules*
- *Property access shall exceed any provisions in PBP2019 for property access road.*
- *One of the proposed buildings shall be constructed in accordance with section 3 and 5 of AS3959-2018 (**BAL-12.5**) to provide a safe refuge to shelter during a bushfire emergency.*
- *A Bushfire Emergency Management and Evacuation Plan should be prepared as a consent condition and approved prior to the operation of the facility. This plan would form part of the environmental management plan for the site.*

1. INTRODUCTION

1.0 Scope of the report

A bushfire assessment report is a strategic document which provides detailed information that demonstrates how a proposed development on bushfire prone land in NSW will achieve the performance criteria outlined in *Planning for Bushfire Protection* 2019 (PBP2019).

The proposed cotton gin is a facility that falls within Class 5-8 buildings under the building classification system within the National Construction Code (NCC). As the NCC does not provide for any bushfire specific performance requirements for these particular classes of buildings, AS 3959-2018 or the NASH Standard are not considered as a set of Deemed to Satisfy provisions. However, as the proposed development is located on assessed bushfire prone land in NSW, the aims of objectives of *Planning for Bushfire Protection 2019* (PBP2019) must be considered.

The following objectives shall be applied in relation to access, water supply and services, and emergency and evacuation planning:

a) To provide safe access to/from the public road system for firefighters providing property protection during the bushfire and for occupant egress for evacuation.

b) To provide suitable emergency and evacuation (and relocation) arrangements for occupants of the development.

c) To provide adequate services of water for the protection of buildings during and after the passage of a bushfire and to locate gas and electricity so as not to contribute to the risk of fire to the building, and.

d) Provide for the storage of hazardous materials away from the hazard wherever possible.

1.1 Background

Agri Hub P/L has requested a bushfire hazard assessment and report that fully considers the site-specific parameters and vegetation structure of any bushfire hazard that would impact the proposed cotton gin and module storage areas in accordance with section 4.47 of the *Environmental Planning & Assessment Act* (1979). The assessment followed the guidelines recommended in *Planning for Bushfire Protection* (PBP2019) and AS 3959-2018 *Construction of buildings in bushfire prone areas* (AS3959-2018).

Preliminary discussions with Liverpool Shire Council officers have indicated that vegetation mapped as category 1 bushfire prone land occurs within the strip of public reserve along Wandobah Road to the west and retained forest vegetation surrounding Colly Blue Mountain to the east and north. As such, Liverpool Plains staff have indicated that a bushfire hazard assessment and report will be required as part of the development application and assessed in the Statement of Environmental Effects.

1.2 Description of property

The subject site is part of a large rural grazing property located to the northwest of the Colly Blue settlement area and bound by Wandobah Rd (all-weather unsealed road) and Coonabarabran Road (sealed). The site is cleared grazing land with isolated shade trees and includes a mixture of native grasses and introduced pastures. Aerial imagery indicates that part of the subject site was used to produce cereal crops (Figure 1).

The subject property is zoned RU1 ‘Primary Production’ in the Liverpool Plains Local Environmental Plan (Liverpool Plains Shire Council, 2011).

1.2.1 Surrounding land use

The subject site is surrounded by rural grazing land. Where land has not been cleared for livestock grazing, areas of retained vegetation are present, particularly to the north and east of the subject site and in a narrow strip along Wandobah Road

Figure 1: Aerial image showing the outline of the development proposal, surrounded by existing rural properties to the north, west and south and forested land to the east.

1.3 Proposal

The development proposal is for the construction of a cotton gin and module yard in several stages that will cover an area of approximately 46 Ha. The main cotton gin, shed, car and truck parking and turnaround around area for with heavy vehicle access from Wandobah Road shall be located in the central part of the large grazing paddock. A preliminary concept plan is shown in Figure 2.

Figure 2: Preliminary concept of the proposed facility.

2. VEGETATION CLASSIFICATION

The vegetation of the subject property and adjacent properties up to 140m (where practicable) from the proposed development was assessed during a site visit on 1st September 2021. The vegetation communities present were identified and classified into formations as described in Keith (2004).

Appendix 1 of PBP2019 outlines the methodology for determining the predominant bushfire prone vegetation to the distance of at least 140 metres in all directions from the site of the proposed development. Vegetation is classified using Keith (2004) with reference to Figures A1.2 of PBP2019 that classifies vegetation types into the following groups:

(a) Rainforest

(b) Wet Sclerophyll Forests

(c) Dry Sclerophyll Forests

(d) Woodlands

(e) Tall Heath

(f) Short Heath

(g) Grassland

2.1 Vegetation communities present surrounding the proposed development

Community 1 Grassland: The entire subject site is managed as grassland and regularly grazed by livestock. Previous cereal cropping of part of this land has occurred, clearing the majority of overstorey vegetation (Figure 3).

Community 2 Forest: A strip of forest vegetation (Buloke and Ironbark with a grassy understorey) occurs to the west of the subject site in a less than 100m wide strip along Wandobah Road (Figure 4). This vegetation is assessed as North West Slopes dry sclerophyll forest (grassy understorey) with a surface fuel load of 14t/Ha and overall fuel load (surface and elevated) of 24.47 t/Ha.

Similar dry sclerophyll forest vegetation occurs in large patches of retained vegetation to the north and east of the subject site. In these areas, Cypress Pine dominates the canopy with Buloke and Ironbark and a more diverse shrub layer due to the exclusion of livestock grazing (Figure 4).

2.2 assessed bushfire prone vegetation affecting the proposed development

The forest vegetation along Wandobah Road and to the north and east of the subject site was assessed as the bushfire prone vegetation impacting on the proposed development.

Figure 3a: View to west from site towards Wandobah Road.

Figure 3b: View to east towards retained forest vegetation.

Figure 3c: View to south showing previously cropped land.

Figure 3d: Single trees retained for shelter in grazing land

Figure 4a: Open Buloke Forest along Wandobah Road.

Figure 4b: The forest vegetation to east is dominated by Cypress Pine.

Figure 4c: Buloke forest comprises open grass understorey without shrubs

Figure 4d: Diverse shrub layer exists in un-grazed Cypress pine vegetation.

3. LANDFORM ASSESSMENT

Appendix 1 of PBP2019 indicates that slopes should be assessed, over a distance of at least 100m from a development site and that the dominant gradient of the land should be determined on the basis for which will most significantly influence the fire behaviour at the site. Using published topographic maps and preliminary survey plans to inform the on-site assessment, the following landforms were present over the subject land. The subject site is generally with a slight slope towards Moreduval Hut Creek to the west and rising upslope towards Colly Blue Mountain to the east and north.

Table 1 summarises the slope assessments for each vegetation community observed surrounding the proposed buildings. This information will be used as the basis for determining those aspects of the proposed development that may require provisions for, and implementation of appropriate Asset Protection Zones (APZ).

Table 1: Site Assessment Summary – vegetation communities

Aspect	Vegetation	Classification (PBP / AS 3959-2018)	Slope	Comments
N	Forest	Forest	Upslope	.
S	Grassland	Grassland	Flat	
E	Forest	Forest	Upslope	
W	Forest	Forest	0-<5° Down	

4. BUSHFIRE PROTECTION MEASURES

The following bushfire assessment follows the methodology outlined in AS 3959-2018 *Construction of buildings in bushfire prone areas* and PBP 2019. The bushfire protection measures are proposed for the gin and associated buildings to achieve compliance with the aims and objectives and the measures recommended in Section 8 Other Development in PBP2019.

4.1 Asset Protection Zones

Based on the assessment of the vegetation communities and slopes present on and adjacent to the subject property; the entire development site shall be maintained as the APZ to provide a separation from any bushfire prone vegetation.

The APZ shall extend a minimum of 20 metres to the north, east and south and 25 metres to the west as measured from the perimeter of the development footprint to provide adequate separation from any assessed bushfire prone vegetation. This shall meet the APZ requirements outlined in Table A1.12.3 of PBP2019.

The APZ shall be maintained to the standard of an Inner Protection Area (IPA) including:

- Only minimal bushfire fuel is present at ground level
- vegetation does not provide a path for the transfer of fire to the development
- trees are a minimum of 5 metres away from any building, measured from the edge of the foliage to the roof line
- bark chips and the like are not present within 5 metres of any building
- any trees present have a minimum canopy separation of 2 metres and
- any trees present are not species that retain dead material or deposit excessive amounts of ground fuel in a short time.

Should the cotton gin and module yard be developed in stages, the entire development site shall be maintained to the standard of an APZ until fully developed.

4.2 Services (Electricity Supply, Water, Gas)

All new water and electricity connections shall be installed underground.

To achieve the objectives in PBP2019 for water supply, a minimum storage of 20,000L is required. The water tank is to be made of metal, with 65mm metal Storz outlet and gate or ball valve and installed and dedicated for fire-fighting purposes. The gate or ball valve, pipes and tank penetrations are to be designed to allow for a full 50mm inner diameter water flow through the Storz fitting and shall be made from metal. The water tank is to be located within the Asset Protection Zone; accessible by fire-fighting appliances; a blue SWS sign placed at entry to facility and the location of water tank recorded on RFS database.

If additional water storage is required for a spray system to provide ember suppression within the cotton gin and module yard, any tanks installed should also be made of metal with appropriate connections and access for RFS vehicles. A minimum of a 137kL is advised to allow ember protection during and after the passage of any bushfire.

Additionally, drainage of the cotton module yard should allow surface water to flow to a property dam to provide additional water supply.

Any reticulated or bottled gas is installed and maintained in accordance with AS/NZS 1596.2014. All fixed gas cylinders are kept clear of flammable materials to a distance of 10 metres and shielded on the hazard side.

4.3 Public Road Capacity to Handle Increased Volumes of Traffic during a Bushfire Emergency

The public roads (Wandobah Road, Coonabarabran Road) in the vicinity of the subject property are adequate to handle increased volumes of traffic in a bushfire emergency. These roads;

- have an all-weather surface;
- are two-way, allowing traffic to pass in opposite directions; and
- have the capacity to carry fully loaded fire fighting vehicles
- allow occupants to evacuate away from any bushfire

4.4 Adequacy of Access and Egress in Bushfire Situations

The access to the facility is designed to provide site access for heavy vehicles from Wandobah Road and shall allow vehicles to circulate around the cotton module yard. Internal roads are provided for machinery to deliver the modules to the cotton gin. A separate area is allocated for loading of vehicles with any finished products.

Car parking areas for employees of the facility is provided and can form part of the APZ around the cotton gin facility.

As heavy vehicles (B-Double Trucks, etc.) will access the facility, all roads should be a minimum of 10 metres in width and provide adequate turning area and passing areas. This shall exceed any performance requirements outlined in PBP2019.

4.5 Assessed Bushfire Attack Level

An assessment of the bushfire attack level applicable to the proposed development was carried out using the methodology detailed in Appendix 1 of PBP2019 and AS 3959-2018 to ascertain the viability of the development in the protection of life and property in a bush fire situation.

The facility was assessed as having a **BAL-29** bushfire attack level.

- The property is in FDI 80 region
- Forest occurs upslope to the east and north, separated by at least 20 metres.
- Forest occurs on 0-<5° down to the west, separated by at least 25 metres.
- Grassland occurs to the south, separated by at least 20 metres

4.6 Bushfire Construction Standards

The proposed development does not include any dwelling and hence does not have any specific bushfire construction requirements.

The cotton gin buildings can provide a safe refuge for employees during the passage of a bushfire and may form an integral part of any emergency management. Each building is located greater than 137 metres from any bushfire hazard and hence would satisfy the requirement of a neighbourhood safer place where the radiant heat load at these buildings is less than 2kW/m^2. One of these buildings should be constructed to the level of **BAL-12.5** and provide adequate ember protection to be used as a refuge or place of last resort.

4.7 Landscaping and property maintenance – Bushfire provisions

The principles of landscaping for bush fire protection are to prevent flame impingement on the building; provide a defendable space for property protection; reduce fire spread; deflect and filter embers; provide shelter from radiant heat; and reduce wind speed. Careful consideration

of the species selection, their location relative to their flammability, and on-going maintenance to readily remove flammable fuels (leaf litter, twigs and debris) is critical to providing for bushfire protection (RFS, 2019). The following measures should be considered:

- No canopy trees shall be located within 2 metres of the proposed building.
- All bark and leaf litter should be removed from beneath any planted trees prior to the bushfire danger period to ensure that there is no accumulation of surface fuel.
- Combustible mulches should not be used within any garden within five metres of any building.
- Species used in the landscaping shall be low flammability plants that do not encourage the spread of any bushfire to the buildings.

5. BUSHFIRE EMERGENCY MANAGEMENT AND EVACUATION PLAN

To address the requirement for emergency management of the facility during a bushfire, a bushfire emergency management and evacuation plan should be prepared for the cotton gin facility in accordance with AS3745.2000 *Planning for emergencies in facilities* and the NSW RFS document: *A guide to developing a bushfire emergency management and evacuation plan*.

The use of one of the cotton gin buildings as a refuge area to shelter during the passage of a bushfire should be a key part of the emergency management plan. As such, providing ember protection for this building will satisfy the performance requirements for a neighbourhood safer place and comply with current emergency management recommendations.

The preparation and acceptance of the Bushfire Emergency Management and Evacuation Plan should be a condition of consent and approved by the principal certifying authority prior to the operation of the cotton gin facility. This plan would form part of the environmental management plan for the site.

6. RECOMMENDATIONS

- The entire development site shall be managed as an Inner Protection Area according to Appendix 4 of PBP2019 to provide separation from bushfire prone vegetation.
- A separation distance of at least 20 metres to the north, east and south and 25 metres to the west is provided from the bushfire hazard.
- A minimum of 20,000 L is provided for bushfire protection in accordance with PBP2019 requirements. Additions supplies are advised for ember protection of the cotton modules
- Property access shall exceed any provisions in PBP2019 for property access road.
- One of the proposed buildings shall be constructed in accordance with section 3 and 5 of AS3959-2018 (**BAL-12.5**) to provide a safe refuge to shelter during a bushfire emergency.
- A Bushfire Emergency Management and Evacuation Plan should be prepared as a consent condition and approved prior to the operation of the facility. This plan would form part of the environmental management plan for the site.

7. EXTENT OF COMPLIANCE AND/OR DEVIATION FROM SPECIFICATIONS

The proposed development will comply with the minimum requirements for:

1. The provision of a defendable space as Asset Protection Zone for the proposed building shall meet the minimum that is required in AS 3959-2009 for **BAL-29**.
2. Provision of Water Supply in accordance with Table 7.4a of PBP2019.
3. Access arrangements in accordance with section Table 5.3b of PBP2019.
4. Construction of a shelter in place refuge building in accordance with AS 3959-2018 (Section 3 and 5).
5. Provision of emergency management planning

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GLOSSARY

APZ	Asset Protection Zone
BFRMP	Bushfire Risk Management Plan
EP&A	Environmental Planning and Assessment Act
IPA	Inner Protection Area
LGA	Local Government Area
OPA	Outer Protection Area
PBP	Planning for Bushfire Protection document
RFS	Rural Fire Service of New South Wales
SEPP	State Environmental Planning Policy