Gunnedah
Shire Council
Open New Horizons

PUBLIC EXHIBITION OF PLANNING PROPOSAL

Notice is hereby given that a Planning Proposal is being placed on public exhibition. The Planning Proposal seeks to amend the Gunnedah Local Environmental Plan 2012 (Gunnedah LEP 2012).

SUBJECT LAND:
Lots 27 and 28 DP 755474, 210 Bushs Lane, Gunnedah

PROPOSAL:
The planning proposal aims to rezone the parcel of land from RU4 Primary Production Small Lots to R5 Large Lot Residential and to apply a minimum lot size of 9,000m².

INTENDED OUTCOME OF PROPOSAL:
The Planning Proposal seeks to make the following amendments:

a) Amend the Land Zoning Map (LZN_005A) to rezone Lots 27 and 28 DP 755474 – 210 Bushs Lane, Gunnedah from RU4 Primary Production Small Lots to R5 Large Lot Residential; and
b) Amend the Lot Size Map (LSZ_005A) to apply a minimum lot size restriction of 9,000m² to Lot 27 and 28 DP 755474 – 210 Bushs Lane, Gunnedah.

DETAILS OF EXHIBITION:
The Planning Proposal and supporting documentation will be on public exhibition during office hours (9am - 4pm) at Council's Administration Building, 63 Elgin Street, Gunnedah. The information will also be available on Council's website at www.gunnedah.nsw.gov.au

Written or electronic submissions are invited during the public exhibition period. The exhibition period ends on **Friday, 6 October 2023.**

Gunnedah Shire Council has been authorised to be the Local Plan Making Authority for this Planning Proposal. As such, persons wishing to make a submission should do so in writing and address to: General Manager, Gunnedah Shire Council, PO Box 63, GUNNEDAH NSW 2380 or email council@infogunnedah.com.au.

It should be noted that you may request that your name and address not be disclosed (by stating prominently "OBJECTION IN CONFIDENCE" on your submission) for reason that disclosure would result in detriment to you, however, Council may be obliged to release details of your complaint excluding your personal information under the Government Information (Public Access) Act 2009 even if these words are used in the submission. Further, submissions that do not contain the author's name and address may not be considered as Council will be unable to validate their authenticity.

Further information may be obtained from Council's Strategic Planning Team on 02 6740 2100.

Eric Groth
GENERAL MANAGER

Gateway Determination

Planning proposal (Department Ref: PP-2022-383): *to rezone Lots 27 and 28 DP 755474, 210 Bushs Lane, Gunnedah from RU4 Primary Production Small Lots to R5 Large Lot Residential and amend the minimum lot size.*

I, the Director, Northern Region at the Department of Planning and Environment, as delegate of the Minister for Planning and Public Spaces, have determined under section 3.34(2) of the *Environmental Planning and Assessment Act 1979* (EP&A) that an amendment to the Gunnedah Local Environmental Plan 2012 to rezone Lots 27 and 28 DP 755474, 210 Bushs Lane, Gunnedah from RU4 Primary Production Small Lots to R5 Large Lot Residential and amend the minimum lot size should proceed subject to the following conditions:

The Council as planning proposal authority is authorised to exercise the functions of the local plan-making authority under section 3.36(2) of the EP&A Act subject to the following:

(a) the planning proposal authority has satisfied all the conditions of the gateway determination;

(b) the planning proposal is consistent with applicable directions of the Minister under section 9.1 of the EP&A Act or the Secretary has agreed that any inconsistencies are justified; and

(c) there are no outstanding written objections from public authorities.

The LEP should be completed within six months from the date of the Gateway determination.

Gateway Conditions

1. Prior to agency and community consultation the planning proposal is to be amended to:

   (a) update the objectives and intended outcomes of the proposal to remove reference to the draft Gunnedah Shire Local Housing Strategy;
   (b) remove references to the New England North West Regional Plan 2036 and address the New England North West Regional Plan 2041;
   (c) address the Gunnedah Local Environmental Study (Bridging Report) 2010 which incorporates the Gunnedah Shire Rural Lands Strategy 2007;
   (d) remove references to and any mapping related to the concept subdivision;
   (e) extend the proposed land zoning and minimum lot size to the Robert Gordon Road, road reserve adjoining the land;
   (f) update the project timeframe table; and
   (g) address consolidated State Environmental Planning Policies.

2. Public exhibition is required under section 3.34(2)(c) and clause 4 of Schedule 1 to the Act as follows:

   (a) the planning proposal is categorised as standard as described in the *Local Environmental Plan Making Guidelines* (Department of Planning and Environment, 2022) and must be made publicly available for a minimum of 20 working days; and

(b) the planning proposal authority must comply with the notice requirements for public exhibition of planning proposals and the specifications for material that must be made publicly available along with planning proposals as identified in *Local Environmental Plan Making Guidelines* (Department of Planning and Environment, 2022).

3. Consultation is required with the following public authorities and government agencies under section 3.34(2)(d) of the Act and/or to comply with the requirements of applicable directions of the Minister under section 9 of the EP&A Act:

- Red Chief Local Aboriginal Land Council
- Heritage NSW
- Transport for NSW
- NSW Department of Primary Industries – Agriculture
- Biodiversity and Conservation Division
- NSW Natural Resources Access Regulator
- Mining, Exploration and Geoscience

Each public authority is to be provided with a copy of the planning proposal and any relevant supporting material via the NSW Planning Portal and given 30 days to comment on the proposal.

4. A public hearing is not required to be held into the matter by any person or body under section 3.34(2)(e) of the EP&A Act. This does not discharge Council from any obligation it may otherwise have to conduct a public hearing (for example, in response to a submission or if reclassifying land).

Dated 28 day of June 2023.

Jeremy Gray
Director, Northern Region
Local and Regional Planning
Department of Planning and Environment

Delegate of the Minister for Planning and Public Spaces

Gunnedah
Shire Council

Planning Proposal/Gateway Application

Made under the Environmental Planning and Assessment Act 1979

LAST UPDATED 21 MAY 2019

Date: .....

APPLICANT DETAILS

Name: Jarad Ewing C/- Stewart Surveys

Mailing Address: [redacted]

Suburb: Gunnedah State: NSW Postcode: 2380

Telephone: [redacted] Mobile: .....

Email: [redacted]

DETAILS OF THE LAND OWNER

Name: JREWING SUPERANNUAN FUND

Mailing Address: [redacted]

Suburb: Gunnedah State: NSW Postcode: 2380

Telephone: [redacted] Mobile: .....

Email: [redacted]

LAND TO BE DEVELOPED

Address: 210 Bushs Lane, Gunnedah

Lot No: 27 & 28 DP/MPS No: DP755474 Parish: Gunnedah

FULL DESCRIPTION OF PLANNING PROPOSAL

To amend the Gunnedah Local Environmental Plan, 2012 to enable the redevelopment of Lots 27 & 28 in DP755474, for Large Lot Residential holdings with a minimum lot size of 9000m².

APPLICANT'S DECLARATION

I/We the undersigned hereby apply for development consent and a construction certificate in relation to the development proposal described hereon and in the plans, specifications and documents accompanying the application.

I/We undertake to develop in accordance with the development consent approval granted by Council and conform with the provisions of the relevant Acts, Regulations, Codes and Local Environmental Plan.

Name(s) Jarad Ewing

Office (e.g. Director): Director [redacted]

Signature(s): [redacted] Date: 2/2/22

PO Box 63 (63 Elgin Street) Gunnedah NSW 2380
T +61 2 6740 2100 E council@infogunnedah.com.au
www.gunnedah.nsw.gov.au

Gunnedah
Shire Council

OWNER'S DECLARATION

I/We further undertake to indemnify against all claims arising from negligence (or otherwise) resulting from work carried out in connection with the development within the road reserve.

I/ We the undersigned are the owner(s) of the property described in this application and consent to its lodgement.

I/We hereby permit and duly authorise officers of the Gunnedah Shire Council to enter the land or premises to Carry out inspections and surveys or take measurements or photographs as required for the administration of the Act(s), Regulations or Planning Instrument.

Name(s) Jarad Ewing

Office (e.g. Director): Land Owner

Signature: [redacted] Date: 2/2/22

DISCLOSURE OF POLITICAL DONATIONS AND GIFTS

Amendments made to the Local Government Act 1993 and Environmental Planning & Assessment Act 1979 in relation to political donations and gifts will become effective from 1 October 2008.

These introduce obligations on applicants, those making submissions and decision makers in relation to the disclosure of information relating to political donations and gifts during the plan making or development assessment process.

When must an applicant/proponent make a disclosure?

A disclosure must be made by any person who has a financial interest in a planning application and who has made a reportable political donation in the 2 years before a planning application is made and/or determined.

When must a person making a submission make a disclosure?

Any submissions must include disclosure of any reportable political contribution or gift made in the previous two years, and up to the time the application is determined, by you or your associate to anyone including:
(i) all reportable political donation made to any local councillor of the council
(ii) all gifts made to any local councillor or employee of that council.

A reportable political donation made to a local councillor of any local council includes any donation made at the time the person was a candidate for election to the council.

You are advised that a person is guilty of an offence under s125 of the Environmental Planning & Assessment Act 1979 if the person fails to make a disclosure of a reportable political donation or gift if it is reasonable for that person to know such a reportable donation or gift should have been disclosed. It is also an offence to make a false statement. Currently, the maximum penalty is $22,000 or imprisonment for 12 months, or both.

A blank disclosure statement which meets the requirements of the legislation is provided on the backside of this information. If you require any further information as to the definition of terms used, or clarification of your obligations, the Guideline produced by the Department of Planning may be obtained from their web-site – www.planning.nsw.gov.au, or a printed copy obtained from Council's Customer Services Centre.

PO Box 63 (63 Elgin Street) Gunnedah NSW 2380
T +61 2 6740 2100 E council@infogunnedah.com.au
www.gunnedah.nsw.gov.au

Gunnedah Shire Council

Application No: ..... Date Disclosure Made: .....

DISCLOSURE STATEMENT OF POLITICAL DONATIONS AND GIFTS

A disclosure statement of a reportable political donation or gift must accompany a planning application or submission if the reportable donation or gift is made within 2 years before the application or submission is made. If the donation or gift is made after the lodgement of the application, a disclosure statement must be sent to the relevant consent or approval authority within 7 days after the donation or gift is made.

Name of the person making donation or gift: .....

Residential address or Registered/official office: .....

ABN if not an individual: .....

Name/address of development application or planning matter: .....

.....

Date application lodged: .....

Consent or approval authority: **Gunnedah Shire Council**

Person's interest in application: .....

Applicant: .....

Person with *financial interest (explain):* .....

Person making submission in opposition: .....

Person making submission in support: .....

Name of the person to benefit from the donation	**Date donation made**	**Amount of the donation***
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....

Name of the person to whom gift is made	**Date gift made**	**Amount or value of the gift***
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....

*Note: *A reportable political donation of:*

- $1,000 or more made to or for the benefit of the party, elected member, group or candidate; or
- $1,000 or more made by a major political donor to or for the benefit of a party, elected member, group or candidate; or
- Less than $1,000 if the aggregated total of the donation made by the entity or person to the same party, elected member, group, candidate or person within the same financial year (ending 30 June) is $1,000 or more.

Planning Proposal Submission Form

Planning Proposal case number:
PP-2022-383

Applicant details

Title	Mr
First given name	Jarad
Other given name/s	
Family name	Ewing
Contact number	[redacted]
Email	[redacted]
Address	[redacted]
Is the applicant a company?	No

Subject Land

What land does the planning proposal apply to?	Individual properties (five or less lots) within the LGA
Which LGA does the proposal relate to?	GUNNEDAH

Type of Planning Proposal

What controls does the planning proposal relate to ?	The planning proposal relates to map based planning provisions

Select the site of the development

Site address #	1
Street address	210 BUSHS LANE GUNNEDAH 2380
Local government area	GUNNEDAH
Lot / Section Number / Plan	28 / - / DP755474 27 / - / DP755474
Primary address?	Yes
Planning controls affecting property	Land Application LEP Land Zoning Height of Building Floor Space Ratio (n:1) Minimum Lot Size Heritage Land Reservation Acquisition Foreshore Building Line Land near Electrical Infrastructure

Planning Proposal - subject provisions

Which planning provisions does the planning proposal seek to amend? (select all that apply)	Land use zone Minimum lot size
Please provide a brief description of the effect of the planning proposal	To amend the Gunnedah Local Environmental Plan, 2012 to enable the redevelopment of Lots 27 & 28 in DP755474, for R5 Large Lot Residential holdings with a minimum lot size of 9000m².

Prelodgement meeting

Has a pre-lodgement meeting occurred?	Yes
Meeting Date	2/02/2022
Planning Officer	Ashleigh Nixon, Blake O'Mullane

Voluntary Planning Agreement

Is the application accompanied by a voluntary planning agreement (VPA)?	No

Pecuniary interest

Is the applicant or owner an employee or councillor of the council assessing the application?	No
Does the applicant or owner have a relationship with any staff or council or of the Councillor assessing the application?	No

Political Donations

Are you aware of any person who has financial interest in the application who has made a political donation or gift in the last two years?	No

Payer details

First name	Jarad
Other given name/s	
Family name	Ewing
Contact number	[redacted]
Email	[redacted]
Billing address	[redacted]

Application documents

The following documents support the application

Document type	Document file name
Draft Planning Proposal	5448_Planning Proposal Maps 5448_Planning Proposal Report
Other	5448_Gateway Application Ltr to GST
Owner's consent	20220202 Planning Proposal Signed Application

Declarations

I declare that all the information in my application and accompanying documents is, to the best of my knowledge, true and correct.	Yes
I understand that the application and the accompanying information will be provided to the appropriate consent authority and relevant agency(ies) for the purposes of the assessment of this application.	Yes

I understand that if incomplete, the consent authority may request more information, which will result in delays to the application.	Yes
The Planning Proposal authority may use the information and materials provided for notification, advertising purposes, and may be made available to the public for inspection. Information related to the application may also become available via NSW Planning Portal.	Yes
I acknowledge that copies of this application and supporting documentation may be provided to interested persons in accordance with the Government Information (Public Access) 2009 (NSW) (GIPA Act) under which it may be required to release information which you provide to it.	Yes
I have read and agree to the collection and use of my personal information as outlined in the	Yes

GATEWAY APPLICATION

PLANNING PROPOSAL

PROPOSED REZONING LOTS 27 & 28 IN DP755474 210 BUSHS LANE, GUNNEDAH

FROM RU4 TO R5 LARGE LOT RESIDENTIAL WITH A MINIMUM LOT SIZE OF 9,000 SQUARE METRES

REVISION: 5

DATE: 12 SEPTEMBER 2023

PREPARED FOR:

JARAD & PIP EWING

PREPARED BY:
Stewart Surveys Pty Ltd
107-109 Conadilly Street,
PO Box 592
GUNNEDAH NSW 2380
office@stewartsurveys.com

Stewart Surveys Reference 5448

REPORT PREPARATION

Name: **Kathryn Yigman**

Qualifications: Bachelor of Landscape Architecture (UNSW)
Masters of Environmental Management (UNSW)
Registered Landscape Architect (#001493)

Company: **Stewart Surveys Pty Ltd**
ABN: 65 002 886 508
PO Box 592, Gunnedah NSW 2380
(02) 6742 2966
office@stewartsurveys.com

This Gateway Application Planning Proposal has been prepared by our office to accompany a council application. To the best of our knowledge, the content of this statement is true in all material particulars and does not, by its presentation or omission of information, materially mislead.

SITE PARTICULARS

Lot Particulars: **Lots 27 & 28 in DP755474**

Address: **210 Bushs Lane, Gunnedah**

Local Government Area: **Gunnedah**

Land Owners: **Jared Ewing**
Pip Ewing

Date: **Revision 5: 12 September 2023**

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INTRODUCTION

This Gateway Application has been prepared for the applicant Mr Jarad Ewing and Mrs Pip Ewing by Stewart Surveys Pty Ltd.

The land to which this application applies is Lot 27 & 28 in DP755474, located at 210 Bushs Lane, Gunnedah on the corner of Bushs Lane and Robert Gordon Road. The subject site is located within the zone RU4 Primary Production Small Lots with a minimum lot size of 10 hectares under the Gunnedah Local Environment Plan, 2012 (hereby referred to as GLEP, 2012). The land also comes under the provisions of the Gunnedah Development Control Plan 2012 (referred to as the DCP). Planning proposals are prepared under section 3.4 of the Environmental Planning and Assessment Act 1979.

The subject site is vacant land currently utilised for agricultural pursuits of cattle grazing and fodder crops. Improvements on the site include a steel set of cattle yards and rural fencing. Aerial and site photographs in this report illustrate the existing character of the subject site.

This gateway application has been prepared in accordance with the document *Local Environmental Plan Making Guideline,* published by the NSW Department of Planning, Industry and Environment in December 2021 hereby referred to as the guideline.

In accordance with section 3.33 (2) of the Environmental Planning and Assessment Act, 1979 and the guideline this application is presented in the following format:

Part 1 – Objective or intended outcome
Part 2 – Explanation of the provisions
Part 3 – Justification of strategic and site-specific merit
Part 4 – Maps
Part 5 – Community Consultation
Part 6 – Project Timeline

SUBJECT SITE PARTICULARS

The subject site is regular in shape with Lot 27 having a total area of 30.35 hectares and Lot 28 having an area of 30.15 hectares. This provides a total site area of 60.5 hectares. The site is rectangular in shape with 753.5 metres frontage to Bushs Lane and 810 metres frontage to Robert Gordon Road. The property can be described as a small rural holding, with an intermittent gully traversing the centre of the site. There is some low quality native vegetation along this gully and planted trees in the western section. The watercourse feeds into the Blackjack Creek catchment east of the subject site. Bushs Lane is of gravel formation with one residence across the site frontage. Robert Gordon Road is of bitumen construction with a number of rural residential holdings across the site's frontage. A large box culvert has been constructed under Robert Gordon Road in the watercourse alignment. At the time of writing this report the property was planted with an oat crop.

The subject site, Lots 27 and 28 in DP755474, are original holdings created on the 13th May 1900. **Figure 1** and **Figure 2** are extracts from these portion plans showing the holdings. The site was originally described as *"low stony spur, red soil with dense box, pine, wilga and little wattle, yarren and hopbush scrub"*

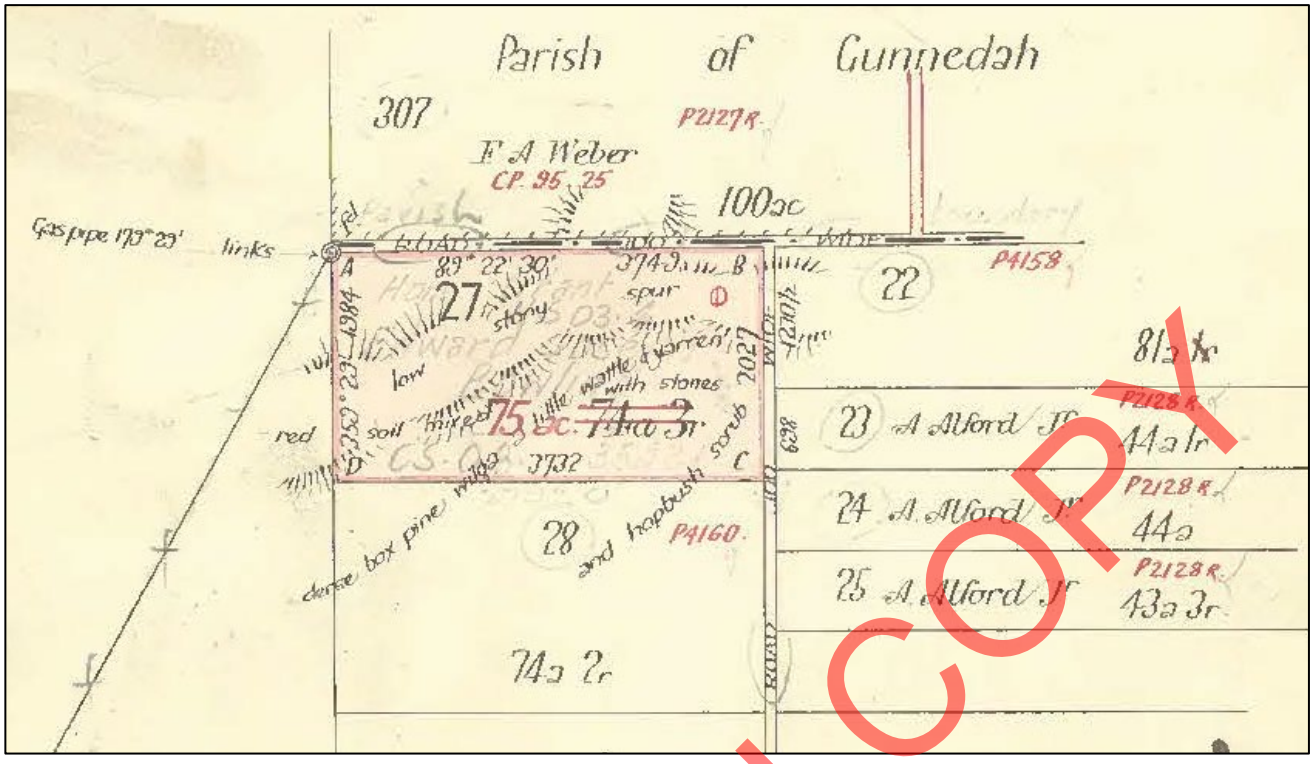

Figure 1: Portion Plan Lot 27

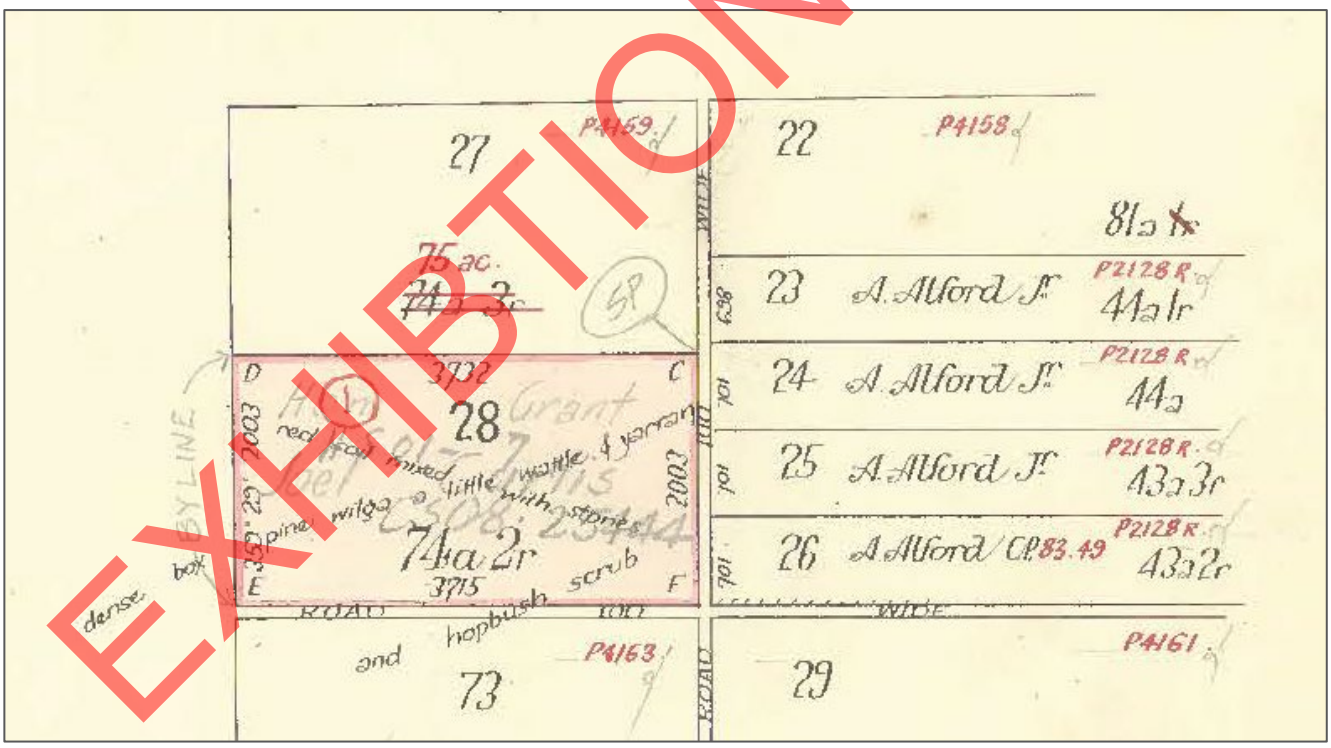

Figure 2: Portion Plan Lot 28

Figure 3: Overview of 210 Bushs Lane, Gunnedah

Figure 4: Site Photo looking south west across the site

Figure 5: Site Photo looking north along the eastern boundary at Robert Gordon Road

Figure 6: Photo from the Eastern Boundary looking from Watercourse towards Bushs Lane

Figure 7: View west along watercourse from eastern boundary

This gateway applies to the following lots:

Lot No.	DP	Zoning	Minimum Lot Size
27	755474	RU4	10ha
28	755474	RU4	10ha

Figure 8 illustrates the current zoning of the subject site as illustrated in the Gunnedah Local Environment Plan 2012 Map LZN-005A. **Figure 9** illustrates the current lot size for the subject site as illustrated in the GLEP, 2012 Map LSZ-005A. Full scale map appended to this report.

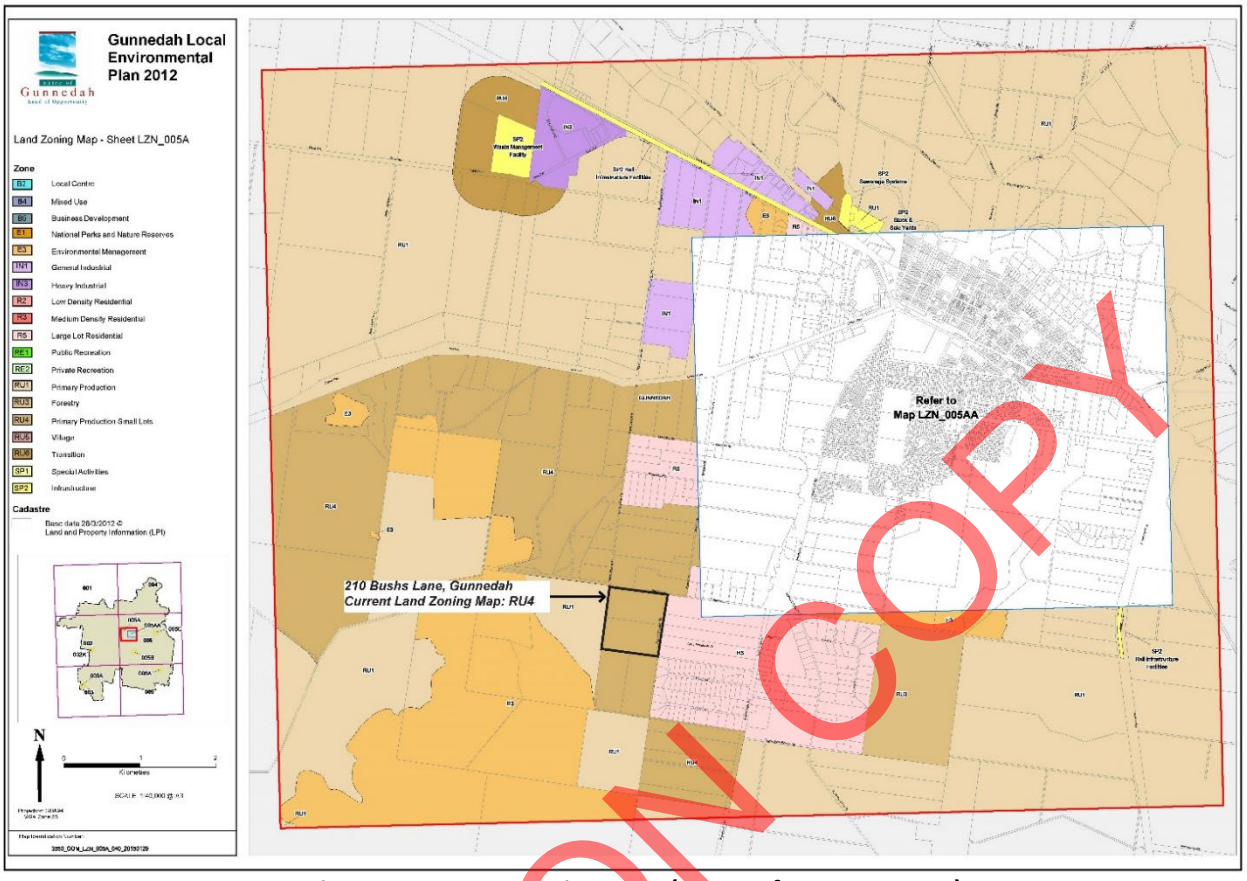

Figure 8: Current Zoning Map (extract from LZN-005A)

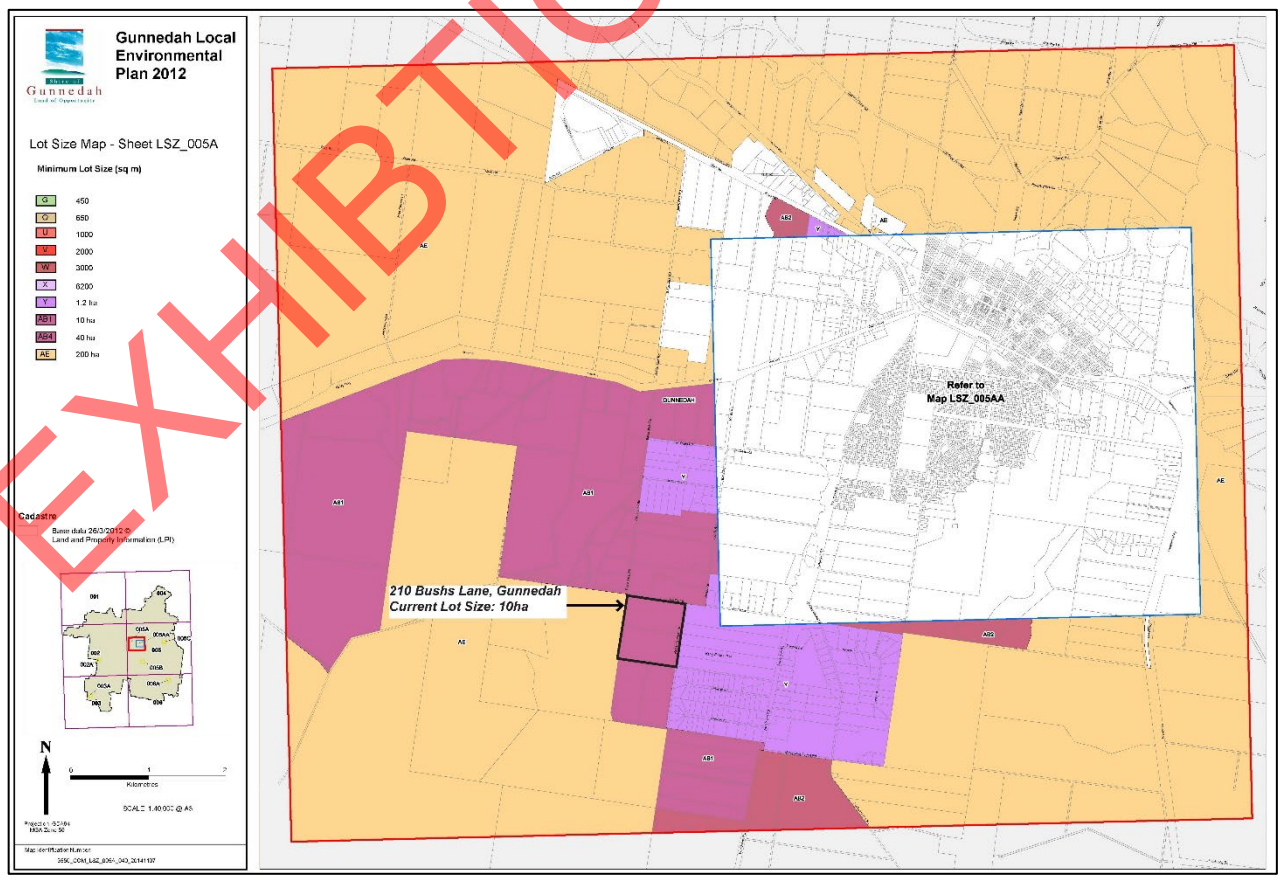

Figure 9: Current Lot Size Map (extract from LSZ_005A)

PART ONE – OBJECTIVES AND INTENDED OUTCOMES

Objective
To amend the Gunnedah Local Environmental Plan, 2012 to enable the redevelopment of Lots 27 and 28 in DP755474, for Large Lot Residential holdings with a minimum lot size of 9,000 square metres.

Intended Outcomes

- Provide additional rural residential housing in close proximity to the town of Gunnedah
- Contribute to the residential community by supporting public services and extending services to the development.
- To align with the recommendations of the Gunnedah Shire Local Housing Strategy, Open for Growth and Prosperity, adopted 21 June 2023, prepared by Elton Consulting

PART TWO – EXPLANATION OF PROVISIONS

The proposed outcome will be achieved by:

- Amending the Gunnedah Local Environmental Plan, 2012 Land Zoning Map LZN-005A on Lots 27 and 28 in DP755474, being 210 Bushs Lane, Gunnedah to R5 Large Lot Residential in accordance with the proposed zoning map shown in **Figure 10;** and
- Amending the Lot Size Map LSZ – 005A on Lots 27 and 28 in DP755474, being 210 Bushes Lane, Gunnedah to "Z" 9000 square metres, which is a new Lot Size for the GLEP, in accordance with the proposed lot size map shown in **Figure 11.**

Proposed zoning

Lot No.	DP	Proposed Zoning
27	755474	R5 – Large Lot Residential
28	755474	R5 – Large Lot Residential

Proposed Minimum Lot Size

Lot No.	DP	Proposed Minimum Lot Size
27	755474	9000m²
28	755474	9000m²

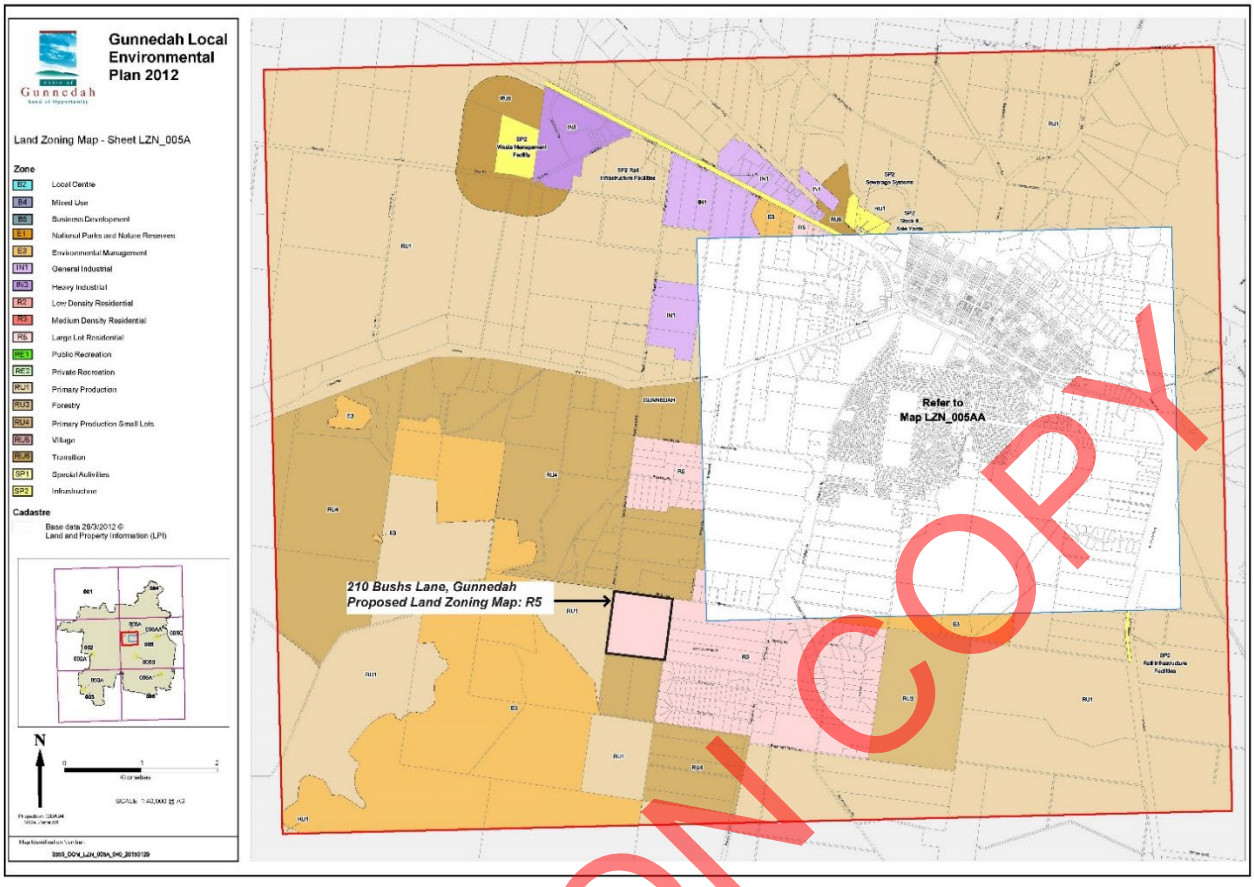

Figure 10: Proposed Land Zoning amendment to Map LZN-005A.

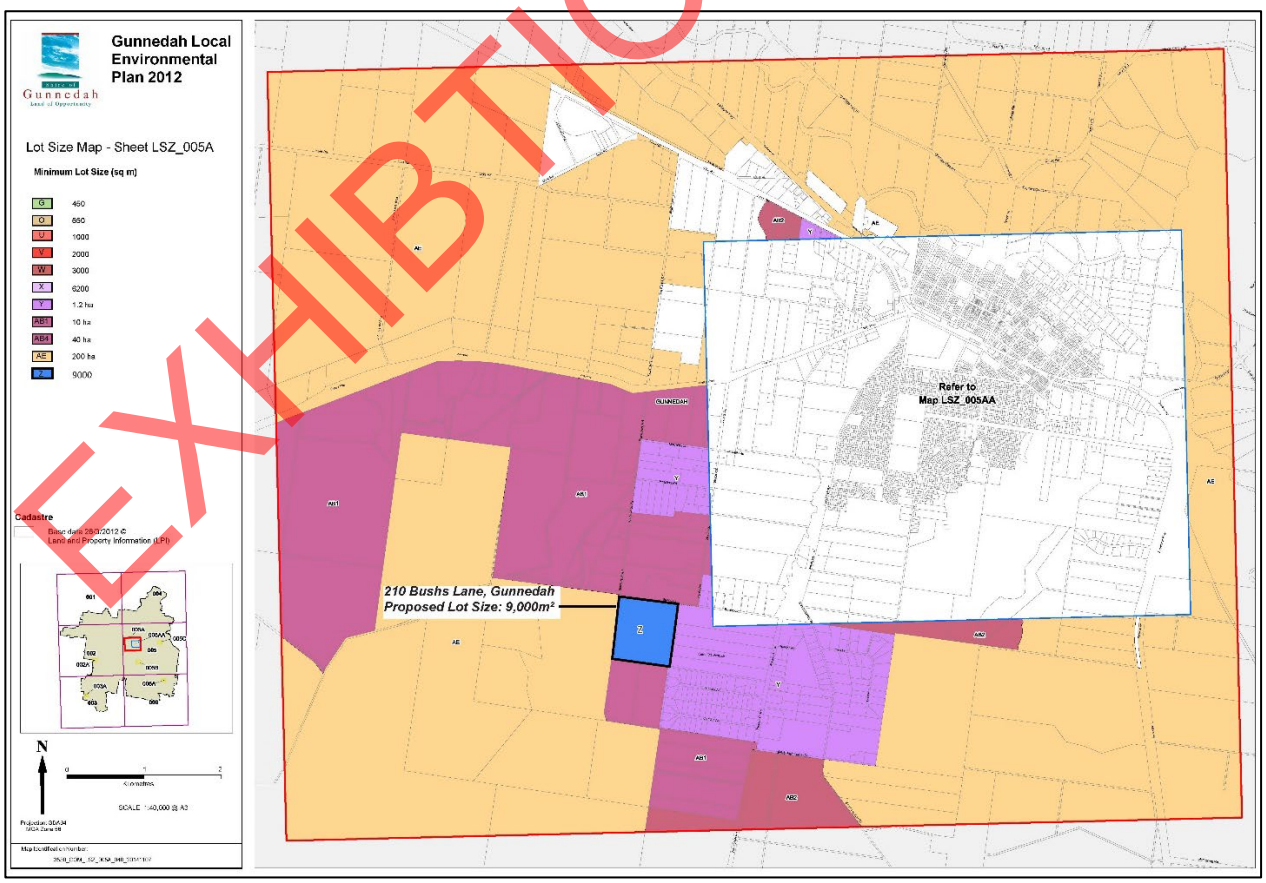

Figure 11: Proposed Lot Size Map Amendment to LSZ_005A

PART THREE – JUSTIFICATION OF STRATEGIC AND SITE SPECIFIC MERIT

The subject site is located in a current area of large lot residential development with adjoining land along Bushs Lane, Robert Gordon Road and Kerry Elizabeth Drive all containing large lot residential holdings with lot sizes varying from 7,922 square metres to 4.4 hectares. Demand for rural residential holdings in Gunnedah has been high and available lots of this size currently on the residential market are very low. The subject site is an ideal extension of the existing landuse pattern in the area of south Gunnedah.

This area of Gunnedah has been identified in Landuse Planning strategies since 1981 as a residential release area. Although the subject site is not included in this plan, it adjoins the release area. The current land use strategy to guide the future residential development of Gunnedah is the Gunnedah Urban Landuse Strategy Volume 4, dated June 2016, prepared by Insite. The subject site is adjacent to the residential release areas identified in this report. **Figure 12** is an extracted diagram showing the site.

The site was not included in the 2016 recommendations as the site could not be serviced by reticulated water due to its elevation. Upgrades to the water main and subsequent servicing strategies for South Gunnedah carried out in circa 2020 have confirmed that the installation of the Gunnedah to Curlewis pipeline has increased capacity for water servicing and Gunnedah Shire Council has confirmed that the subject site can now be provided with reticulated water and therefore can be supported for rezoning to rural residential.

The 2016 Landuse Strategy has been replaced with the Gunnedah Shire Local Housing Strategy, Adopted 21 June 2023, prepared by Elton Consulting. The report recommends the site as an opportunity to be rezoned to R5 Residential zoning. It is also noted that council should consider reducing the minimum lot size for this property to less than one hectare. **Figure 13** show an extract from this report.

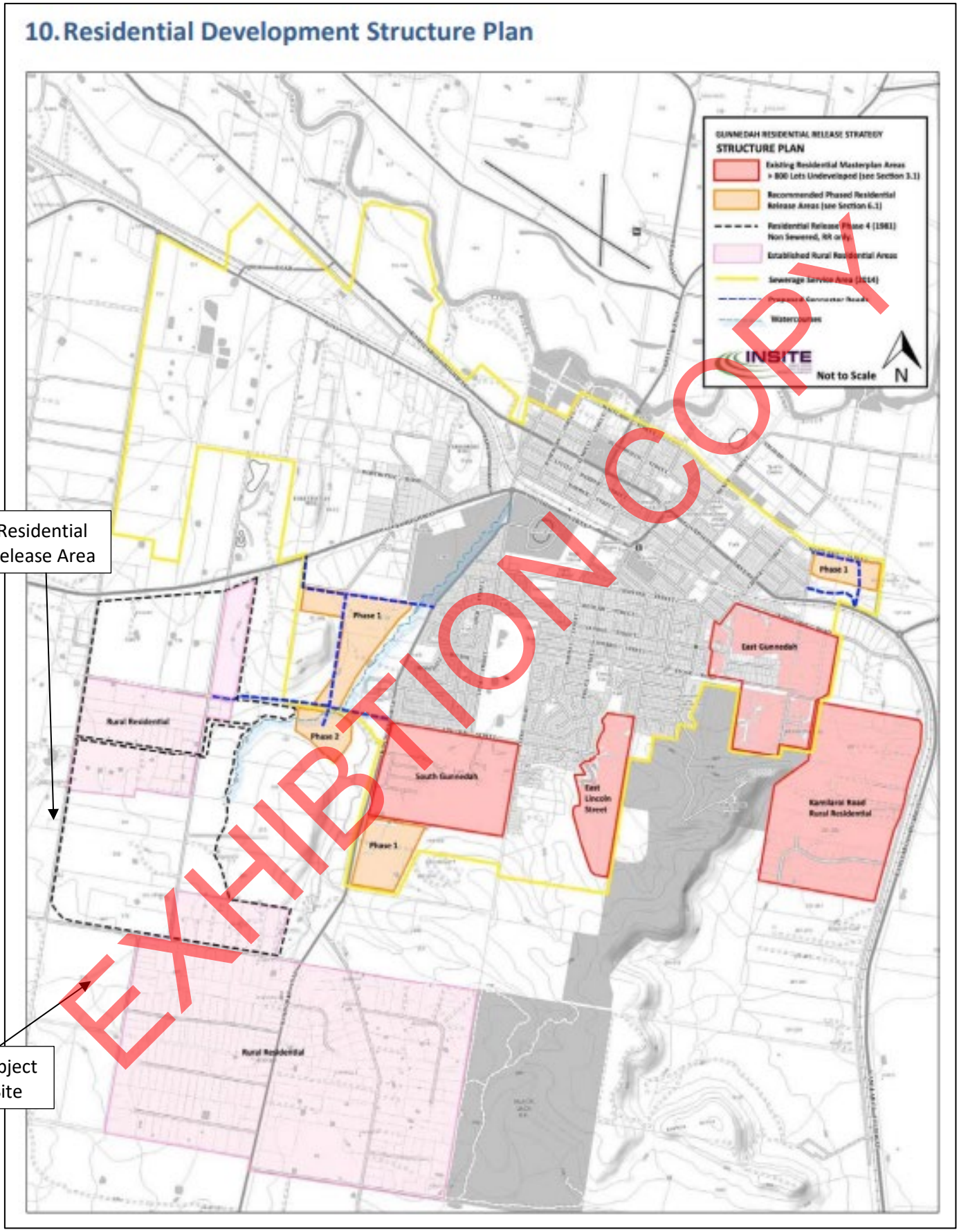

Figure 12: Residential Development Structure Plan (Insight - Gunnedah Urban Landuse Strategy, Vol. 4, June 2016)

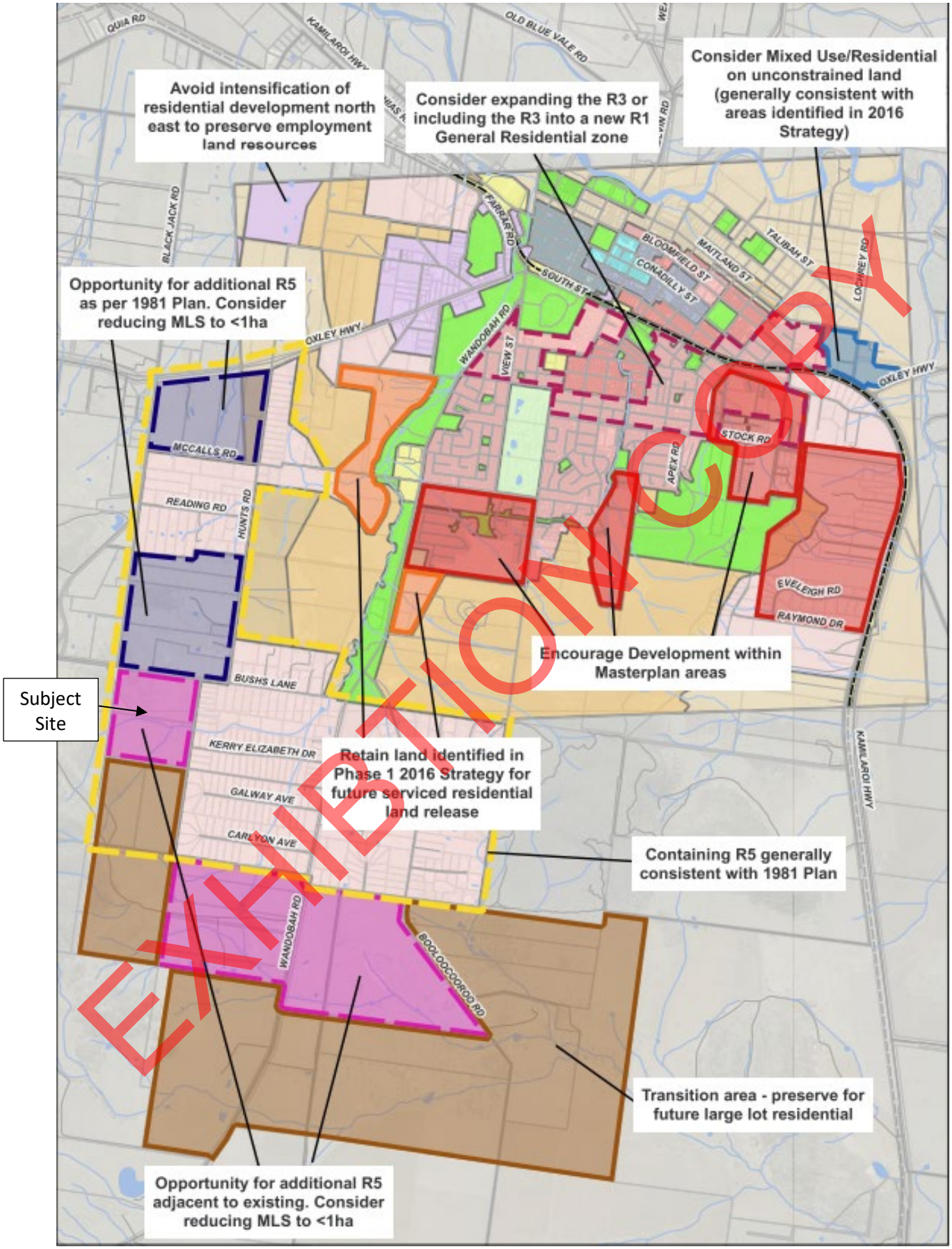

Figure 13: Recommendations for new residential Development 2023 Local Housing Landuse Strategy

A review of the current and historical land use planning for Gunnedah shows that this area of Gunnedah has been earmarked for large lot residential development since 1981. It is therefore consistent with the planned and logical expansion of Gunnedah's Residential area and has strategic merit. It also recommends a reduced minimum lot size less than 1 hectare. This is in recognition that development on land with a lot size greater than 1 hectare has increased reporting and infrastructure requirements, including triggering the State Environmental Planning Policy (Koala Habitat Protection) 2021 (SEPP) and a requirement under the Rural Fires Act for water storage of 20,000 litres dedicated to bushfire protection. Lots less than 1 hectare do not trigger the SEPP and only require 10,000 litres of water dedicated to bushfire protection.

Gunnedah Local Environmental Study Bridging Report 2010 & Gunnedah Shire Rural Lands Strategy 2007
These two strategic reports were prepared prior to the rezoning of land in the Gunnedah Local Environmental Plan, 2012. The reports were prepared to guide the rezoning and to aid council to make strategic decisions to promote community and economic growth and facilitate development whilst implementing sound environmental management principals. The bridging report brings together the findings and objectives of a number of past strategies including the Rural Lands Strategy, identified that Gunnedah was in decline, circa 2003, and new residential lot demand was two (2) per year with available supply in 2010 of 175 lots.

As there was low demand for residential lots at the time, the bridging document recommended that no further rural residential land should be release on the fringes, noting there was sufficient supply of residential land to cater for demand. The report further notes the once "future urban" land is taken up rezoning is supported.

The bridging study identified a number of small rural holdings which were not viable or productive due to their size. It recommended that productive rural holdings have an area of 200 hectares and intensive rural uses had an area of 10 hectares. For rural residential land, zoned 1 (c) at the time of the report, now zoned R5 Large Lot Residential, a minimum lot size of 0.6 hectares with an average lot size of 1.2 hectares across a development was recommended.

The subject site was identified in the rural small lot zone with a minimum lot size of 10 hectares. This recommendation was actioned in the Gunnedah Local Environmental Plan, 2012. The holding has an area of 60.5 hectares and cold be capable of running 6-10 head of cattle as an agricultural pursuit. The property is not capable of sustaining employment on its own. There has been a shift in demand for rural residential land in Gunnedah and the land identified as "Future Urban" in the 2010 bridging report has been taken up. Therefore, rezoning of land on the fringe of the Gunnedah urban development is consistent with Gunnedah Local Environmental Study Bridging report and given the size of the land we do not believe it is viable for agricultural pursuits due to its size and location.

The strategy outlines to "provide for sustainable rural living whilst recognising economic, social, environmental, rural matters and purposes. The bridging document suggests the following actions: Provide for new rural residential development where appropriate services can be provided and impacts can be minimised. We have reviewed the Gunnedah Local Environmental Study Bridging Report 2010 and Gunnedah Shire Rural Lands Strategy 2007 and believe the proposed rezoning is consistent with these reports.

Gunnedah Local Environmental Plan, 2012 R5 Large Lot Residential Zone
The objectives of the R5 Large Lot Residential zone under the GLEP, 2012 are:

- To provide residential housing in a rural setting while preserving, and minimising impacts on, environmentally sensitive locations and scenic quality.
- To ensure that large residential lots do not hinder the proper and orderly development of urban areas in the future.
- To ensure that development in the area does not unreasonably increase the demand for public services or public facilities.
- To minimise conflict between land uses within this zone and land uses within adjoining zones.
- To provide a restricted range of opportunities for employment, development and community facilities and services that do not unreasonably or significantly detract from—
  (a) the primary residential function, character and amenity of the neighbourhood, and
  (b) the quality of the natural and built environments.

We have provided an explanation on how the proposed development will meet the objectives of the R5 zone below.

To provide residential housing in a rural setting while preserving, and minimising impacts on, environmentally sensitive locations and scenic quality.
Initial review and searches of the subject site area have not identified any environmentally sensitive areas on the subject site. The site is located on the foot slopes of Blackjack Mountain with the elevation on the western boundary approximately 40 metres below the commencement of steep terrain and heavily vegetated landscape. Blackjack Mountain provides scenic value to the area with views uncompromised by the subject site. We don't believe the site itself has high scenic quality with visibility being restricted to Bushs Lane, Robert Gordon Road and the adjoining properties. Therefore, we believe the proposed rezoning of this property will provide additional residential housing in a rural setting with minimal impact on environmentally sensitive locations and scenic quality.

To ensure that large residential lots do not hinder the proper and orderly development of urban areas in the future.
The proposed development site is located adjacent to the existing R5 zone along Robert Gordon Road, Kerry Elizabeth Drive and Bushs Lane. As the subject site has two road frontages, it allows for development along these existing frontages in an orderly extension of the existing R5 zone. A new looped road is proposed to provide access to lots within the holding. The development is consistent with Gunnedah's residential land use strategic planning.

To ensure that development in the area does not unreasonably increase the demand for public services or public facilities.
The subject site is located in a reticulated water supply area with a main along Robert Gordon Road servicing the adjoining properties. The main terminates at the intersection of Robert Gordon Road and Bushs lane. The developer will extend this service within the proposed road reserve and along Bushs Lane to service his development. **Figure 14** shows the existing water infrastructure across the site frontage.

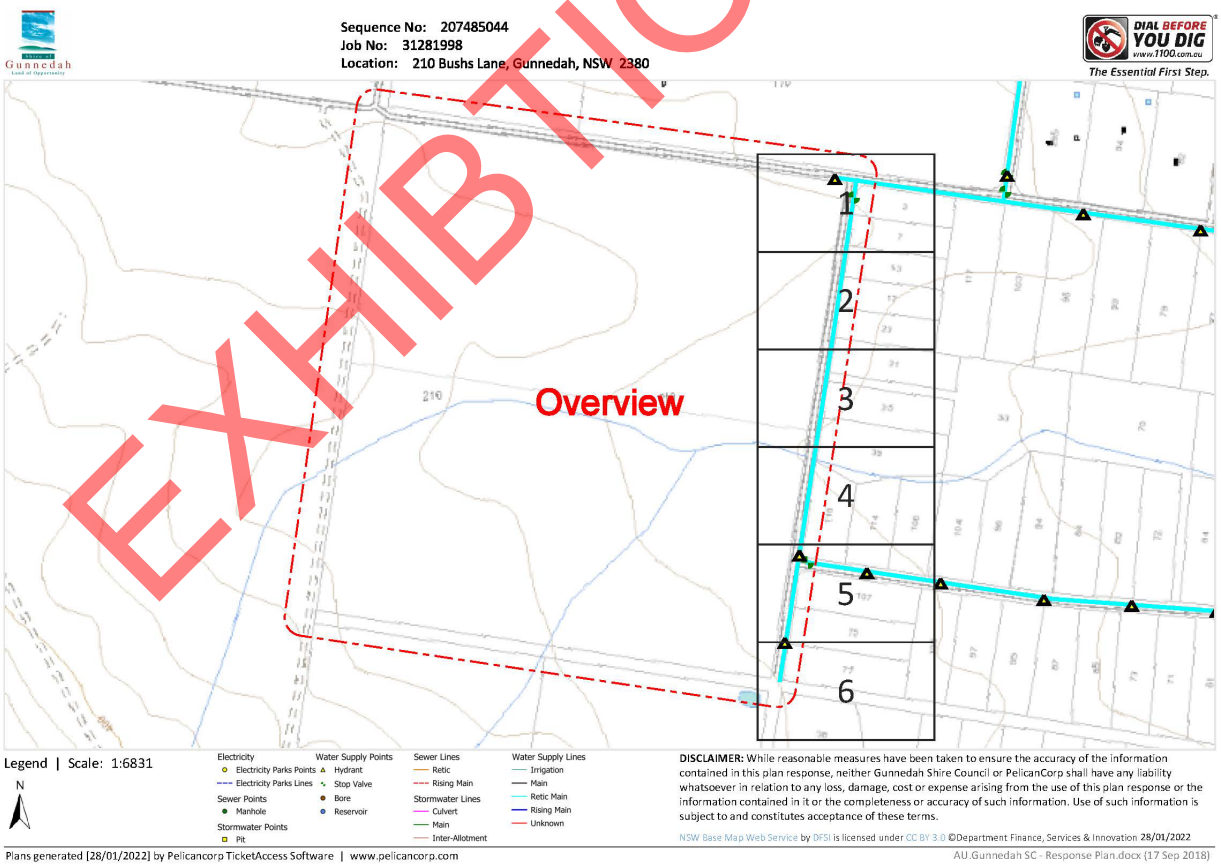

Figure 14: Dial Before you Dig Search (Gunnedah Shire Council)

There are upgrade requirements to the Links Road water reservoir to enable adequate water delivery to this development. The proponent (2728 Pty Ltd) has entered a Voluntary Planning Agreement (VPA) with Gunnedah Shire Council. This document is titled:

Deed 170 and 210 Bush's Lane Planning Agreement Planning Agreement under s7.4 of the Environmental Planning and Assessment Act 1979, Gunnedah Shire Council, 2728 Pty Ltd, Ryan Peter Pryde and Nancy Fay Margaret Williams Date: 10 August 2023

In essence this VPA outlines that the developer will pay upfront for the required upgrades to the Links Road Reservoir and council will discount the headworks contributions for water to the same monetary value for the development. This VPA will guarantee the land can be serviced by Council's reticulated water supply.

The subject site is not located in a reticulated sewer area and the Gunnedah DCP requires onsite sewerage management systems to be installed at the time of house construction.

The proposed rezoning of this property and subsequent development consent for the subdivision will condition the developer to extend the water services to each new lot at no cost to the public. The upgrade of this section of road by the developer would improve public facilities in this area and meet the increased demand on the road and expectations of surrounding residences.

We believe, based on our past consultation with Gunnedah Shire Council's Infrastructure and Development team, that the proposed development can be serviced by infrastructure upgrades nominated in the VPA and with localised service extensions required under the DCP at no unreasonable cost to the public. The increased demand on infrastructure will be offset by the developer headworks contributions paid at the time of subdivision.

The public road network surrounding the site includes bitumen seal to Robert Gordon Road for the full extent of the development and gravel formation to Bushs Lane extending from the intersection of Robert Gordon Road to the western boundary of the site. A subsequent development application and consent will require the developer to provide a bitumen sealed road in accordance with Gunnedah Shire Council's engineering and subdivision guidelines to the gravel section of Bushs Lane resulting in bitumen sealed road frontage across this property.

To minimise conflict between land uses within this zone and land uses within adjoining zones.
The subject site is currently zoned RU4 Primary Production Small Lots with a minimum lot size of 10 hectares. The land adjoining the subject site is currently zoned R5 Large Lot Residential and RU4 Primary Production Small Lots. Currently there are a number of areas in Gunnedah where the R5 and RU4 zones join with no land use conflicts, therefore, we don't expect the rezoning to result in any land use conflicts on the surrounding RU4 zoned land.

To provide a restricted range of opportunities for employment, development and community facilities and services that do not unreasonably or significantly detract from—
(a) the primary residential function, character and amenity of the neighbourhood, and
(b) the quality of the natural and built environments
The proposed development will enable future development aligned with the R5 permitted uses in accordance with this objective.

We have reviewed this planning proposal against the objectives of the R5 Large Lot Residential zone of the Gunnedah Local Environmental Plan, 2012 and we believe this development is consistent with the objectives of the zone.

Minimum Lot size Site Specific Merits
As outlined in this report the current minimum lot size for R5 Large Lot residential areas in Gunnedah is 2,000 square metres, 3000 square metres or 1.2 hectares. The R5 zone outside the town limits, in the vicinity of the subject site is mapped with a minimum lot size of 1.2 hectares under the GLEP, 2012.

In the Gunnedah Local Environment Plan, 1998 the minimum lot size for the equivalent zone was an average of 1.2 hectares across the development. This has resulted in a number of lots less than 1.2 hectares in this area, including 5 lots (Lot 16 to 20 in DP1167105) directly opposite the site on Robert Gordon Road which are between 7,922 square metres and 8,096 square metres as shown in an extract from Deposited Plan 1167105, **Figure 15**. Support of a new minimum lot size of 9,000 square metres is therefore, consistent with the size of other rural residential holdings in the sites vicinity.

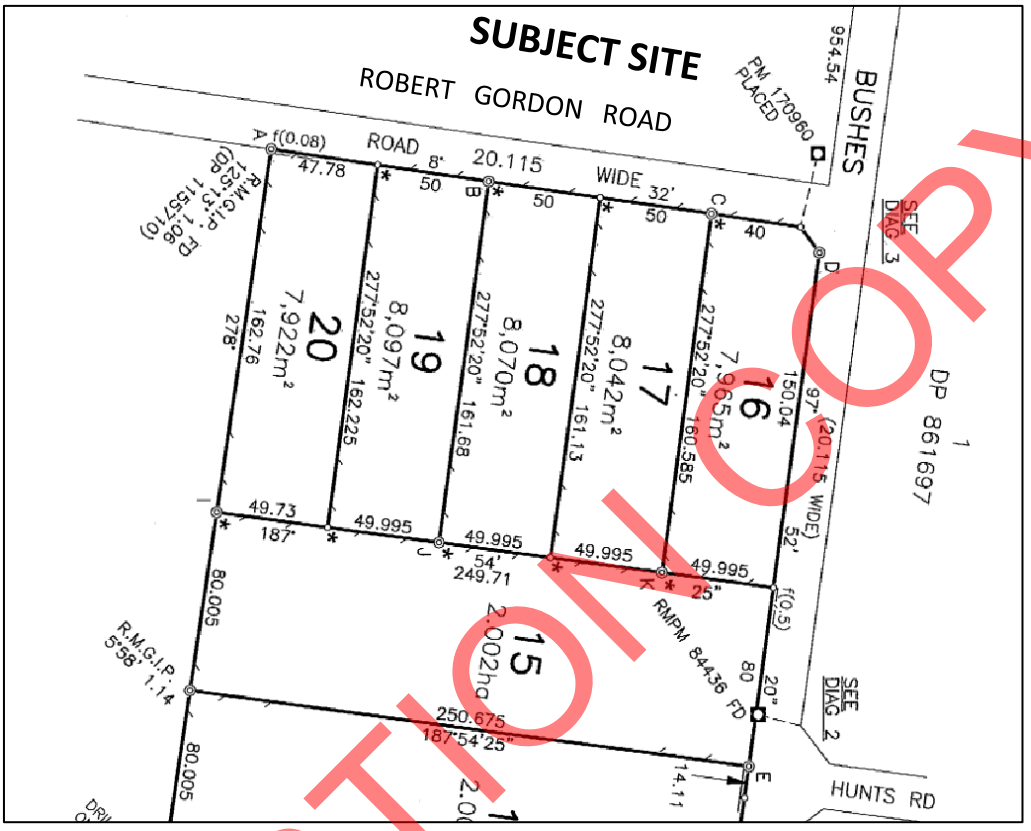

Figure 15: Extract from Deposited Plan 1167105

As outlined above the Gunnedah Shire Local Housing Strategy, adopted 21 June 2023, prepared by Elton Consulting recommends a minimum lot size of less than 1 hectare. This planning proposal is therefore aligned with the current strategic planning direction for Gunnedah. A minimum lot size of 9,000 square metres, resulting in sixty one lots on the subject land is 15 lots more than the 1.2 hectare layout for this site. Therefore, approval of this planning proposal will provide 15 additional residential holdings or 24.5 percent increased lot yield on this development site, when compared to the current minimum lot size in this area, which provides a number of benefits including:

- More efficient use of available land;
- Greater supply of rural residential lots to the market;
- More efficiency in provision of services;
- Increased developer contributions paid to council for community facilities and infrastructure services; and
- Lower development costs per lot, which can result in more affordable housing across the development.

We believe that support of a 9,000 square metre minimum lot size has a lot of strategic merit, is aligned with landuse planning and current land use patterns in the area and within the handling capacity of the environment.

SECTION A – NEED FOR PLANNING PROPOSAL

Section A of the guideline outlines the need for the planning proposal criteria.

This planning proposal aims to give effect to the long term strategic planning for residential development in Gunnedah. There is a shortage of large lot residential land available in Gunnedah with high demand for this sized holding. This planning proposal will allow the potential for 61 additional residential holdings exceeding 9,000 square metres in size, in an area of Gunnedah which has been planned for residential development in strategic planning since 1981.

It is believed that this proposal is the best means for achieving the intended outcome of redevelopment of Lots 27 and 28 in DP755474, for Large Lot Residential holdings with a minimum lot size of 9,000 square metres. The planning proposal is the legal method of amending the Gunnedah Local Environment Plan 2012 to enable development of the subject site.

SECTION B – RELATIONSHIP TO STRATEGIC PLANNING FRAMEWORK

Section B of the guideline requires a review of the proposal to any regional or sub-regional strategies. Gunnedah Shire Council is subject to the regional strategy: *New England North West Regional Plan 2041 (NENW RP, 2041)*. This regional plan sets a 20 year strategic land use planning framework for the region, aiming to protect and enhance the region's assets and plans for a sustainable future.

The vision statement of the strategic plan outlines the rich agricultural base of the region, being one of Australia's most productive agricultural regions, protection of the diverse natural environment, provision of attractive, safe, well connected and prosperous communities and a strong education base.

"*The plan identifies that the region will experience challenges due to climate change, hazards and ageing populations in the next 20 years and the plan aims to respond to these challenges in a constructive and pragmatic way to minimise exposure to hazards, diversify the economy, build community and infrastructure resilience, safeguard water security and plan for a sustainable future.*"

Key parts of the strategy, aligned to deliver the vision, in which this planning proposal helps to deliver are:
Part 1: Growth, change and opportunity.
Objective 1: Coordinate land use planning for future growth, community need and regional economic development.

Part 4: Housing and Place
Objective 13: Provide well located housing options to meet demand.
Objective 14: Provide more affordable and low-cost housing.
Objective 15: Understand, respect, and integrate Aboriginal culture and heritage.

Part 1 Growth Change and Opportunity
Part 1 Growth Change and Opportunity is met by identifying growth needs and opportunities and direct land suitable to accommodate planned growth. As outlined in this report, this area of Gunnedah has been identified for rural residential development in the Gunnedah Shire Local Housing Strategy 2023 and the minimum lot size of less than 1 hectare is a recommendation of this report. The land is suitable for large lot residential development as it avoids key constraints. The land is not flood prone as identified in **Figure 16**. The land is not bushfire prone as identified in **Figure 17.** The site is not part of any important farming areas, areas of high environmental value or steep land. The VPA which has been entered for this development demonstrates adequate water infrastructure and the subject site will cater for onsite sewerage management systems in accordance with the Gunnedah Development Control Plan. The services planning has been reviewed with council to establish the land can be feasibly serviced by entering the VPA for water service upgrades. We believe the development aligns with objective 1 of the NENW RP, 2041.

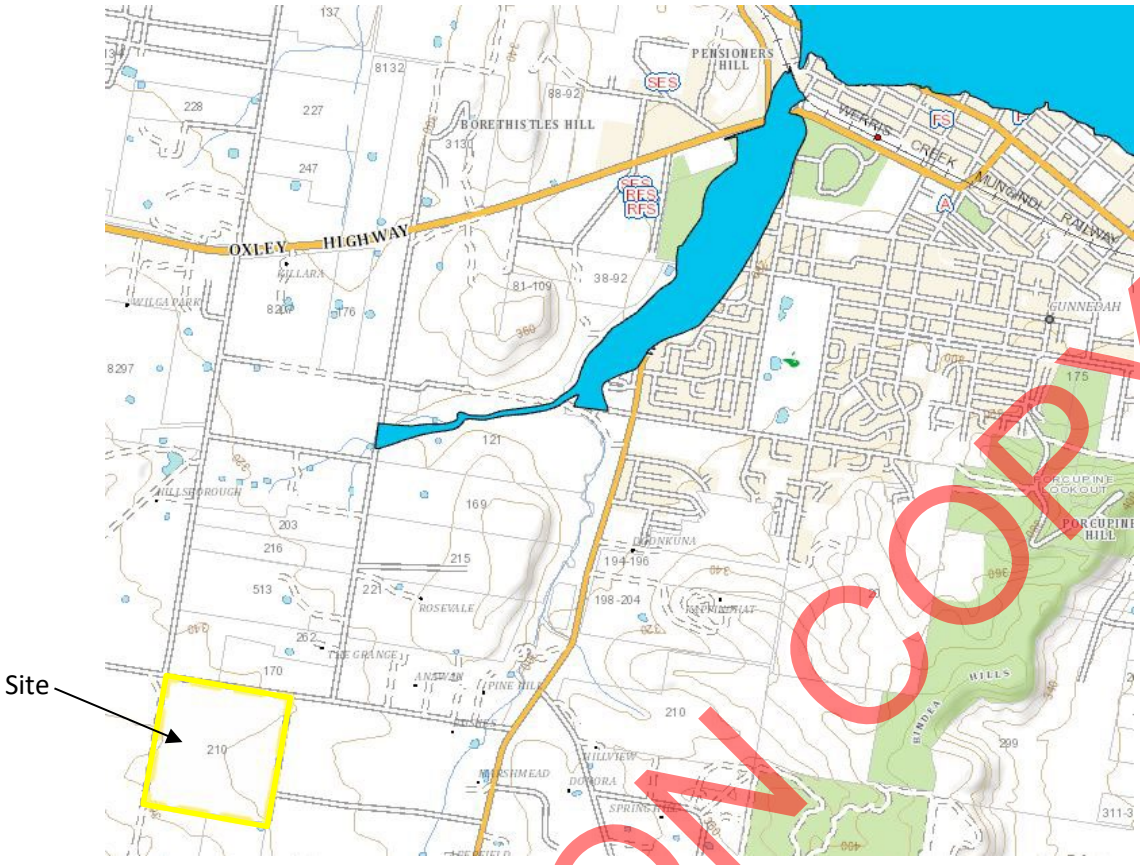

Figure 16: Flood Planning under the Gunnedah Local Environmental Plan, 2012 (Eplanning Portal)

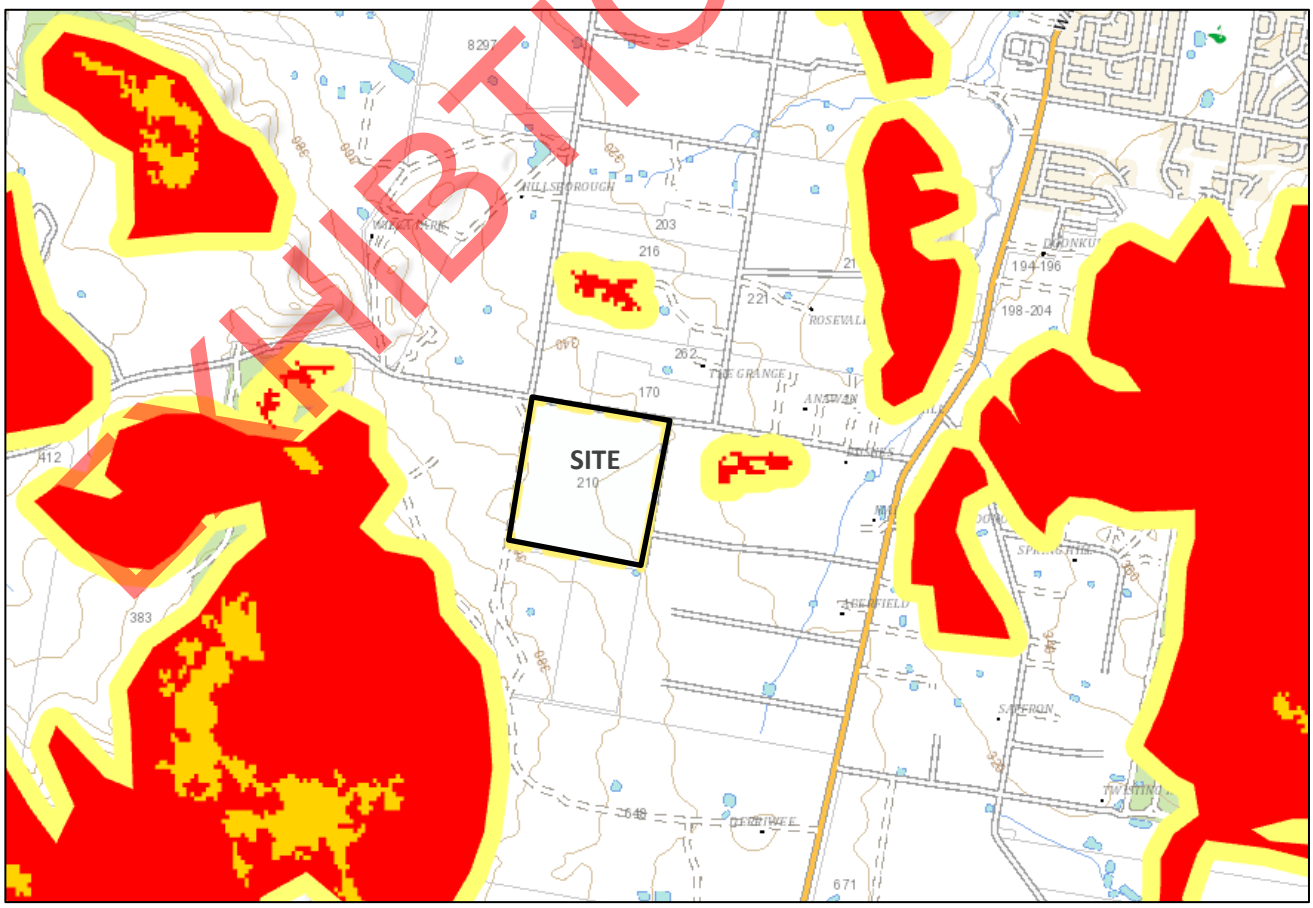

Figure 17: Bushfire Prone Land (Eplanning Portal)

Part 4 Housing and Place

Housing in the large lot residential land size is almost exhausted in Gunnedah with strong demand over the past 5 years for this sized development. The subject site is well-located, adjacent to existing large lot rural residential land, to meet the current housing demand, aligning with objective 13 of the NENW RP, 2041. In the plan strategy 13.3 states that new rural residential housing is to be located on land which has been approved in an existing strategy endorsed by the Department of Planning and Environment. This development is consistent with the Gunnedah Shire Local Housing Strategy Open for Growth and Prosperity, adopted 21 June 2023, resolution 11.6/23 as shown in **Figure 13**.

This development is not directly aligned with the affordable or low cost housing models but it does allow young families or local people, to upgrade and build a new house in this development and their existing property can be returned to the market. This brings diversity in housing product and housing prices. Aiding in increasing supply of affordable housing within the more established residential areas of the town.

An Aboriginal Cultural Heritage report has been prepared for the proposed development by archaeologist Patrick Gaynor. This assessment identified three artefacts of cultural significance adjacent to the watercourse approximately 87 metres west of Robert Gordon Road and a further 62 metres west of the first artefact. These Artefacts are shown in **Figure 18**, and described below:

- Mudstone flake blade shaped 35x17x7mm focal platform notched edge, located on ants next
- Mudstone flake 18 x 17 x 3mm focal platform – later used as a cone, located on ants nest
- Chalcedony flake – focal platform sharp edges 15% cortex from an outcrop, located east end of site

Figure 18: Cultural Heritage artefacts (Gaynor 2021)

The report recommended that these items be fenced off with a 15 metre buffer to protect them from construction. This report shows the development is consistent with objective 15 of the NENW RP 2041. Connection to country and preservation of aboriginal cultural heritage should be built upon through education. The protection of these artefacts on the site will draw local residents' attention to the significance of drainage lines as important places in aboriginal culture through documentation in the sales contracts.

This rezoning proposal is aligned with the vision and objectives of the NENW RP, 2041. The development will provide additional housing in a suitable location to support the growing population in Gunnedah. As this proposal is consistent with the Gunnedah Housing Strategy the rezoning is a systematic delivery of a component recommended in this strategic plan.

The guideline requires a review of relevant State Environmental Planning Policies (SEPP) for compatibility with the planning proposal. We have conducted an E-Planning property report for the site, which is appended to this report. This property report lists the State Environmental Planning Policies which apply to this property and **Table 1** reviews the compliance of the planning proposal with each SEPP.

Table 1: State Environmental Planning Policy (SEPP) application to this planning proposal

State Environmental Planning Policy (SEPP)	Applicable	Consistency	Comment
SEPP (Housing) 2021: Land Application	Yes	Yes	This SEPP is aimed at providing a planning regime for the provision of affordable rental housing. The GLEP, 2012 outlines the permitted land uses in the R5 zone and many of the affordable housing models such as residential flat buildings, boarding houses, secondary dwellings and group homes are prohibited in this zone. The Planning Proposal is not inconsistent with the SEPP.
SEPP Environmental Planning Policy (Building Sustainability Index: BASIX) 2004: Land Application	Yes	Yes	BASIX will apply at the time of residential construction on the subject site.
SEPP (Planning Systems) 2021	Yes	Yes	This planning proposal is not inconsistent with this SEPP.
SEPP (Transport and Infrastructure) 2021	No	N/a	Education Establishments and Childcare facilities are prohibited in the R5 zone of the GLEP, 2012.
SEPP (Exempt and Complying Development Codes) 2008: Land Application	Yes	Compliant	This planning proposal will allow the application of this SEPP to future developments.
SEPP (Transport and Infrastructure) 2021: Land Application	Yes	Compliant	This planning proposal does not impact application of this SEPP to future development.
SEPP (Resources and Energy) 2021	No	N/a	This SEPP relates to mining and petroleum production which is prohibited in the R5 zone. The planning proposal does not inhibit application of this SEPP on other adjoining properties where these activities are permitted.

SEPP (Primary Production) 2021: Land Application	Yes	Compliant	This SEPP is for the orderly and economic use and development of primary production land and gives consent to certain activities. This planning proposal does not impact application of this SEPP.
SEPP (Biodiversity and Conservation) 2021	Yes	Compliant	This SEPP will apply to any future subdivision of this holding. This planning proposal does not impact application of this SEPP.
SEPP (no 65-design Quality of Residential Apartment Development: Land Application.	No	NA	This planning proposal does not apply to residential apartment development.
SEPP (Resilience and Hazards) 2021	Yes	Compliant	A contamination assessment has been carried out for this property and reports a low risk of contamination at the site.

We believe this proposal is compliant with the State Environmental Planning Policies.

We provide the following review of the ministerial directions issued by the Minister of Planning under the Environmental Planning and Assessment Act 1979 section 9.1 (2) for compatibility. The tables below review these directions and their application to this planning proposal.

Focus Area 1: Planning Systems

Direction	Applicable	Consistency	Comment
1.1 Implementation of Regional Plans	Yes	Yes	This direction applies to a relevant planning authority when preparing a planning proposal for land to which a Regional Plan has been released by the Minister of Planning. The planning proposal must be consistent with this regional plan. Gunnedah falls under the New England North West 2036 Regional Plan. As outlined above in this section of the report, the planning proposal is consistent with the intent of the regional plan, the overall vision, goals, directions and actions.
1.2 Development of Aboriginal Land Council	No	N/a	This direction is listed as being applicable to all land identified on the Land Application Map in chapter 3 of the SEPP (Planning Systems) 2021. We have reviewed the Aboriginal Cultural Significance Map on the Planning Portal and no areas are identified in the Gunnedah Shire
1.3 Approval and referral requirements	Yes	Yes	This direction applies to planning proposals and aims to ensure LEP provisions encourage the efficient and appropriate assessment of development. The direction requires consent authorities to minimise the requirement for concurrence, consultation or referral of development applications to a minister or public authority. The referral requirements at development application stage will be determined by the consent authority, which in this case is Gunnedah Shire Council. The proposed development is not designated

			development. We believe the proposed development is consistent with this direction.
1.4 Site Specific provisions	Yes	Yes	This planning proposal applies for the whole rezoning of the land to be consistent with zone R5 Large Lot residential under the GLEP, 2012. It will not apply restrictive site specific planning controls to the land. This direction also requires that a planning proposal must not contain or refer to drawings that show details of the proposed development. We believe this planning proposal is consistent with ministerial direction 1.4.
Focus Area 1 Planning Systems – Place Based	No	N/a	1.5 Parramatta Road Corridor Urban Transformation Strategy 1.6 Implementation of North West Priority Growth Area Land Use and Infrastructure Implementation Plan 1.7 Implementation of Greater Parramatta Priority Growth Area Interim Land Use and Infrastructure Implementation Plan 1.8 Implementation of Wilton Priority Growth Area Interim Land Use and Infrastructure Implementation Plan 1.9 Implementation of Glenfield to Macarthur Urban Renewal Corridor 1.10 Implementation of the Western Sydney Aerotropolis Plan 1.11 Implementation of Bayside West Precincts 2036 Plan 1.12 Implementation of Planning Principles for the Cooks Cove Precinct 1.13 Implementation of St Leonards and Crows Nest 2036 Plan 1.14 Implementation of Greater Macarthur 2040 1.15 Implementation of the Pyrmont Peninsula Place Strategy 1.16 North West Rail Link Corridor Strategy 1.17 Implementation of the Bays West Place Strategy **Directions 1.5 to 1.17 are not applicable to Gunnedah Shire Council.**

Focus Area 2: Design and Place

This focus area was blank when the directions were made.

Focus Area 3: Biodiversity and Conservation

Direction	Applicable	Consistency	Comment
3.1 Conservation Areas	No	N/a	The subject site is not located in an environmentally sensitive area or environmental protection zone and therefore this direction is not applicable to this application
3.2 Heritage Conservation	Yes	Yes	This direction aims to conserve items, areas, objects and places of environmental or indigenous heritage. An aboriginal cultural heritage assessment has been carried out as part of this development to ensure the proposed

			development will not have any impact on items, areas, objects, or places of environmental, cultural or Indigenous heritage and the development is consistent with this direction.
3.3 Sydney Drinking Water Catchment	No	N/a	This direction is not applicable to Gunnedah Shire
3.4 Application of C2 and C3 Zones in Environmental Overlays in Far North Coast LEPS	No	N/a	The subject site is noted Zoned C2 or C3 and therefore this direction is not applicable.
3.5 Recreational Vehicle Areas	No	N/a	The subject site is not located with a conservation area, near a beach or dune area. This planning proposal is to facility rezoning of the land for residential purposes and no recreational vehicle areas are proposed.

Focus Area 4: Resilience and Hazards

Direction	**Applicable**	**Consistency**	**Comment**
4.1 Flooding	No	N/a	The subject site is not mapped as flood prone land as shown in **Figure 16.**
4.2 Coastal Management	No	N/a	The subject site is not on a coastal zone.
4.3 Planning for bushfire protection	No	N/a	The subject site is not mapped as bushfire prone land in the Gunnedah Shire as shown in **Figure 17**.
4.4 Remediation of contaminated land	Yes	Yes	As outlined under *State Environmental Planning Policy (Resilience and Hazards) 2021,* Agricultural activities are listed in table 1 as an activity which may cause contamination. Contamination and the SEPP (formally SEPP 55) has been addressed in section C of this report and it is concluded that as the land has only been used for horse grazing and lifestyle uses and intensive agricultural pursuits have not been carried out at the site. Therefore, there are no known sources or risks of contamination identified on the subject site. Our client has prepared a declaration of land uses at the site and provided declaration that there are no sources of contamination on the subject site we believe this should enable the consent authority to be satisfied the land is not contaminated.
4.5 Acid Sulfate Soils	No	N/a	There are no Acid Sulfate Soils in the Gunnedah Shire
4.6 Mine Subsidence and Unstable Land	No	N/a	The subject site is not located in a mine subsidence area as shown in **Figure 19**

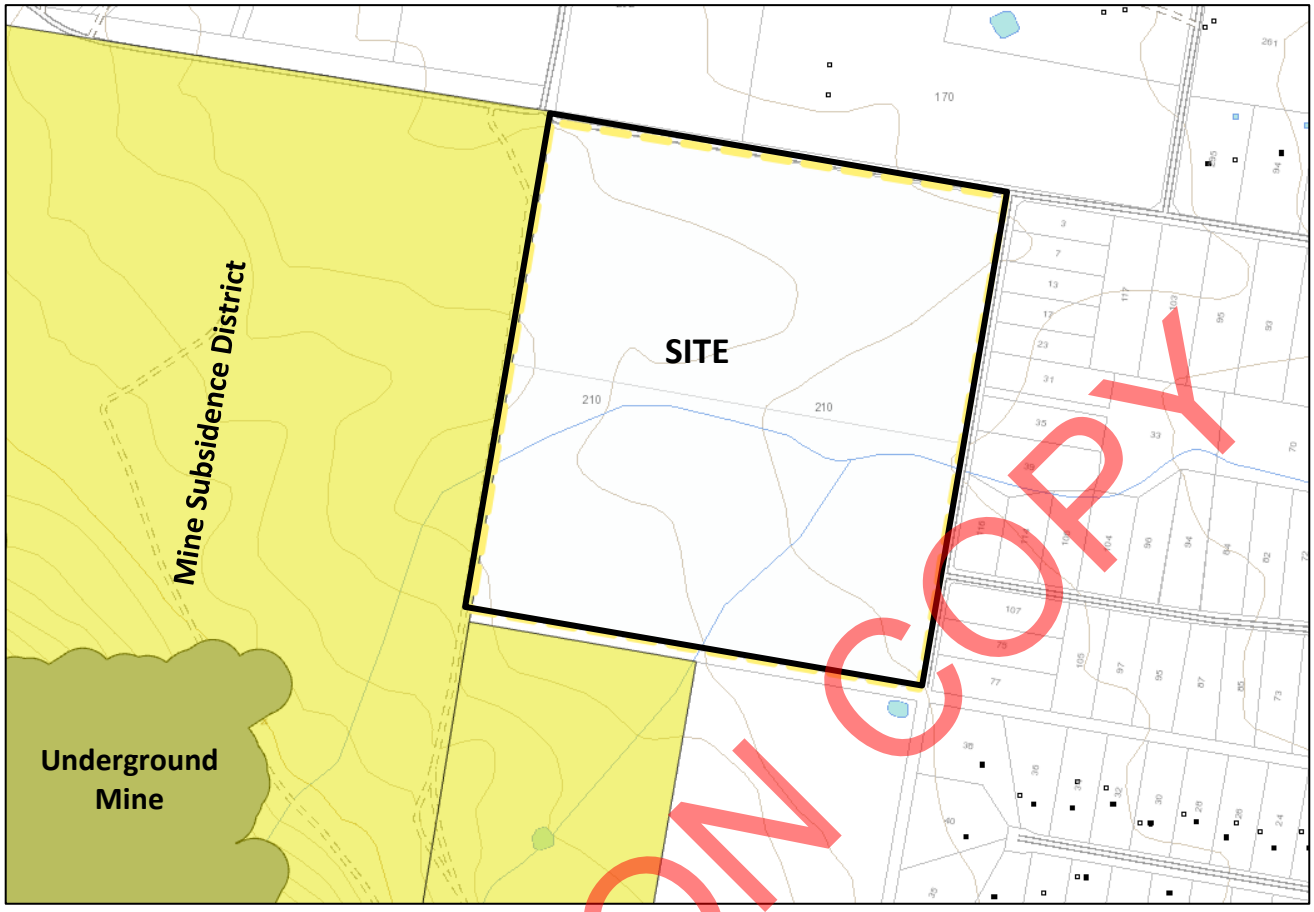

Figure 19: Mine Subsidence District and Underground Mining Area

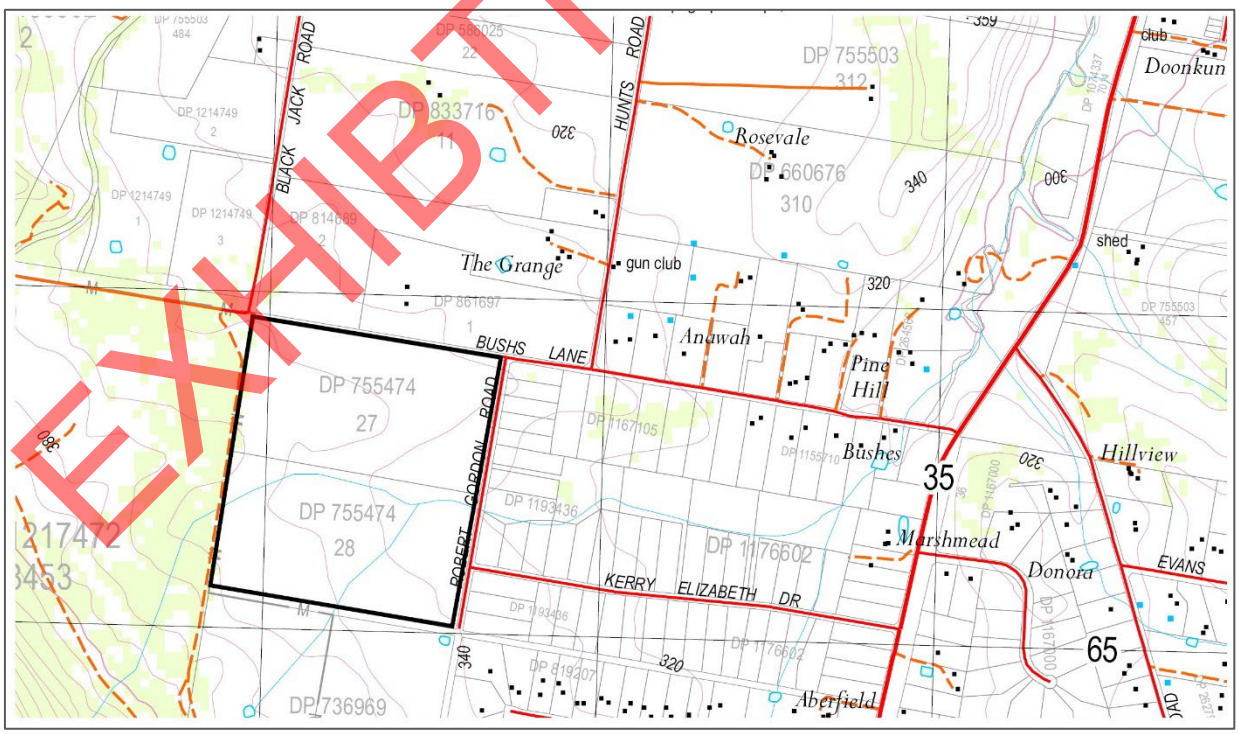

Figure 20: Topographic Map (Source: Wondoba 8935-4N GeoPDF Topographic Map 2017 Edition)

Focus Area 5: Transport and Infrastructure

Direction	Applicable	Consistency	Comment
5.1 Integrated Land Use and Transport	No	N/a	This direction requires all planning proposals which will create, alter or remove a provision relating to urban land including land Zoned for residential uses. The direction requires a statement of consistency to the aims, objectives and principles of: a) Improving transport choices – guidelines for planning and development (DUAP 2001) and b) The Right Place for Business and Services (DUAP 2001). Our statement of consistency is listed below this table.
5.2 Reserving Land for Public Purpose	No	N/a	There is no public open space identified for the subject site or proposed.
5.3 Development near regulated airports and defence airfields	No	N/a	The subject site is more than 6km from the Gunnedah Airport and not mapped as being in an airport buffer or zone.
5.4 Shooting Ranges	No	N/a	The subject site is not in close proximity to a shooting range and recreational land uses are prohibited in the R5 zone.

Improving transport choices – guidelines for planning and development (DUAP 2001)

The guideline embodies the critical objectives of:

- Reducing the growth in vehicle kilometers travelled (VKT);
- Improving air quality and reducing greenhouse gas emissions;
- Building more compact cities; and
- Promoting economic development and creating jobs.

The guidelines set out 10 principles of accessible development, which encourage and support development that is highly accessible by walking, cycling and public transport.

In the context of this report the proposed rezoning of the subject site to R5 Large Lot Residential is not considered to be urban land. This report focuses on improved modes of transports which do not involve the use of private motor vehicles, but given the Gunnedah population and current walkability and public transport in the R5 large lot residential zone the development site is not considered to be urban land. Therefore, these guidelines will not apply to the proposed development.

The Right Place for Business and Services (DUAP 2001).

The aims of this guideline are:

- There are development opportunities in centers for businesses and services;
- Community investment in infrastructure is protected; and
- Investor confidence in centers is maintained.

The proposed development will facilitate residential development outside of the centre of Gunnedah to aid in accommodation needs of the population to support a successful business centre. This guideline aims to reduce the need for trip generating development by grouping services and businesses in the one area and having available public transport.

The proposed development will foster the growth of Gunnedah, by providing large lot residential land, which is in demand in an existing area of residential development. The proposed rezoning will encourage private investment into land and foster growth, competition and investment confidence in the Gunnedah CBD. As part of the development of this land the land owner will contribute to the provision of services to the subject site and payment of headworks charges to maintain community infrastructure

Focus Area 6: Housing

Direction	Applicable	Consistency	Comment
6.1 Residential Zones	Yes	Yes	The subject site proposed to rezone land to a residential zone, therefore this direction is applicable. We have outlined below in greater detail how the proposed development meets the objectives of this direction.
6.2 Caravan Parks and Manufactured Home Estates	No	N/a	The proposed development is not a caravan park of manufactured home estate. Caravan Parks are prohibited in the R5 zone.

6.1 Residential Zones

Direction 6.1 Residential zones has the following objectives:

(a) encourage a variety and choice of housing types to provide for existing and future housing needs,
(b) make efficient use of existing infrastructure and services and ensure that new housing has appropriate access to infrastructure and services, and
(c) minimise the impact of residential development on the environment and resource lands

The proposed development will provide large lot residential development, a style of housing which is in high demand in Gunnedah. This development will make efficient use of existing services and infrastructure. The proposed development will include the extension of services to all lots developed at this site. Developer contributions applied to the development will ensure the proposed development does not place any burden on public infrastructure. The subject site is not of high environmental value and given the size of the holding is not considered to be resource lands. We believe this planning proposal is consistent with the objectives of Ministerial Direction 6.1 and therefore consistent with the direction.

Focus Area 7: Industry and Employment

Direction	Applicable	Consistency	Comment
7.1 Business and Industrial Zones	No	N/a	The subject site is not currently or proposed to be in a Business or Industrial Zone therefore, this direction is not applicable.
7.2 Reduction in non-hosted short term rental accommodation period	No	N/a	This direction only applies to Bryon Shire Council Area.
7.3 Commercial and Retail development along the Pacific Highway, North Coast	No	N/a	This direction does not apply to Gunnedah Shire Council.

Focus Area 8: Resources and Energy

Direction	Applicable	Consistency	Comment
8.1 Mining Petroleum and Extractive Industries	No	N/a	Mining, Petroleum and Extractive Industries are prohibited in the R5 zone of the GLEP, 2012

Focus Area 9: Primary Production

Direction	Applicable	Consistency	Comment
9.1 Rural Zones	No	N/a	This direction does not apply to Gunnedah Shire Council.
9.2 Rural Lands	Yes	Yes	The subject site is currently zoned RU4 Primary Production small lots. This direction is applicable to the development and addressed in greater detail below.
9.3 Oyster Aquaculture	No	N/a	An Oyster Aquaculture land use is not permitted in the R5 zone of the GLEP, 2012
9.4 Farmland of State and Regional Significance on the NSW Far North Coast.	No	N/a	This direction does not apply to Gunnedah Shire Council.

9.2 Rural Lands

Direction 9.2 Rural Lands has the following objectives:

- Protect the agricultural production value of rural land;
- Facilitate orderly and economic use and development of rural lands for rural and related purposes;
- Assist in the proper management, development and protection of rural lands to promote the social, economic, and environmental welfare of the state;
- Minimise the potential for land fragmentation and land use conflicts in rural areas, particularly between residential and other rural land uses;
- Encourage sustainable land use practices and encourage the ongoing viability of agriculture on rural land; and
- Support the delivery of the actions outlined in the NSW right to farm policy.

The proposed development is considered to be on marginal rural land. The size of the holding does not make agricultural pursuits viable. The soil profile on the subject site is mapped as the Fulwood's Road transferal group by the NSW Office of Environment and Heritage. The land and soil capacity mapping shows the subject site to be in an area of severe limitation due to high susceptibility of land for erosion. Therefore, we do not believe that the subject site is considered to be of high agricultural value. The subject site adjoins existing R5 Large Lot residential land and therefore this planning proposal represents the orderly development of residential land in Gunnedah. It also meets the long term strategic planning for the town's residential land and will not result in any fragmentation of rural land. This planning proposal is not expected to impact agricultural land in the area, or the farmers right to farm their property. Biodiversity will be considered through the development application process with the preparation of a BDAR report. No areas of high biodiversity or ecological value have been identified on the subject site.

There are a few existing rural land uses surrounding the subject site due to residential development to the east and steep topography and heavily timbered country to the west. This planning proposed is not expected to adversely affect any surrounding agricultural land uses or supporting infrastructure.

The subject site is appropriately located at the edge of the existing R5 Rural Residential land in Gunnedah. There is good service availability in the area, which will be extended to cover the development site. In Gunnedah there is high demand for rural residential land and this planning proposal is addressing this demand through the provision of additional residential land. We believe this planning proposal is consistent with the objectives of the Rural Lands ministerial direction.

We believe this planning proposal is consistent with all of the ministerial directions. Created under section 9.1 (2) of the Environmental Planning and Assessment Act, 1979.

SECTION C – ENVIRONMENTAL SOCIAL AND ECONOMIC IMPACT

Section C of the guideline requires a review of any environmental, social and economic impacts of the planning proposal. This section reviews applicable impacts of the proposed development.

Impact on critical habitat or threatened species, populations or ecological communities or their habitats

The subject site has a long agricultural history, with recent uses including cultivation for fodder/hay crop and cattle grazing. There are a number of native trees on the subject site, the majority of which are along the natural watercourse and an area on the water course near the western boundary, which were planted in the 1980's.

We have conducted a search of the NSW SEED portal vegetation communities on the subject site. **Figure 21** shows the extract from this database of the site. The majority of the site is mapped as PCT 0 which is non-native vegetation. There is a small area of PCT 433 *White Box grassy woodland to open woodland on basalt flats and rises in the Liverpool Plains sub-region, Brigalow Belt South Bioregion* along the watercourse and areas of PCT 1 Native Grasslands along the southern boundary of the site.

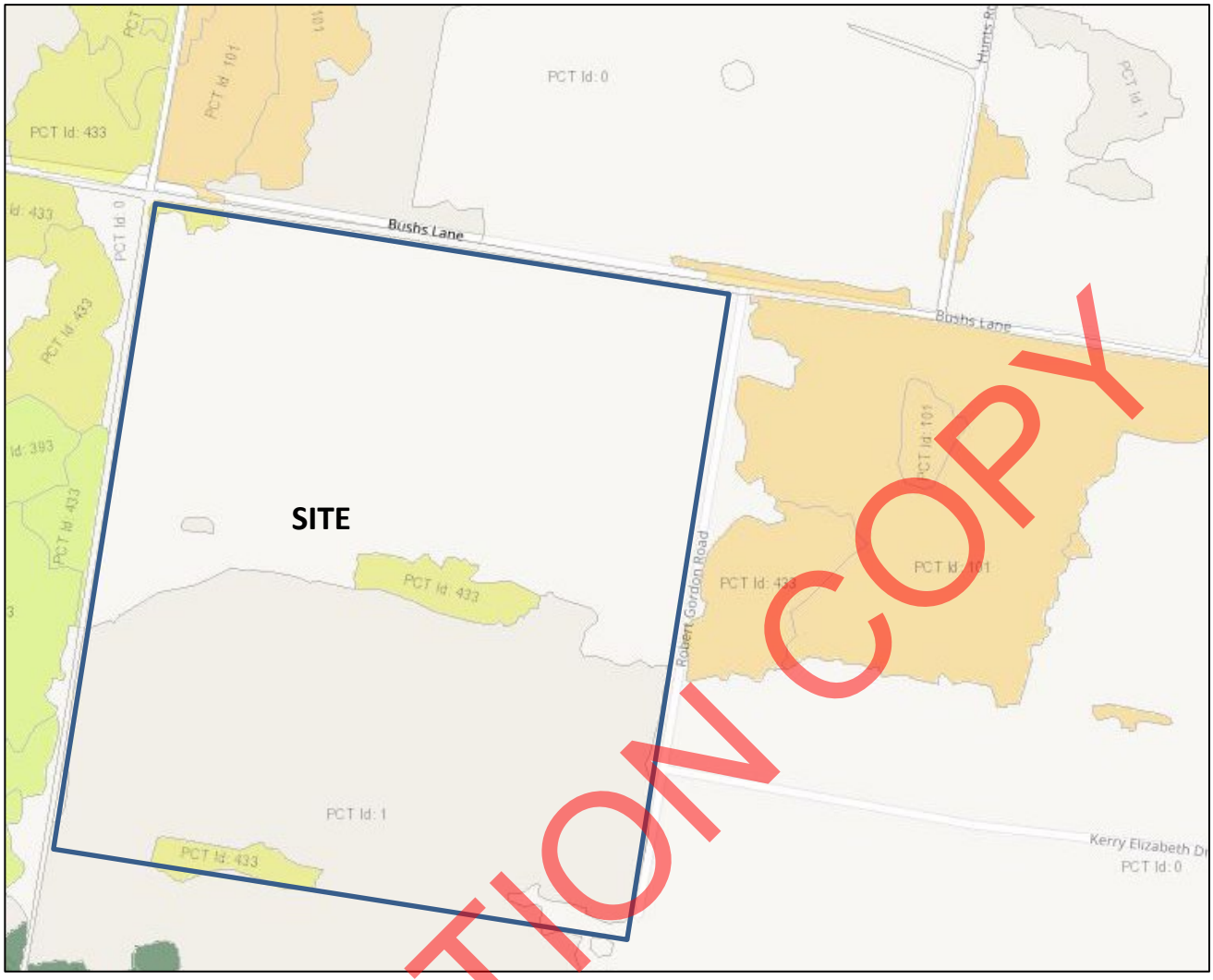

Figure 21: Vegetation Mapping (Seed Portal)

Our client has engaged Birdwing Ecological to conduct an ecological assessment of the site and prepare a Biodiversity Development Assessment Report for the development application. Ecologist Tom Pollard has conducted the field surveys over three days and provided the following summary of the site's vegetation:

> *A Biodiversity Development Assessment Report (BDAR) will be prepared for the proposal at DA stage should the planning proposal be approved. Fieldwork for the BDAR was undertaken in May and September 2021 to inform the proposed rezoning. The following findings can be reported:*
>
> *Site vegetation consists of:*
> - *cropped land (non-native vegetation) (the majority of the site*
> - *PCT101 - Poplar Box - Yellow Box - Western Grey Box grassy woodland on cracking clay soils mainly in the Liverpool Plains, Brigalow Belt South Bioregion (occurs as planted vegetation and derived grassland)*
> - *PCT434 - White Box grass shrub hill woodland on clay to loam soils on volcanic and sedimentary hills in the southern Brigalow Belt South Bioregion (occurs as shrubland without an overstorey, woodland and derived grassland)*
>
> *Most native vegetation at the site is present in a very low condition (vegetation integrity scores of <15), with only small areas of low to moderate condition vegetation present (vegetation integrity scores of between 30-40).*

Areas of PCT434 at the site are broadly consistent with the BC Act threatened ecological community 'White Box Yellow Box Blakely's Red Gum Woodland'.

Targeted threatened flora searches undertaken within areas of suitable habitat at the site did not locate any individuals.

Habitat values for threatened fauna at the site are minimal with key habitat features such as hollow-bearing trees virtually absent. However, some foraging habitat for several threatened microbats and birds could potentially occur. Targeted searches for koalas (scat searches and spotlighting) did not record any evidence of usage of areas of suitable habitat at the site.

The proposal would remove areas of PCT434 woodland that would require ecosystem credits. All other areas of vegetation to be removed have low condition below the threshold for which ecosystem credits are required. No species credits would be required. Generally, the lots are adequately sized to accommodate a driveway and building envelope without clearing of PCT434 woodland areas. However, the small size of retained areas of PCT434 within individual lots and potential future direct and indirect impacts mean that they would be considered as 100% loss in the BAM calculator and therefore require offsets.

We have conducted a NSW Bionet Database search for threatened fauna on or around the subject site. The search parameters for this search were [North:-30.96West: 150.16 East: 150.26 South: -31.06]. These search results returned a total of 1473 records of 215 species. We have listed below the species which are listed a being vulnerable or critically endangered under the Commonwealth Status. There were no sightings of any of these species recorded on the subject site. Table 2 outlines the records and **Figure 22** to **Figure 24** shows the sightings on plan. A full list of the sightings are appended to this report.

Table 2: Table of Vulnerable or Critically endangered fauna observed around the site

Species	Easting	Northing	Date of Record	Location
Koala	233458	6567512	24.08.2014	Approx. 1.7km from site (Lot 2 DP1228419)
	233850	6567157	30.06.2006	Approx. 1.3km from site (Lot 18 DP263040)
	233732	6567097	08.11.2014	Approx. 1.2km from site (Lot 17 DP263040)
	233723	6567088	11.12.2013	Approx. 1.3km from site (Lot 17 DP236040)
	233898	6567053	30.06.2006	Approx. 1.3km from site (Lot 2 DP857643)
	233967	6567028	30.06.2004	Approx. 1.2km from site (Lot 1 DP857643)
	233415	6566354	30.06.2006	Approx. 600m from site (Lot 11 DP833716)
	234163	6567265	01.11.2013	Approx. 1.6km from site on Hunts Road
	234146	6567195	08.11.2014	Approx. 1.6km from site on Hunts Road
	234645	6567177	30.06.2006	Approx. 1.7km from site (Lot 314 DP755503)
	234505	6566389	31.12.1986	Approx. 1km from site (Lot 310 DP660676)
Swift Parrot (critically endangered)	231690	6567008	25.02.1996	Approx. 2km from site (Lot 182 DP755503)
	236410	6569345	17.09.2018	Approx. 4.5km from site (Lot 4 DP1222187)
	237421	6567151	04.08.2016	Approx. 4.2km from site (Lot 118 DP1176830)
	236548	6563801	30.07.2016	Approx. 3.6km from site (Lot 75 DP1207553)
Latham's Snipe	236505	6566689	28.09.2006	Approx. 3km from site (Lot 2 DP740218)
Pink-Tailed Legless Lizard	236932	6566059	28.09.2006	Approx. 3.2km from site (Lot 118 DP1176830)
Painted Honeyeater	232106	6566689	25.02.1996	Approx. 1.7km from site (Lot 2 DP1183502)
Border Thick-tailed Gecko	232106	6566689	25.02.1996	Approx. 1.7km from site (Lot 2 DP1183502)
Grey-headed Flying Fox	233458	6567512	26.10.2018	Approx. 1.7km from site (Lot 3 DP1228419)
	236501	6569261	22.10.2012	Approx. 4.5km from site (Lot 4 DP1222187)
	235470	6564442	03.11.2015	Approx. 2.5km from site (Lot 7 DP262888)
Spotted-tailed Quoll	235236	6566268	30.06.2006	Approx. 1.6km from site (Lot 7014 DP1074337)
	236105	6565189	10.06.1997	Approx. 2.5km from site (Lot 4 DP731871)
	237341	6566723	31.12.1999	Approx. 3.8km from site (Lot 118 DP1176830)
	237105	6569189	30.06.1977	Approx. 4.8km from site (Lot 7035 DP1029310)

Corben's Long-eared Bat	237505	6566689	29.09.2006	Approx. 3.9km from site (Lot 118 DP1176830)

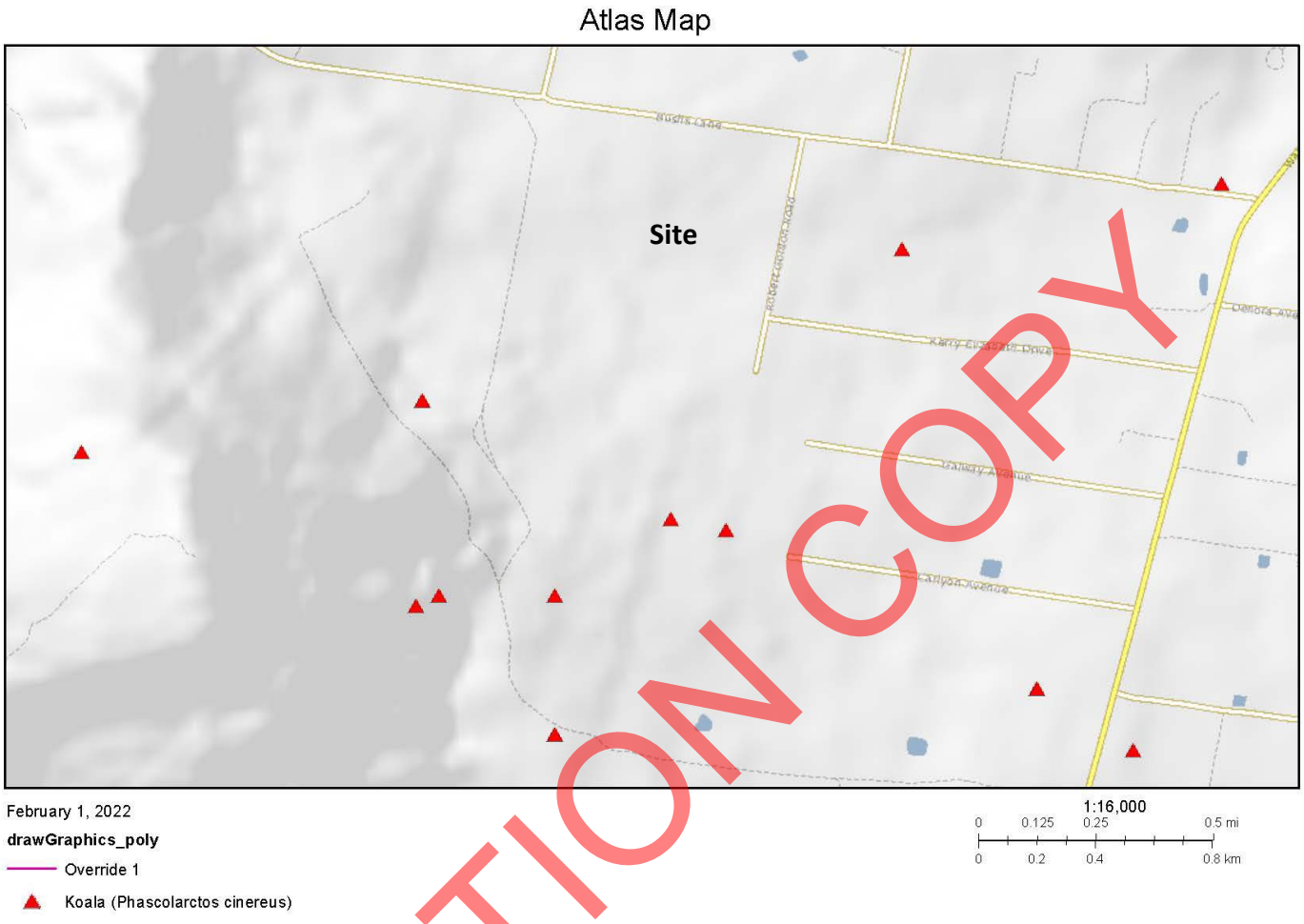

Figure 22: Map showing Koala Sightings (Bionet)

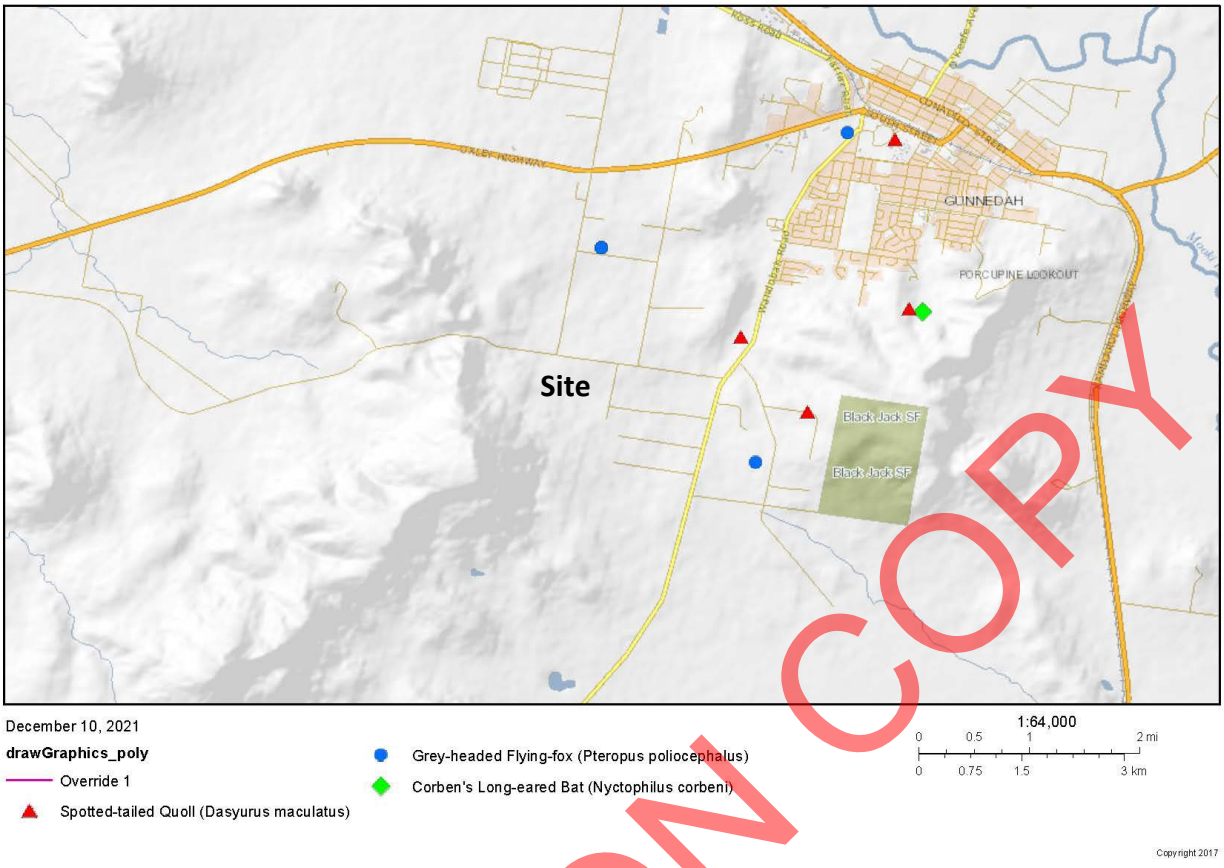

Figure 23: Map showing Spotted-tailed quoll, Grey headed flying fox and Corben's long-eared Bat sightings (Bionet)

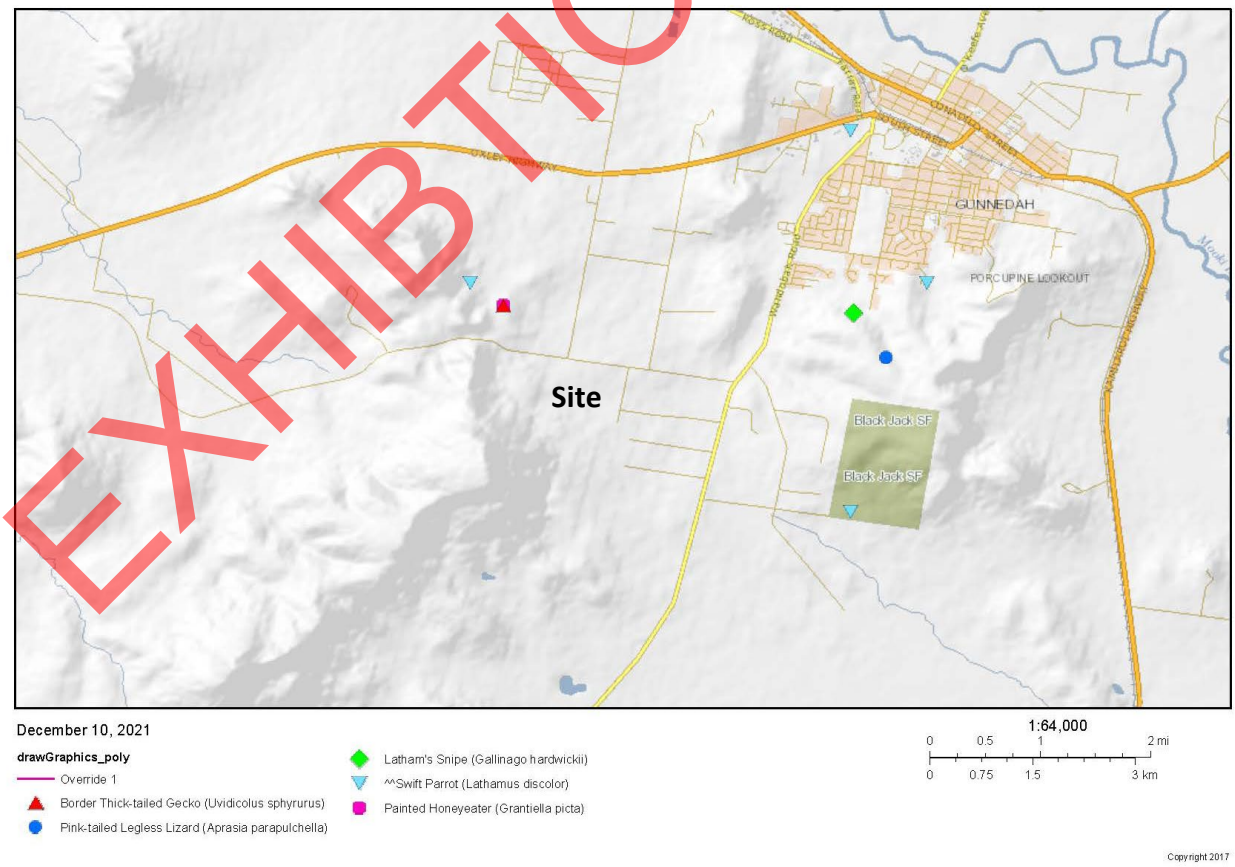

Figure 24: Map showing Border thick tailed Gecko, Pink-tailed legless lizard, Latham's Snipe, Swift Parrot and Painted Honeyeater sightings (Bionet)

Based on these searches and site inspection by Ecologist Tom Pollard of Birdwing Ecological, the site is not considered to have a significant impact on any critical habitat or threatened species, populations or ecological communities. Ecosystem credits are likely to apply to the development. The full impacts of the development and required credits or offsets will be determined during the development application phase with a BDAR report. These further detailed investigations will ensure the development would not adversely impact any critical habitat or threatened species, populations or ecological communities.

Biodiversity Offset Scheme

The Biodiversity Conservation Act 2016 is legislation which applies to the whole of NSW. The purpose of the act is to protect the following biodiversity values:

(a) vegetation integrity—being the degree to which the composition, structure and function of vegetation at a particular site and the surrounding landscape has been altered from a near natural state,

(b) habitat suitability—being the degree to which the habitat needs of threatened species is present at a particular site,

(c) biodiversity values, or biodiversity-related values, prescribed by the regulations.

The subject site is not mapped as being in an area of high biodiversity value under the Biodiversity Offset Scheme as shown in **Figure 25**. We have appended the search results.

This planning proposal is seeking a minimum lot size of 9,000 square metres. Under Clause 7.2 of the Biodiversity Conservation Regulation 2017, the allowable clearing threshold for a lot less than 1 hectare in size is 0.25 hectare, or 2,500 square metres.

The proposed development will exceed the clearing threshold with the construction of the proposed loop road and will therefore trigger a Biodiversity Development Application Report to be prepared under the Biodiversity Conservation Act. Ecologist Tom Pollard of Birdwing Ecological has been engaged to prepare the BDAR assessment. The impacts of the development have been assessed and ecosystem credits for any clearing will be applied to the development consent. This preliminary investigation has concluded that the existing vegetation is in low quality and ecosystem credit requirements will not be onerous or render the development unviable due to required offsets.

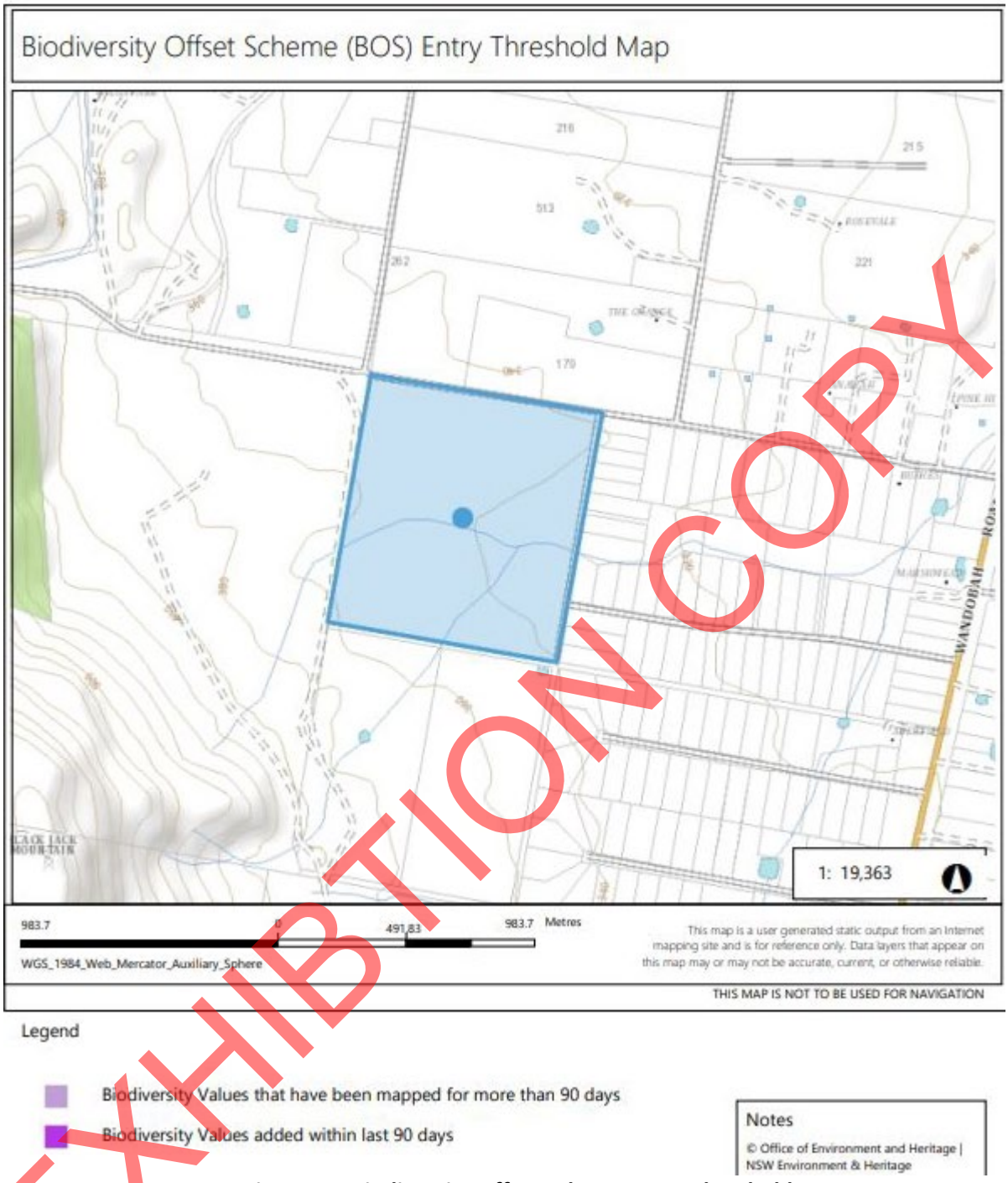

Figure 25: Biodiversity Offset Scheme Entry Threshold Map

Soil Landscape

The soil landscapes on the site have been mapped as the Fulwoods Road soil profile by the Office of Environment and Heritage on the ESpade portal. This soil landscape is described as a transferral soil with extremely long pediment footslopes comprising of coalescing alluvium fans below sandstone hills. Soils are mostly degraded very deep to giant, moderately well-drained read and brown earths with deep well drained red earths common on upper footslopes.

The soil landscape is described as having the limitations and qualities including moderate soil fertility, localised foundation hazard, widespread recharge zone, localised salinity hazard and localised gully and sheet erosion hazard.

The Fulwoods Road soil landscape is widespread around Gunnedah's residential areas and does not pose a limitation to development of houses.

Flooding

The site is not mapped as flood prone land in the Gunnedah LEP as illustrated in **Figure 16**.

Land Contamination

A search of the List of NSW Contaminated Sites Notified to the NSW OEH as at 10 December 2021 in the Gunnedah Shire did not uncover any listings on or in close proximity to the site. The search results are shown in **Table 3**:

Table 3: NSW EPA Record of Notices in the Gunnedah Shire Council LGA

Suburb	Address	Site Name	Notices related to this site
GUNNEDAH	Intersection of Henry Street and Conadilly STREET	Adjacent to Service Station	6 former
GUNNEDAH	103 Mathias ROAD	BP Depot Gunnedah	2 current
GUNNEDAH	Corner Conadilly Street & Henry STREET	BP Service Station	5 former
GUNNEDAH	61 Railway AVENUE	Former Caltex Depot	3 former
GUNNEDAH	341 Conadilly STREET	Mobil Service Station	5 former

The subject site is located adjacent to a former extractive industry, which included underground coal mining, open cut coal mining, coal loading facilities and the like. All mining activities on the adjoining property have ceased and the site is currently undergoing remediation in accordance with the resource regulator requirements.

Whitehaven Coal Limited commissioned two site investigation reports by East West Enviro Ag to determine any likelihood of contamination as a result of these previous land uses. In August 2014 five (5) samples were taken on western boundary of Lots 27 and 28 in DP755474 as shown in **Figure 26.** This testing concluded that all five (5) topsoil samples were below the threshold values for contaminated sites for residential use according to the guidelines. In October 2014 following a large rain event a second contamination instigation was undertaken by East West Enviro Ag, with five (5) additional soil samples taken along the watercourse and in the open field as shown in **Figure 27**. This assessment also concluded that all five (5) top soil samples collected from the site were below the threshold values for contaminated sites (for fine materials) for residential use according to the guidelines. The full reports have been appended to this report.

The land owner has advised that there has not been land uses on the site which could be a potential source of contamination. Therefore, based on the site sampling by East West Enviro Ag and land uses on the site, we believe the risk of contamination on the subject site would be low and there are no requirements under SEPP 55 that would prevent this property being utilised for residential holdings.

Figure 26: Map of Soil Testing locations August 2014 (East West Enviro Ag)

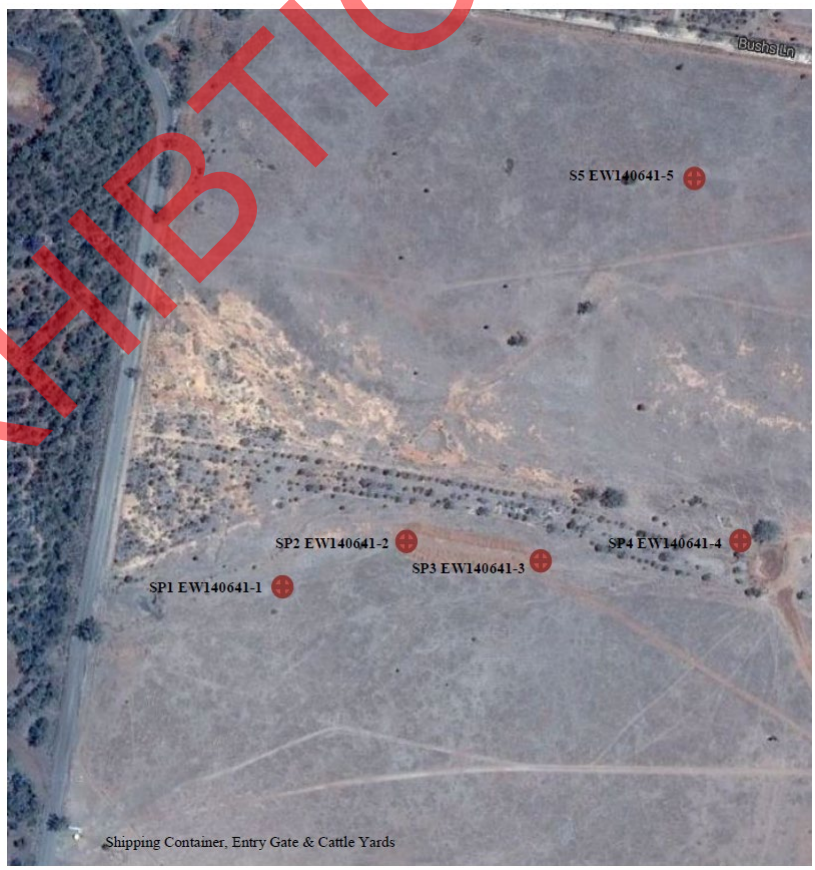

Figure 27: Map of Soil Testing locations October 2014 (East West Enviro Ag)

Bushfire Prone Land

We have conducted a search of the NSW Rural Fire Service bushfire prone land and the subject site, Lots 27 and 28 in DP755474, is not mapped as bushfire prone land. Therefore, the development would not be subject to the Rural Fires Act, 1997. There is bushfire prone land in the vicinity of the subject site as shown in **Figure 17**. We do not believe this surrounding threat of bushfire prevents the site being subdivided for rural residential purposes. In considering the subdivision lot layout a looped road has been provided to improve the safety of residents in a case of a natural disaster including bushfire. The looped road will provide two directions of travel if there are any obstructions or hazards impacting the road.

Cultural Heritage

The Gunnedah Local Environment Plan 2012 Heritage Map does not record any items of heritage significance on the site or in the vicinity of the subject site.

A search of the Office of Heritage and Environment Aboriginal Heritage Information Management System (AHIMS) for a 50 metre buffer around Lots 27 and 28 in DP 755474 has shown that there is one aboriginal site recorded on the subject land. The search results of this enquiry are attached to this report. In recognition that the proposed subdivision may have an impact on cultural heritage Patrick Gaynor has been engaged to conduct an archaeological assessment for the site. This assessment is provided in the technical information appended to this report.

The archaeological assessment found three artefacts of Aboriginal Cultural Heritage. These artefacts are described in section B of this report. The archaeological report concluded that with the recommended fencing of sites to prevent disturbance and due diligence by construction contractors for incidental finds, the proposed subdivision is not likely to significantly affect Aboriginal cultural heritage in this area.

Economic Impacts

The proposed development is aligned with the Gunnedah Economic development strategy as described in section B of this report and will provide additional land suitable for housing in a land size which has short supply currently in Gunnedah. Future development of the site will require developer contributions to offset any impacts on community infrastructure. We believe this planning proposal will have a positive economic outcome for Gunnedah.

Social Impacts

Increasing housing availability has a range of positive social impacts. It allows residences increased choice in land size, location and dwelling types available in the town. This can also open up more affordable housing with people building new houses and opening up existing dwellings within the town limits. Increase in population allows public authorities to deliver a higher level of service to its residence. Therefore, the proposed development has the potential to attract new residences to Gunnedah. It also has the potential to improve services within this immediate location, with public transports more viable with increased population. Developer contributions required at the time of subdivision ensure any development does not negatively impact the wider community.

We have reviewed the likely environmental effects, as a result of the planning proposal and believe the proposed development, with appropriate mitigation measures nominated during the development application stage will not have a significant environmental, social or economic impact which would prevent support for this planning proposal.

SECTION D – INFRASTRUCUTRE (LOCAL, STATE AND COMMONWEALTH)

Is there adequate public infrastructure for the planning proposal?

The guideline states that this question typically applies to planning proposals which will result in 150 or more additional residential lots, substantial urban renewal, infill development or development that will result in additional demand of infrastructure.

The proposed development will result in 61 additional residential lots. The site servicing has been reviewed in section B principle 1 of the Interim Settlement Planning Principles, as having adequate existing infrastructure to support the

planned residential development. There is not considered to be any shortfalls in infrastructure nor significant demands on public utilities associated with this rezoning proposal.

SECTION E – STATE AND COMMONWEALTH INTERESTS

There has not been any State or Commonwealth Government authority consultation as part of this gateway application and given the nature of the development, none is deemed necessary.

PART FOUR – MAPS

The following Gateway Application Maps have been prepared and appended to this report.

Gateway Application Maps

1. Map showing site on the existing Land Zoning Map LZN-005A in the Gunnedah Local Environment Plan 2012
2. Map showing proposed change to Land Zoning Map LZN-005A in the Gunnedah Local Environment Plan 2012
3. Map showing existing Land Size Map LSZ_005A in the Gunnedah Local Environment Plan 2012
4. Map showing proposed Land Size Map LSZ_005A in the Gunnedah Local Environment Plan 2012

PART FIVE – COMMUNITY CONSULTATION

The guideline states that the gateway determination (stage 5 of the rezoning proposal) will specify the required public exhibition period. Timeframes are based on the complexity of the planning proposal and vary between 10 and 30 working days.

The LEP guide defines a low impact proposal as a planning proposal that in the opinion of the person making the gateway determination is:

- Consistent with the patterns of surrounding land use zones and/or land uses
- Consistent with the strategic planning framework
- Presents no issues with regard to infrastructure servicing
- Not a principal LEP
- Does not reclassify land.

It is the opinion of the author of this application that this gateway application meets these requirements and should be considered a low impact proposal.

Community consultation for low impact proposals is undertaken for 14 days in the following manner as outlined in the LEP guide.

- Notification on the Planning Portal;
- Notification in the local newspaper;
- Notification on the website of the Gunnedah Shire Council; and
- Notification in writing to affected and adjoining landholders.

The guideline states that the notice must describe and identify the following:

- The objective or intended outcomes of the planning proposal;
- The land affected by the planning proposal;

- Where people can view the proposal;
- Contact details for submissions; and
- Whether council is the designated LPMA

The guideline states the following information must be made available during the exhibition period

- The planning proposal in the form approved for public exhibition by the Gateway Determination;
- The Gateway determination; and
- All relevant additional information relied upon by the planning proposal.

PART SIX – PROJECT TIMELINE

The project timeframe will be based on the date of gateway determination by the department and time frame for Gunnedah Shire Council to make the amendments to the Gunnedah Local Environment Plan. As these processes are removed from our control it is not possible for us to determine a project timeline.

Our client wishes to finalise this process as quickly as possible to enable lodgement of the development application for the proposed subdivision. We have suggested a preliminary timeframe which would be suitable for Council's review

Stage	**Timeframe/date**	**Working Days**
Consideration by Council	7/02/22 to 25/02/22	
Council decision	16/03/22	
Gateway determination	28/6/2023	
Update of reports to meet conditions of approval	31/7/23	
Pre-exhibition	31/7/23 to 14/8/23	10 Working Days
Commencement and completion of public exhibition period	14/8/23 to 11/09/23	20 Working Days
Consideration of submissions	11/09/23 to 25/09/23	10 Working Days
Post-exhibition review and additional studies	9/10/23 to 13/11/23	20 Working Days
Submission to the Department for finalisation (where applicable)	13/11/23	30 Working Day
Gazettal of LEP amendment	28/12/2023 (6 months post Gateway Determination)	

CONCLUSION

This gateway proposal will enable 210 Bushs Lane, Gunnedah to be subdivided into sixty one (61) rural residential lots with an area exceeding 9,000 square metres, for residential occupation. The subject site is located in an area of Gunnedah which has been identified since 1981 in strategic planning for residential expansion within Gunnedah Shire. Recent water service upgrades have allowed this holding to be included in land recommended for rezoning, as reticulated water can be supplied at the site. The site is located adjacent to the current R5 Large Lot Residential zone and well serviced along part of the site with efficient extension of services available. The proposed development meets the requirements of the ministerial directions and both local and regional planning provisions and will allow the site to be developed into rural residential holdings. This will meet a shortcoming in residential supply in Gunnedah and assist in making Gunnedah a vibrant place to live.

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MAP 1 & 2:

GUNNEDAH LOCAL ENVIRONMENTAL PLAN, 2012 - LAND ZONING MAPS LNZ_005A

EXISTING LAND ZONING MAP LNZ_005A
PROPOSED REZONING TO R5 LARGE LOT RESIDENTIAL MAP LZN_005
GUNNEDAH LOCAL GOVERMENT AREA

DATE: 2 FEBRUARY 2022

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Gunnedah Local Environmental Plan 2012

Shire of Gunnedah
Land of Opportunity

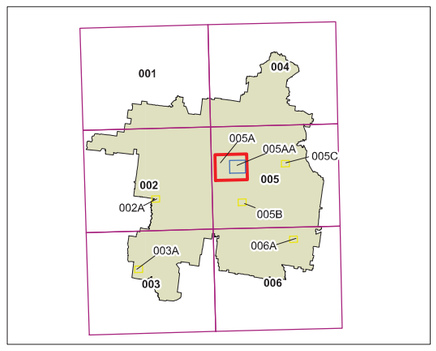
Land Zoning Map - Sheet LZN_005A

Zone

B2	Local Centre
B4	Mixed Use
B5	Business Development
E1	National Parks and Nature Reserves
E3	Environmental Management
IN1	General Industrial
IN3	Heavy Industrial
R2	Low Density Residential
R3	Medium Density Residential
R5	Large Lot Residential
RE1	Public Recreation
RE2	Private Recreation
RU1	Primary Production
RU3	Forestry
RU4	Primary Production Small Lots
RU5	Village
RU6	Transition
SP1	Special Activities
SP2	Infrastructure

Cadastre

Base data 26/3/2012 ©
Land and Property Information (LPI)



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MGA Zone 56

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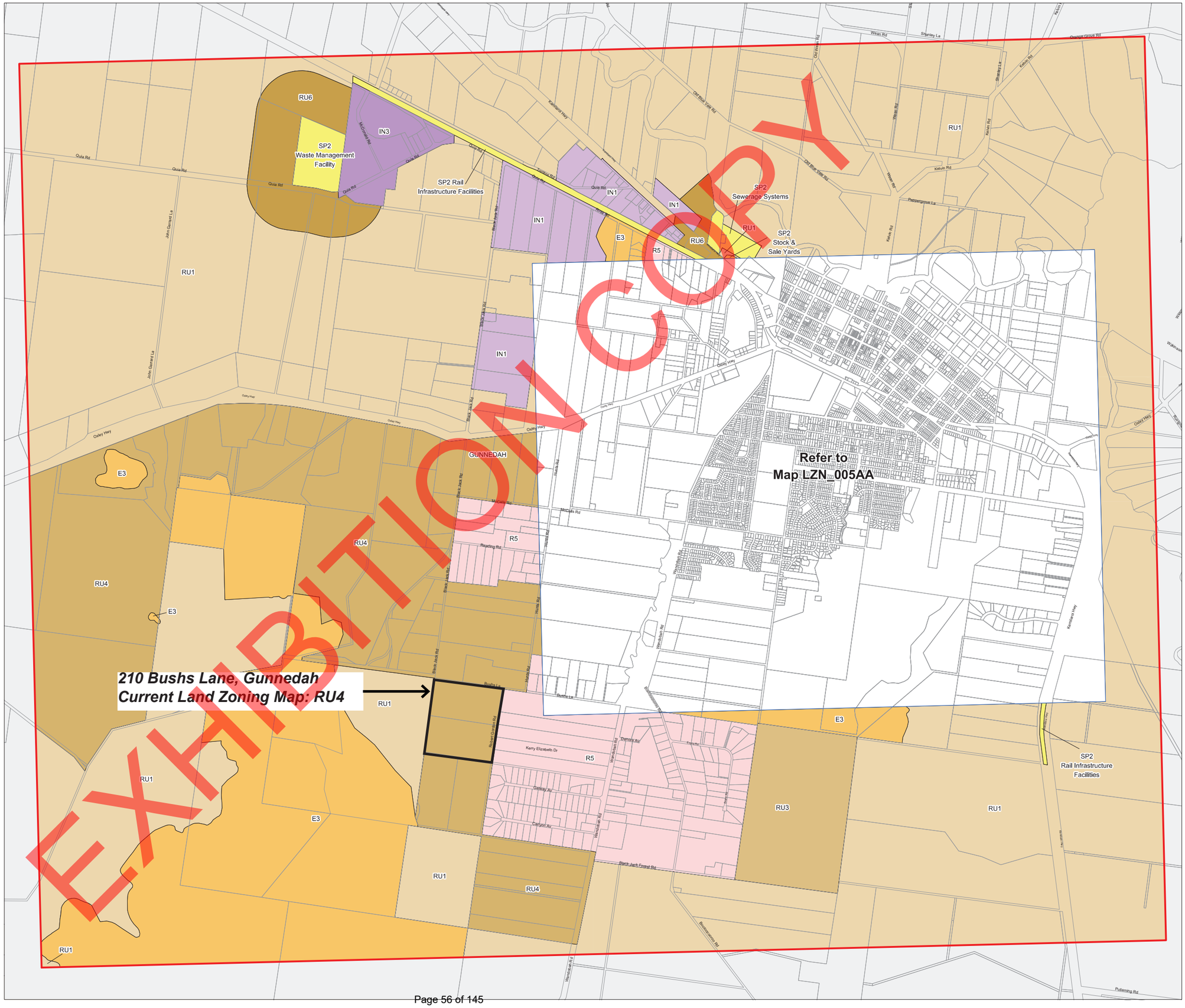

Gunnedah Local Environmental Plan 2012

Shire of Gunnedah
Land of Opportunity

Land Zoning Map - Sheet LZN_005A

Zone

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RE2	Private Recreation
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RU3	Forestry
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SP2	Infrastructure

Cadastre

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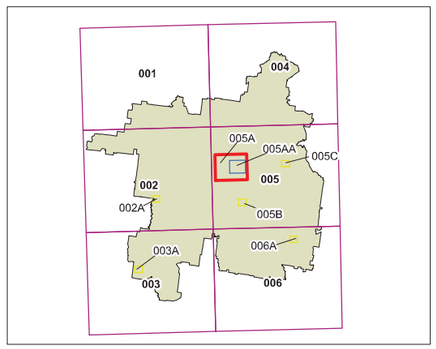
Land and Property Information (LPI)



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Projection: GDA94
MGA Zone 56

Map Identification Number:

3550_COM_LZN_005A_040_20150129

210 Bushs Lane, Gunnedah
Proposed Land Zoning Map: R5

Refer to Map LZN_005AA

MAP 3 & 4:

GUNNEDAH LOCAL ENVIRONMENTAL PLAN, 2012 - LOT SIZE MAPS LSZ_005A

EXISTING LOT SIZE MAP LSZ_005A
PROPOSED REZONING TO 1.2 HA MINIMUM LOT SIZE MAP LSZ005
GUNNEDAH LOCAL GOVERMENT AREA

DATE: 28 JULY 2023

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Gunnedah Local Environmental Plan 2012

Shire of Gunnedah
Land of Opportunity

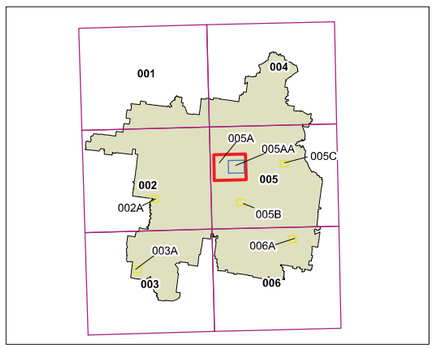
Lot Size Map - Sheet LSZ_005A

Minimum Lot Size (sq m)

G	450
O	650
U	1000
V	2000
W	3000
X	6200
Y	1.2 ha
AB1	10 ha
AB4	40 ha
AE	200 ha

Cadastre

Base data 26/3/2012 ©
Land and Property Information (LPI)



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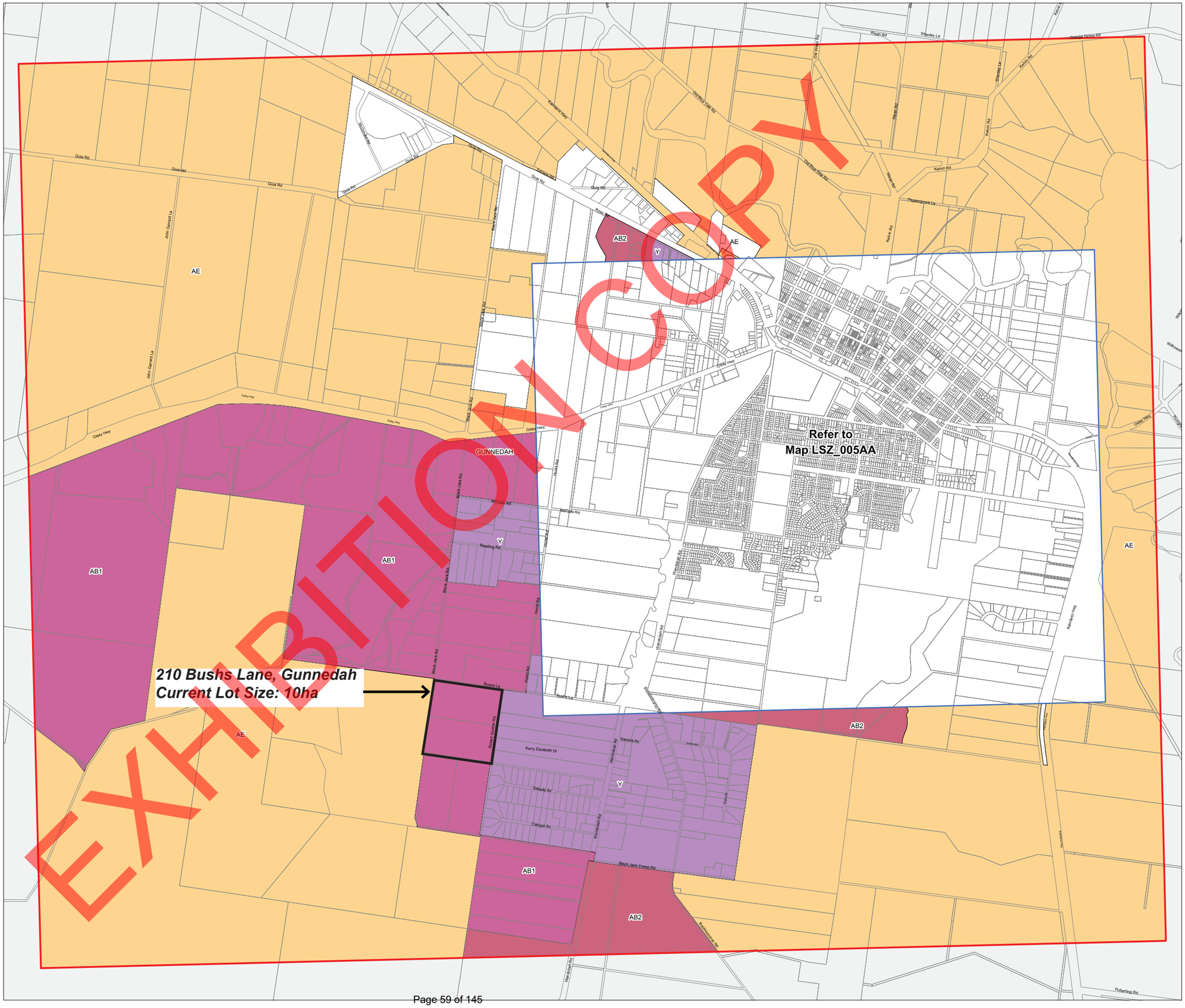


Gunnedah Local Environmental Plan 2012

Shire of Gunnedah
Land of Opportunity

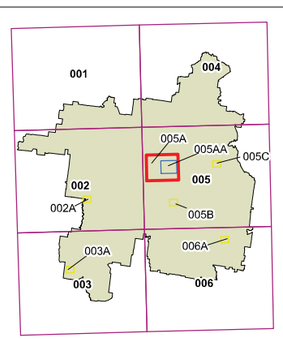
Lot Size Map - Sheet LSZ_005A

Minimum Lot Size (sq m)

G	450
O	650
U	1000
V	2000
W	3000
X	6200
Y	1.2 ha
AB1	10 ha
AB4	40 ha
AE	200 ha
Z	9000

Cadastre

Base data 26/3/2012 ©
Land and Property Information (LPI)



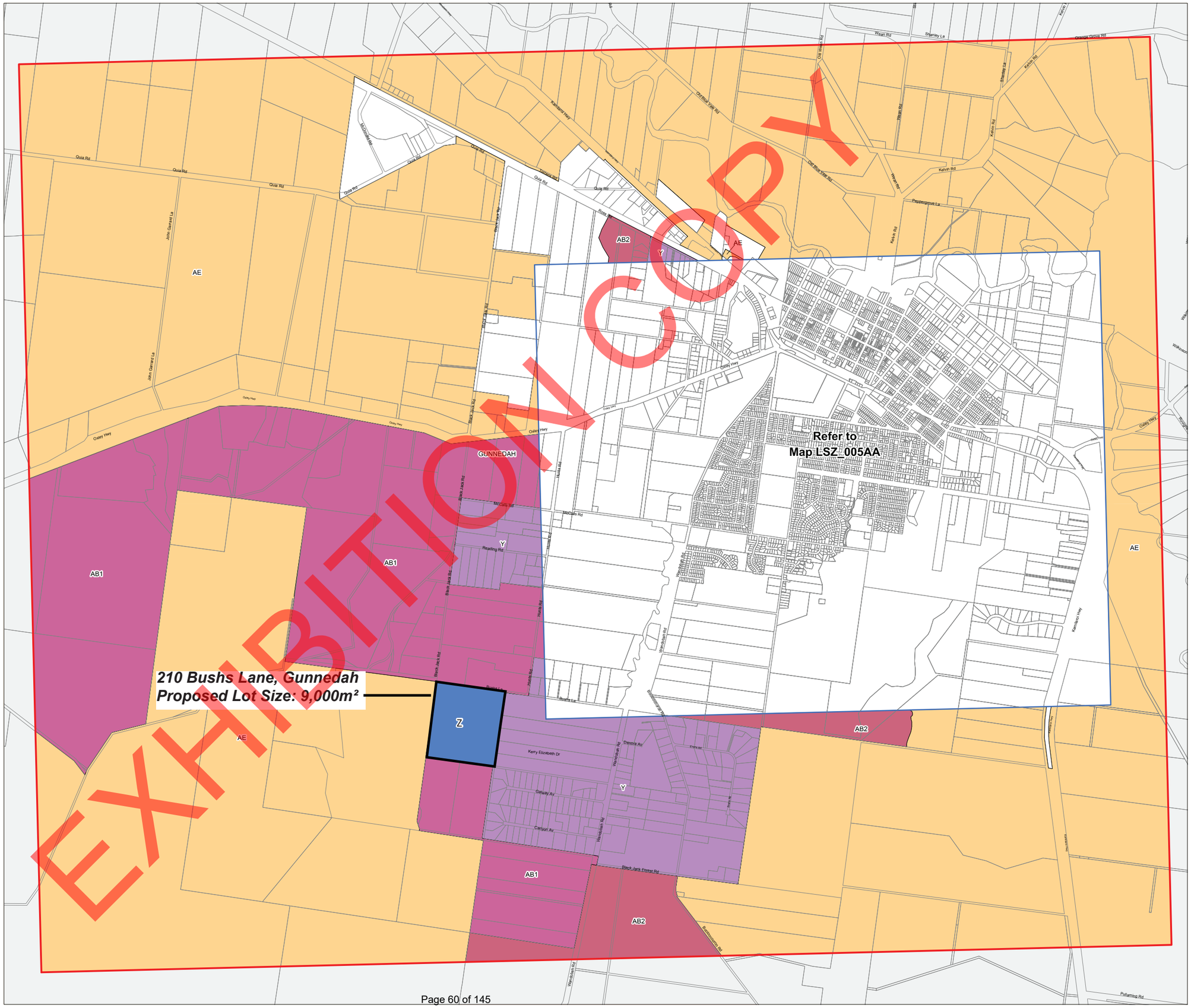
N

0 1 2
Kilometres

SCALE 1:40,000 @ A3

Projection: GDA94
MGA Zone 56

Map Identification Number:
3550_COM_LSZ_005A_040_20141107



APPENDIX A

TITLE DOCUMENTS

- Portion 27 Plan
- Portion 28 Plan

Stewart Surveys Pty Ltd
ABN 65 002 886 508
109 Conadilly Street
PO Box 592
Gunnedah NSW 2380
T 02 6742 2966
F 02 6742 0684
cstewart@stewartsurveys.com

+9°33'

1900/5446

Plan of Portion 27

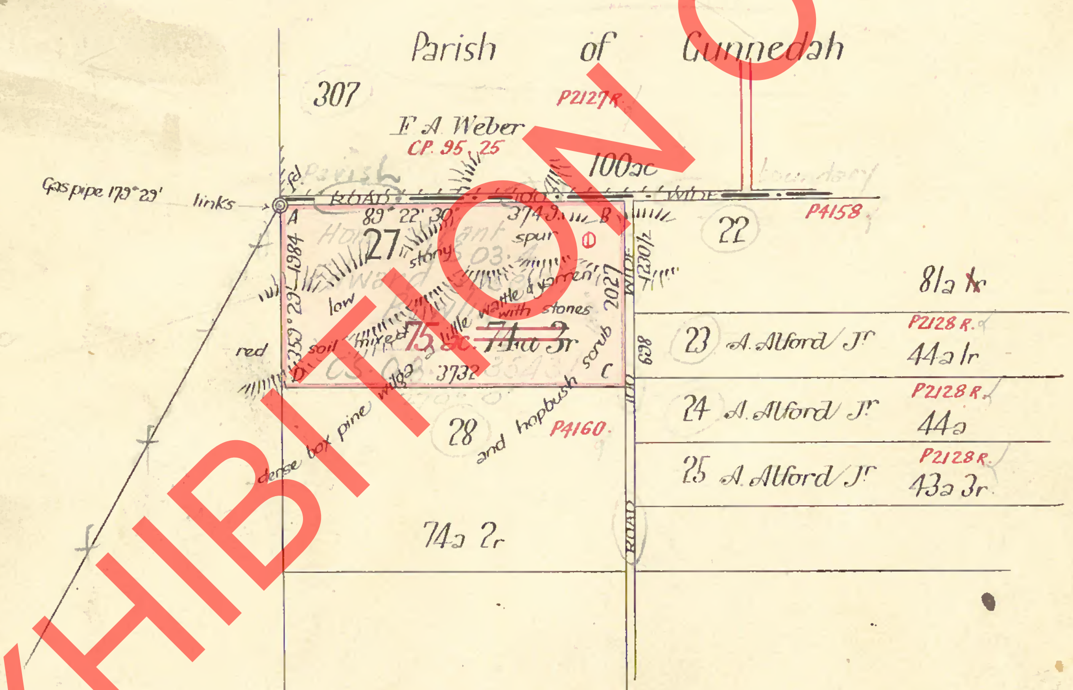
County of Pottinger   Parish of Black Jack
Land District of Gunnedah   Land Board District of Tamworth

Resumed Area No.   Pastoral Holding Central Division

Applied for under the   Section of the Crown Lands Act of 188   by

Within the Population Area of Gunnedah Proc^d 26^th Sept^r 88, Revoked 14^th January 1905
Within H.S. Area 734, notif^d 6^th March 01.
H.S. 01/18 of 6^th June by Robert Patrick Corcoran Confirmed 2^nd July 01 Forf^d 18^th Feb^y 03
H.S. 03/4 of 11^th June by ~~Lloyd~~ Joseph J. Bowting Conf^d 15^th Sep^r 03. Now Hom. Grant Vide C.S.08.3543 Grant surrendered
① C.P. 22.17 (Conv^d Nov^r 14^th) Robert Mitchell Walker Now Rural Bank of New South Wales. Sale Completed
Sales 49-13527.

+9°33'



Azimuth taken from C.D.
Field Book Vol.7012 Folios 79, 80

Reference to Corners

Corner	Bearing	From	Links	N^o on Tree
A	167° 50'	Box	36	27
B	241 50	Pine	51½	27
C	312 35	Box	49½	27 28
D	10 57	Box	22½	27 28

Value of Improvements Nil

Reference to Traverse

Line	Bearing	Distance

I hereby certify that I in person made and on the 15 May 1900 completed the survey represented on this plan on which are written the bearings and lengths of the lines measured by me and I declare that the survey has been executed in accordance with the regulations published for the guidance of Licensed Surveyors and the practice of the Department of Lands.

[signature] Licensed Surveyor

Transmitted to the District Surveyor with my letter of 21 June No. 00/32

Voucher No. 00/31 Passed £ 5..12..1
Calculation Book No. 2051 Folio 76
Checked and Charted R. R. Smith 3/7/00
Examined
Plan approved   1

Traced for helio 2.10.00

Scale 20 Chains to an Inch.

P4159.1781

4159-1781

+7°33'

1900/5447
ENCLOSURE.
OFFICE TAMWORTH

PLAN OF PORTION 28

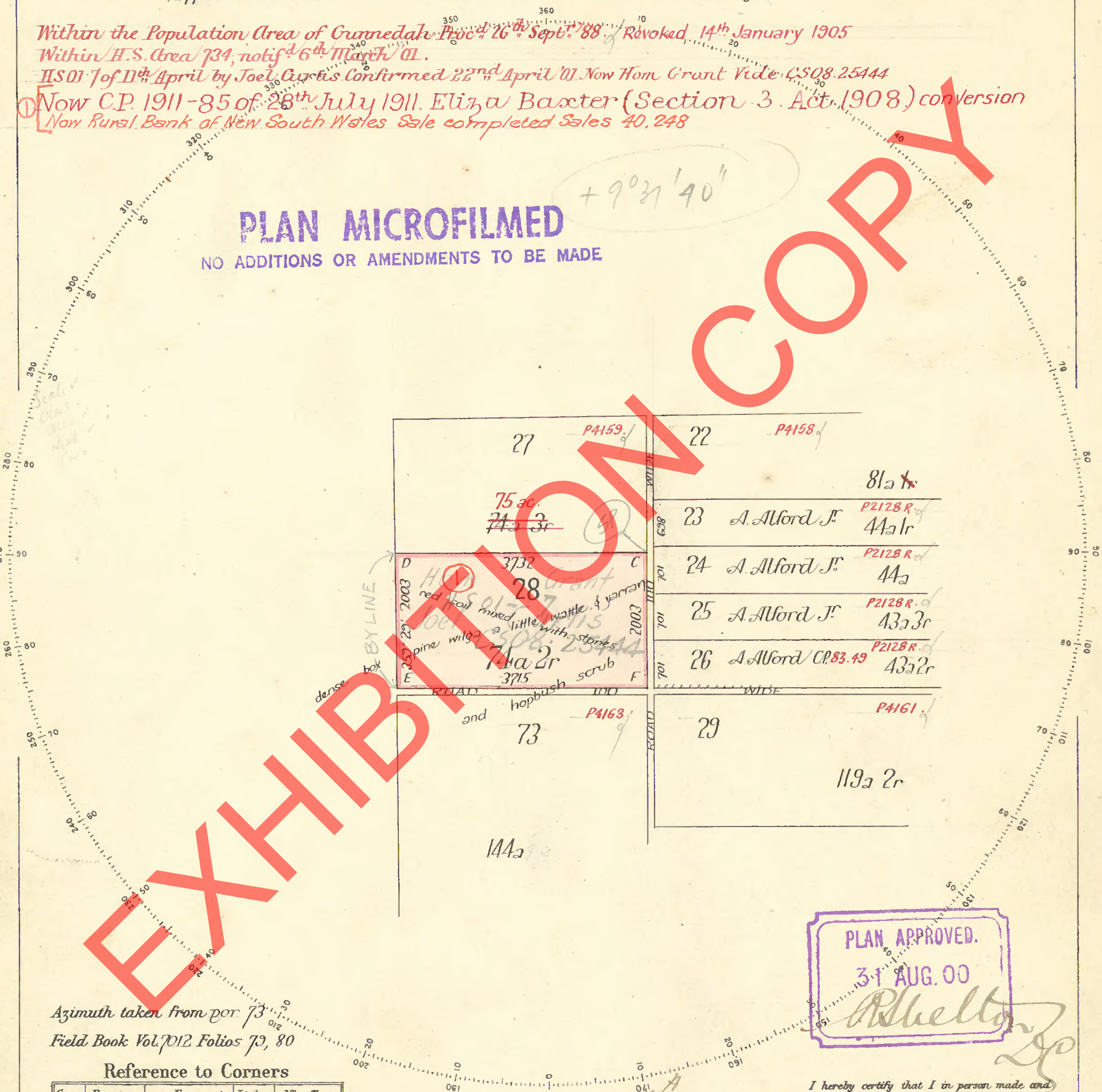
County of Pottinger Parish of Black Jack
Land District of Gunnedah Land Board District of Tamworth
Resumed Area No. Pastoral Holding Central Division
Applied for under the Section of the Crown Lands Act of 188 by

Within the Population Area of Gunnedah Proc.d 26th Sept. 88 / Revoked 14th January 1905
Within H.S. Area 734, notifd 6th March 01.
HS01/1 of 11th April by Joel Curtis Confirmed 22nd April 01. Now Hom. Grant Vide CS08.25444
(1) Now C.P. 1911-85 of 28th July 1911. Eliza Baxter (Section 3. Act 1908) conversion
Now Rural Bank of New South Wales Sale completed Sales 40,248

+9°31'40"

PLAN MICROFILMED
NO ADDITIONS OR AMENDMENTS TO BE MADE

EXHIBITION COPY



Azimuth taken from por 73
Field Book Vol. 7012 Folios 79, 80

PLAN APPROVED.
31 AUG. 00
R. Shelton

Reference to Corners

Corner	Bearing	From	Links.	No. on Tree
C	312° 35'	Box	49½	27 28
D	10 52	Box	22½	27 28
E	291 10	Box	21½	28
F	308 0	Box	42	28

Value of Improvements nil

Reference to Traverse

Line	Bearing	Distance

I hereby certify that I in person made and on the 15th May 1900 completed the survey represented on this plan on which are written the bearings and lengths of the lines measured by me and I declare that the survey has been executed in accordance with the regulations published for the guidance of Licensed Surveyors and the practice of the Department of Lands.

Geo. Yoder
Licensed Surveyor

Transmitted to the District Surveyor with my letter of 21 June No. 00/33

Voucher No. 00/32 Passed £ 4 „ 3 „ 9. E.a.D. 29/8/00
Calculation Book No. 205/ Folio 77
Checked and Charted R.K. Smith 3/7/00
Examined Edm. W. Bailey 29th Aug. 1900.
Plan approved

Certified copy to Head Office 17. 10. 00

Traced for helio 3.10.00

Scale 20 Chains to an Inch.

P4160.1781

4160-1781

APPENDIX B – CONTAMINATION INVESTIGATIONS

East West Enviro Ag – Soil Investigations Melville Haul Road, Whitehaven Washery, Gunnedah, dated 29th August 2014

East West Enviro Ag – Soil Investigations (2) Melville Haul Road, Whitehaven Washery, Gunnedah, dated 23rd October 2014

Stewart Surveys Pty Ltd
ABN 65 002 886 508
109 Conadilly Street
PO Box 592
Gunnedah NSW 2380
T 02 6742 2966
F 02 6742 0684
cstewart@stewartsurveys.com

82 Plain Street Tamworth NSW 2340
P 02 6762 1733 F 02 6765 910 9
admin@eastwestonline.com.au
www.eastwestonline.com.au
ABN 82 125 442 382

29th August 2014

Wayne Parkes
Whitehaven Coal Ltd
Gunnedah
E: wparkes@whitehavencoal.com.au

RE: SOIL INVESTIGATION MELVILLE HAUL ROAD
WHITEHAVEN WASHERY, GUNNEDAH

Dear Wayne,

The scope of work is to use the five samples to indicate the likely contamination status of proposed development areas and show that minimal contamination remains from previous use. All samples were tested for contaminant analysis including total recoverable hydrocarbons (TRH), Benzene, Toluene, Ethyl-benzene, Xylene (BTEX) and eight heavy metals (As, Cd, Cr, Cu, Pb, Hg, Ni, & Zn) at Envirolab (NATA accreditation 2901). The full laboratory report of results for the soil samples is enclosed (Reference Envirolab 114643).

Five (5) soils were collected by East West and the customer from targeted areas along Melville Haul Road, Gunnedah on both 13th and 14th of August 2014. Table 1 contains a soil sample log of those samples collected from the upper layer (0-0.10m) as it is these soils which are most likely to be contaminated and come into contact with future uses of the area or construction workers.

Table 1: Soil Sample Log

Sample ID	GPS Easting	GPS Northing	Depth	Description
EW140537-2	150°12'116"	-31°01'916"	0-0.1m	SP1 Side of road (Sample collected by WP)
EW140537-3	150°12'099"	-31°01'007"	0-0.1m	SP2 Adjacent gate & shipping container (EW)
EW140537-4	150°12'112"	-31°00'949"	0-0.1m	SP3 Half Way to Gully/Tree (EW)
EW140537-5	150°12'134"	-31°01'838"	0-0.1m	SP4 Crest of ridge (EW)
EW140537-6	150°12'158"	-31°01'717"	0-0.1m	SP5 Adjacent to Blackjack Road and intersection (EW)

I have compiled a results summary of significant analysis results for the soil (Our project reference EW140537) in Table 2 over page. The first column contains analytes (element and compounds tested for), the second column is the units of the results (i.e. mg/kg is milligram per kilogram ~ppm of soil), the third to seventh columns contain the validation results for the soil samples collected. The eighth to tenth columns display the **maximum permissible concentration** (MPC), which is the 'concentration of a contaminant that fully protects 95% of the species in an ecosystem. The Guidelines have been located through the NSW Environment and Protection Authority (EPA) and they indicate suitable threshold values for contaminants in soil from the appropriate Guideline thresholds outlined in the

National Environment Protection (Assessment of Site Contamination) Measure 1999 (April 2013), NEPC 2013, Canberra.

Figure 1: Adjacent to Sample 2, EW140537-3

Figure 2: Adjacent to Sample 3, EW140537-4

Figure 3: Sample 4, EW140537-5

Figure 4: Sample 5, EW140537-6

Figure 5: Mud Map of Sample Collection (Approximate)

The basis on which I selected information from the enclosed Envirolab Data for the results summary was to identify those contaminants that recorded a measurement above the lowest obtainable reading (LOR or limit of detection). Levels that measure below the instrument's level of detection are typically below guideline limits for contaminants. I reviewed the quality control data and I did not incorporate the contained information into the summary as there were no anomalies that needed to be highlighted.

Table 2: Results Summary

ANALYTE	Units	SP1 140537-2	SP 2 140537-3	SP 3 140537-4	SP 4 140537-5	SP 5 140537-6	DECC Guidelines NEPM Standard Residential	DECC Guidelines NEPM Limited Residential	DECC Guidelines NEPM Schedule B Industrial
Arsenic	*Mg/kg*	5	<4	4	<4	<4	***<100***	***<500***	***<3000***
Cadmium	*mg/kg*	<0.4	<0.4	<0.4	<0.4	<0.4	***<20***	***<150***	***<900***
Chromium	*mg/kg*	8	25	18	9	27	***<100***	***<500***	***<3600***
Copper	*mg/kg*	15	19	22	10	9	***<6000***	***<30000***	***<240000***
Lead	*mg/kg*	11	14	13	12	12	***<300***	***<1200***	***<1500***
Mercury	*mg/kg*	<0.1	<0.1	<0.1	<0.1	<0.1	***<40***	***<120***	***<730***
Nickel	*mg/kg*	15	31	26	11	16	***<400***	***<1200***	***<6000***
Zinc	*mg/kg*	160	65	75	33	26	***<7400***	***<60000***	***<400000***
TRH C6-C10 Fraction	*mg/kg*	<25	<25	<25	<25	<25	***<45***	-	-
TRH >C10-C16 Fraction	*mg/kg*	<50	<50	53	<50	<50	***<110***	-	-
TRH >C16-C34 Fraction	*mg/kg*	180	140	250	<100	<100	***<300 coarse <1300 fine***	-	***<1700 coarse <2500 fine***
TRH >C34-C40 Fraction	*mg/kg*	<100	<100	<100	<100	<100	***<2800 coarse <5600 fine***	-	***<3300 coarse <6600 fine***
Benzene	*mg/kg*	<0.2	<0.2	<0.2	<0.2	<0.2	***<0.5***	-	-
Toluene	*mg/kg*	<0.5	<0.5	<0.5	<0.5	<0.5	***<160***	-	-
Ethylbenzene	*mg/kg*	<1	<1	<1	<1	<1	***<55***	-	-
Xylene (o, m & p)	*mg/kg*	<2	<2	<2	<2	<2	***<40***	-	-
Naphthalene	*mg/kg*	<1	<1	<1	<1	<1	***<3***	-	-

Standard Residential: *is residential with garden/accessible soil (home grown produce contributing less than 10% of vegetable and fruit intake: no poultry); this category includes children's daycare centres, kindergartens, preschools and primary schools.*
Limited Residential: *where there are minimal opportunities for soil access: includes dwellings with fully and permanently paved yard space such as high-rise apartments and flats. This classification does not include public parks and gardens or residential with substantial vegetable gardens and poultry.*
Industrial/Commercial*: includes premises such as shops and offices as well as factories and industrial sites*

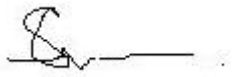
Overall Impressions:

All five (5) top soils collected from the site at Melville Haul Road, Gunnedah were below the threshold values for contaminated sites for residential use according to the Guidelines.

This report has been prepared for use by the client who has commissioned the works in accordance with the project brief only. This report does not provide a complete assessment of the environmental integrity of the site and is limited by the scope as defined above.

Please feel free to contact me if you have any questions.

Yours faithfully,



Stephanie Cameron.
Laboratory Operations Manager
Independent consultant for agriculture & the environment
(B.App.Sci Biological & Chemical Technologies)

Enc. *Envirolab Certificate of Analysis 114643*
East West Lab Analysis EW140537

82 Plain Street Tamworth NSW 2340
P 02 6762 1733 F 02 6765 910 9
admin@eastwestonline.com.au
www.eastwestonline.com.au
ABN 82 125 442 382

23rd October 2014

Wayne Parkes
Whitehaven Coal Ltd
Gunnedah
E: wparkes@whitehavencoal.com.au

RE: SOIL INVESTIGATION (2) MELVILLE HAUL ROAD
WHITEHAVEN WASHERY, GUNNEDAH

Dear Wayne,

The scope of work is to use the five samples to indicate the likely contamination status of proposed development areas and show that minimal contamination remains from previous use. All samples were tested for contaminant analysis including total recoverable hydrocarbons (TRH), Benzene, Toluene, Ethyl-benzene, Xylene (BTEX) and eight heavy metals (As, Cd, Cr, Cu, Pb, Hg, Ni, & Zn) at Envirolab (NATA accreditation 2901). The full laboratory report of results for the soil samples is enclosed (Reference Envirolab 117092).

Five (5) soils were collected by East West from targeted areas along in a gully located adjacent to Melville Haul Road, Gunnedah on 2nd October 2014. Table 1 contains a soil sample log of those samples collected from the upper layer (0-0.10m) as it is these soils which are most likely to be contaminated and come into contact with future uses of the area or construction workers.

Table 1: Soil Sample Log

Sample ID	GPS Easting	GPS Northing	Depth	Description
EW140641-1	150°12'210"	-31°00'887"	0-0.1m	SP1 Head of gully – floor
EW140641-2	150°12'263"	-31°00'362"	0-0.1m	SP2 Floor of gully adjacent to soil stockpile
EW140641-3	150°12'376"	-31°00'881"	0-0.1m	SP3 Floor of gully below soil stockpile
EW140641-4	150°12'503"	-31°00'876"	0-0.1m	SP4 Overflow drain below dam
EW140641-5	150°12'474"	-31°00'785"	0-0.1m	SP5 Crest of ridge mid paddock

I have compiled a results summary of significant analysis results for the soil (Our project reference EW140641) in Table 2 over page. The first column contains analytes (element and compounds tested for), the second column is the units of the results (i.e. mg/kg is milligram per kilogram ~ppm of soil), the third to seventh columns contain the validation results for the soil samples collected. The eighth to tenth columns display the **maximum permissible concentration** (MPC), which is the 'concentration of a contaminant that fully protects 95% of the species in an ecosystem. The Guidelines have been located through the NSW Environment and Protection Authority (EPA) and they indicate suitable threshold values for contaminants in soil from the appropriate Guideline thresholds outlined in the *National Environment Protection (Assessment of Site Contamination) Measure 1999* (April 2013), NEPC 2013, Canberra.

Figure 1: SP1 Head of Gully, EW140641-1

Figure 2: SP2 Topside stockpile EW140641-2

Figure 3: SP3 Below Stockpile EW140641-3

Figure 4: SP4 Below Dam, EW140641-4

Figure 5:SP5Crest Hill Mid Pdk, EW140641-5

Figure 5: Mud Map of Sample Collection (Approximate)

The basis on which I selected information from the enclosed Envirolab Data for the results summary was to identify those contaminants that recorded a measurement above the lowest obtainable reading (LOR or limit of detection). Levels that measure below the instrument's level of detection are typically below guideline limits for contaminants. I reviewed the quality control data and I did not incorporate the contained information into the summary as there were no anomalies that needed to be highlighted.

Table 2: Results Summary

ANALYTE	Units	SP1 140641-1	SP 2 140641-2	SP 3 140641-3	SP 4 140641-4	SP 5 140641-5	DECC Guidelines NEPM Standard Residential	DECC Guidelines NEPM Limited Residential	DECC Guidelines NEPM Schedule B Industrial
Arsenic	*Mg/kg*	<4	<4	<4	<4	<4	***<100***	***<500***	***<3000***
Cadmium	*mg/kg*	<0.4	<0.4	<0.4	<0.4	<0.4	***<20***	***<150***	***<900***
Chromium	*mg/kg*	17	19	18	23	14	***<100***	***<500***	***<3600***
Copper	*mg/kg*	11	14	22	13	7	***<6000***	***<30000***	***<240000***
Lead	*mg/kg*	10	12	14	12	11	***<300***	***<1200***	***<1500***
Mercury	*mg/kg*	<0.1	<0.1	<0.1	<0.1	<0.1	***<40***	***<120***	***<730***
Nickel	*mg/kg*	19	21	23	20	12	***<400***	***<1200***	***<6000***
Zinc	*mg/kg*	36	51	50	35	32	***<7400***	***<60000***	***<400000***
TRH C6-C10 Fraction	*mg/kg*	<25	<25	<25	<25	<25	***<45***	-	-
TRH >C10-C16 Fraction	*mg/kg*	<50	<50	<50	<50	<50	***<110***	-	-
TRH >C16-C34 Fraction	*mg/kg*	<100	120	350	<100	<100	***<300 coarse <1300 fine***	-	***<1700 coarse <2500 fine***
TRH >C34-C40 Fraction	*mg/kg*	<100	<100	110	<100	<100	***<2800 coarse <5600 fine***	-	***<3300 coarse <6600 fine***
Benzene	*mg/kg*	<0.2	<0.2	<0.2	<0.2	<0.2	***<0.5***	-	-
Toluene	*mg/kg*	<0.5	<0.5	<0.5	<0.5	<0.5	***<160***	-	-
Ethylbenzene	*mg/kg*	<1	<1	<1	<1	<1	***<55***	-	-
Xylene (o, m & p)	*mg/kg*	<2	<2	<2	<2	<2	***<40***	-	-
Naphthalene	*mg/kg*	<1	<1	<1	<1	<1	***<3***	-	-

Standard Residential: *is residential with garden/accessible soil (home grown produce contributing less than 10% of vegetable and fruit intake: no poultry); this category includes children's daycare centres, kindergartens, preschools and primary schools.*
Limited Residential: *where there are minimal opportunities for soil access: includes dwellings with fully and permanently paved yard space such as high-rise apartments and flats. This classification does not include public parks and gardens or residential with substantial vegetable gardens and poultry.*
Industrial/Commercial*: includes premises such as shops and offices as well as factories and industrial sites*

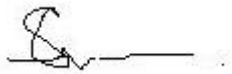
Overall Impressions:

All five (5) top soils collected from the site at Melville Haul Road, Gunnedah were below the threshold values for contaminated sites (for fine materials) for residential use according to the Guidelines.

This report has been prepared for use by the client who has commissioned the works in accordance with the project brief only. This report does not provide a complete assessment of the environmental integrity of the site and is limited by the scope as defined above.

Please feel free to contact me if you have any questions.

Yours faithfully,



Stephanie Cameron.
Laboratory Operations Manager
Independent consultant for agriculture & the environment
(B.App.Sci Biological & Chemical Technologies)

Enc. Envirolab Certificate of Analysis 117092

APPENDIX C – ARCHELOGICAL REPORT

AN ARCHAEOLOGICAL ASSESSMENT/SURVEY OF LOTS 27 AND 28 (DP755474) ADJACENT TO ROBERT GORDON ROAD, SOUTH GUNNEDAH IN NORTH-WESTERN NSW, PREPARED FOR JA EWING SUPERANNUATION FUND OF GUNNEDAH, PREPARED BY PATRICK GAYNOR, DATED MAY 2021

Stewart Surveys Pty Ltd
ABN 65 002 886 508

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Gunnedah NSW 2380

T 02 6742 2966
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cstewart@stewartsurveys.com

AN ARCHAEOLOGICAL ASSESSMENT/SURVEY OF LOTS 27 AND 28 (DP 755474) ADJACENT TO ROBERT GORDON ROAD SOUTH OF GUNNEDAH IN NORTH-WESTERN NSW

A REPORT PREPARED FOR THE JA EWING SUPERANNUATION FUND OF GUNNEDAH

BY
PATRICK GAYNOR
PO BOX 814
GUNNEDAH NSW 2380
PH 0408 465 075

MAY 2021

Summary

An archaeological assessment/survey of Lots 27 and 28 DP755474 in the Shire of Gunnedah was under taken on the 27th May 2021 in preparation for a subdivision development application for rural housing at the request of Mr. Jarad Ewing of Gunnedah. Lots 27 and 28 are situated on the west side of Robert Gordon Road, which runs south off Bushs Lane. Lot 27 has frontage to Bushs Lane on the north side. The assessment area falls within the area designated by Tindale (1974) as belonging to the Gamilaroi tribal or dialectical group and is within the Land Council Zone of the Red Chief Local Aboriginal Land Council, based in Gunnedah. Mr David Horton and Mr. Jack Coglan represented the Land Council on the survey and discussed the survey strategy and results on completion and the recommendations with me. Mr. Tim Gaynor was my archaeological assistant for the day.

The survey was conducted in two parts more or less within each lot parameters. Lot 27 took in the north side of the main watercourse. A crop of Teff occupied about 60% of this side of the watercourse. The crop had very limited visibility beneath it. Visibility along the watercourse and into the western part of the Lot varied from nil to 100%. There were many pebbles in some of the washed out areas in the western section with quartz being the most stand out material. There was however, enough bare ground visibility available to get a good picture of the soil in and out of the crop. All trees present seemed to be too young to have been around in pre-European times, and none bore scars. A farm track ran up the north side of the watercourse and around the western, northern and eastern fence lines, which generally had good bare ground visibility. Map 3 on Page 8 shows the area in crop that was only sampled in sections. All areas outside of that were surveyed but no stone artefacts were sighted. Visibility would have averaged about 20% in this section.

Lot 28 took in most of the central watercourse which had varied visibility throughout ranging from 0-100%. A farm track ran around the south side of the watercourse and inside the boundary fence on the west, south and east sides. This track had generally good visibility. Three artefacts were discovered just off this track. The first was 87 metres west from the entrance gate off Robert Gordon Road, and the other two close together on an ants nest just off the track a further 62 metres west. As it was only 62 metres between the artefacts it was decided to call it one site (Marshmead 4) with an area of 62x5 metres to be excluded from earthmoving along the watercourse. A large area in the west was not sown to crop and many summer plants were growing on it but with bare patches in between. A large dump of earth spoil was in the SE corner, which is to be spread on some on the washed out areas in the west of Lot 27. The crop of Teff was sampled around the edges in all areas and across a levy bank to a pine tree in the lower Northeastern area. No further stone artefacts were sighted. Visibility would have averaged about 15% in this part of the survey. Map 3 shows the area surveyed and the crop part that was only sampled. Effective coverage for the combined 60.5 ha of the survey (as required by the Heritage Department) was 10.5% (see table 4.1 on page 19).

After consultation with David Horton and Jack Coglan, it is recommended that an area of 62x5 metres towards the watercourse from a line joining the two ends of the site be excluded from any earthmoving and star posts be put around the artefacts at each end of the site with appropriate wire joining the posts in each area. Wire should be put around the posts in the 2011 Marshmead 3 site as well. An area of 15 metres around the 2011 Marshmead 3 site should be excluded from disturbance such as house roadways or gardens. Otherwise there is no impediments to the subdivision going ahead with the provision always of, if in the course of road construction or drainage control, any Aboriginal artefacts are uncovered, the Red Chief Local Aboriginal Land Council and the Heritage Department at Dubbo be notified. They will then in consultation, decide on what course of action is to be taken.

It is of interest that both the AMG and the Latitude and Longitude readings taken at the ants nest part of the site on two different recording platforms on the day were later plotted on the topographic map and it was found that they were both very wrong and placed the site in Lot 27 hundreds of metres from the actual spot and so these were disregarded. However, both readings for the bottom part of the site 62 metres to the east correlated and the AMG readings will be the ones used in the recording of the site for the AHIMS register as 233540E, 6565352N as this is the required format.

CONTENTS

List of Maps

List of Tables

1 Introduction

An archaeological assessment/survey of Lots 27 and 28 DP755474 fronting the west side of Robert Gordon Road in the Shire of Gunnedah was under taken on the 27th May 2021 in preparation for a subdivision development application for rural type housing at the request of Jarad Ewing on behalf of the JA Ewing Superannuation Fund of Gunnedah. Stewart Surveys had previously carried out searches of the AHIMS register for Lots 27 and 28 in December 2020 for Jarad (see results in Appendix 3). That search by Stewart Surveys with a zero metre buffer revealed 1 site on Lot 27. (see Appendix 2 on page 41). There was some controversy about this site by the Dept. Environment and Heritage staff of Dubbo at the time as it was conveniently found on an ants nest after a survey on the neighbouring property had been completed. Nevertheless, under instructions from DEH, it was recorded as a site. For a full description of this site and a later survey of Robert Gordon Road see the 2011a (Annexure to an archaeological survey of Lots 23,24,25 and 26 DP 755474 on the Wandobah Road near Gunnedah in NW NSW).

1.1 Background to the Survey

The survey area falls within the area designated by Tindale (1974) as belonging to the Gamilaroi tribal or dialectical group and is within the Land Council Zone of the Red Chief Local Aboriginal Land Council, based in Gunnedah. According to a survey in 2002, the Gunnedah area has an abundant of scarred trees in the travelling stock reserves (TSR) between Gunnedah and Boggabri, but other types of Aboriginal relics are not so plentiful. This survey of public lands was part of the 2002 Aboriginal Cultural Heritage Assessment of the Brigalow Belt South for the Resource and Conservation Assessment Council (RCAC) of the NSW Government.

1.2 The Location of the Survey Area and Lot

The survey area is located on Robert Gordon Road which runs south of Bushs Lane which in turn runs west off the Wandobah Road about 6 km south of the Gunnedah Post Office in northwest NSW. The proposed development sites comprise Lots 27 and 28 DP755474 totaling 60.5 ha. (see Maps 1, 2, and 3 on pages 6, 7, and 8).

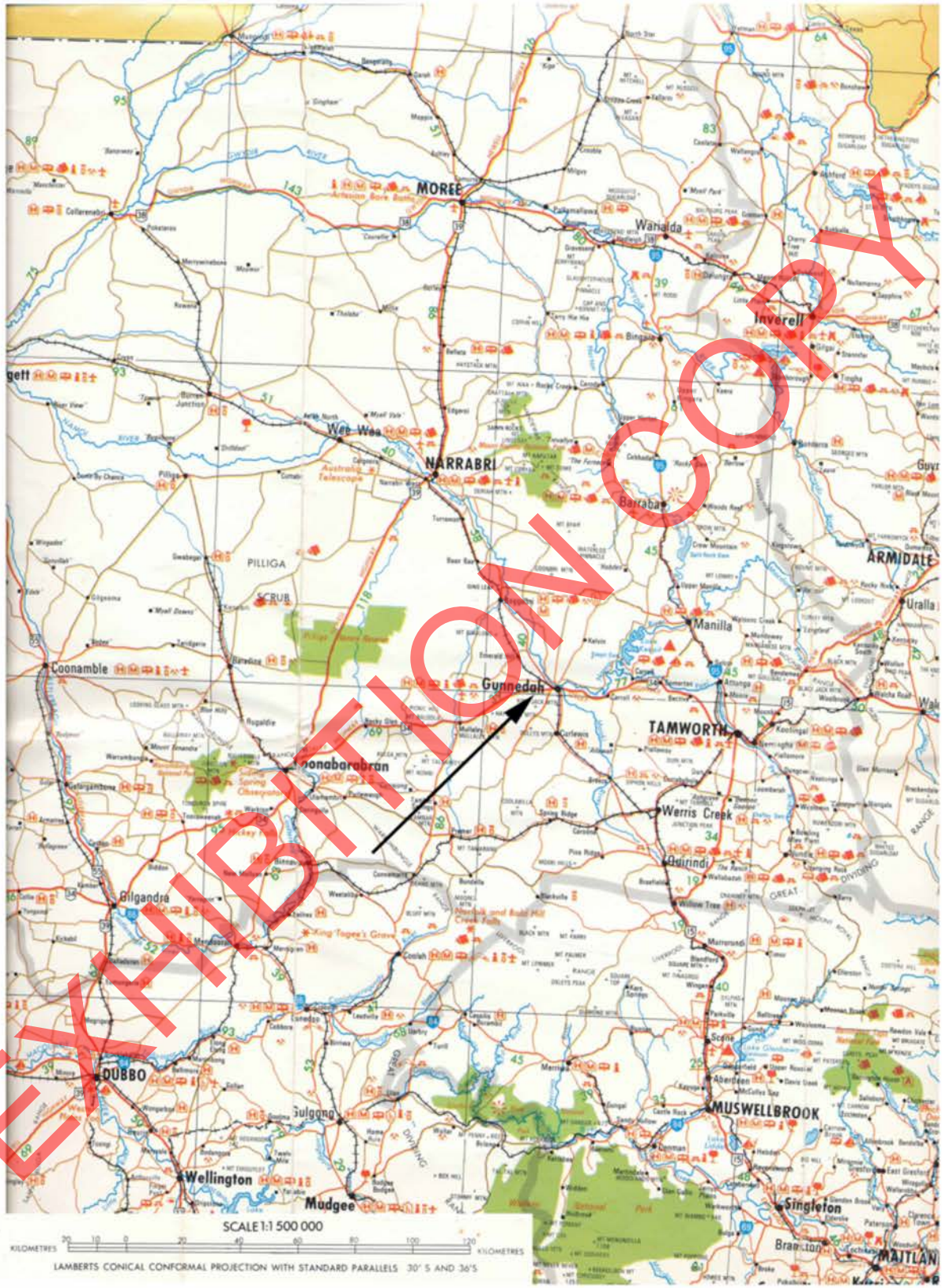
1.3 The Archaeological Brief

The brief for the survey from Mr. Jarad Ewing representing the developers, was to conduct an archaeological survey of Lots 27 and 28 facing Robert Gordon road. The survey was to be undertaken in association with representatives of the Red Chief Local Aboriginal Land Council.

1.4 Aboriginal Consultation

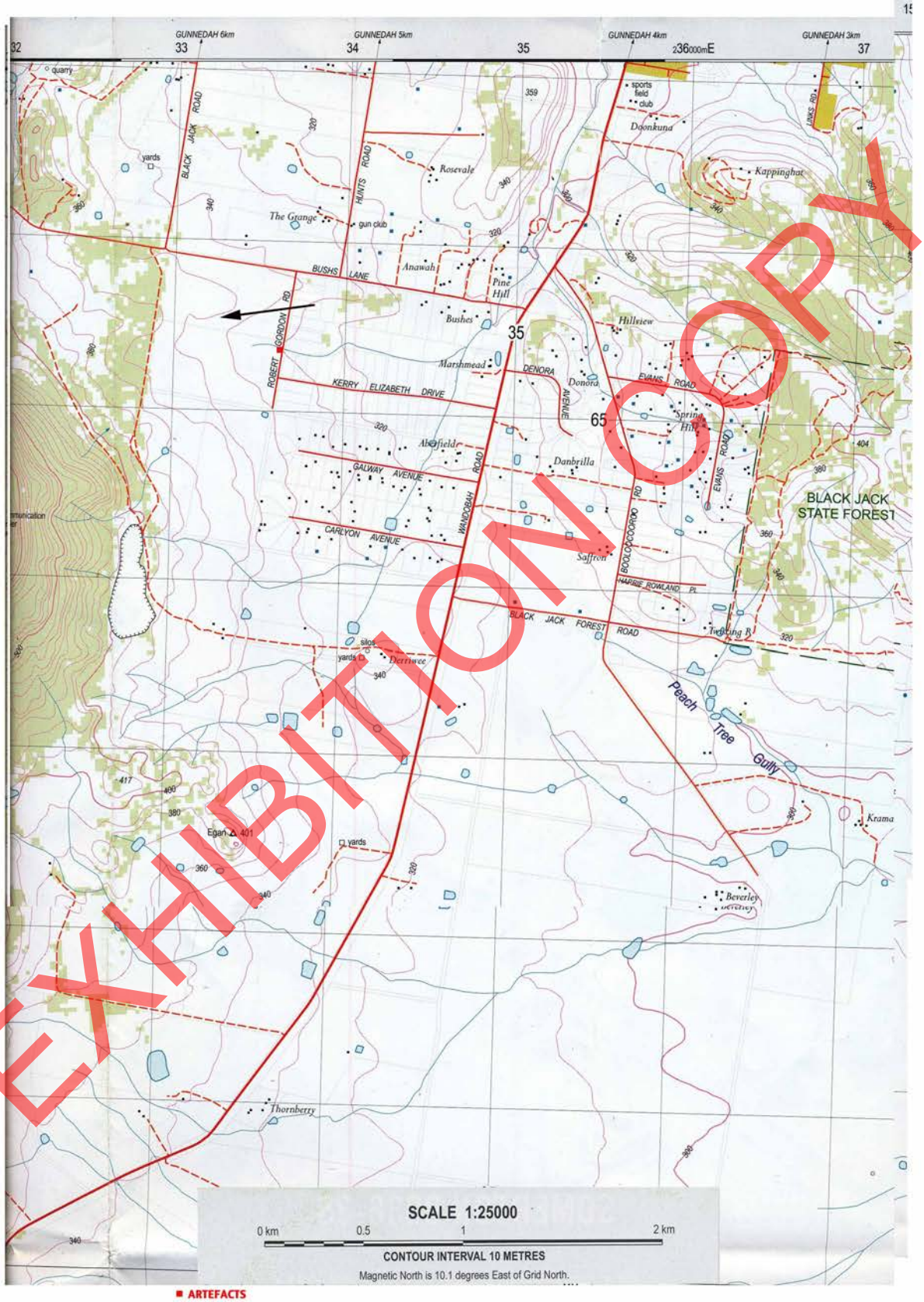
Contact was made the Red Chief Local Aboriginal Land Council office staff prior to the survey. They made arrangements for Mr. David Horton and Mr. Jack Conlan to represent the Red Chief Local Aboriginal Land Council on the survey. Before starting the survey we discussed the method to do the survey and also after the survey, the results obtained and their recommendations.

MAP 1
LOCATION OF GUNNEDAH



ADAPTED FROM A TOURING MAP OF NSW

MAP 2
GENERAL SURVEY AREA



■ ARTEFACTS

ADAPTED FROM THE WONDOBA 1:25000 TOPOGRAPHIC MAP

MAP 3
SATELLITE MAP OF SURVEY AREA
SHOWING SURVEYED AND CROP AREAS

ROBERT GORDON ROAD SECTION IS APPROX. 807.5 METRES LONG
THE BUSHS LANE SECTION IS APPROX. 750 METRES LONG

1.5 Historical Background

This area east of Blackjack Mountain is old farming country and about 70% of it is presently under a horse hay crop of Teff. It is situated just west of a previous rural development now situated of both sides of Kerry Elizabeth Drive. A 2011 interview conducted with Mr Malcolm Robinson, the former owner of Marshmead, was instrumental in an old aerial map of the property being produced on the day of the survey. This photo showed that most of the paddocks were then under cultivation. Mr. Robinson was unsure of the date of the map but he stated that the last crop grown on the property had been in 1984. Since then, that property has been a grazing enterprise. He said the property had been in the family for about 100 years. Mr Ewing thought that these two Lots although not part of Marshmead were owned by other members of the Robinson family but he was unaware of the property name but what was historically true for Marshmead would probably apply to these two Lots as well. On the basis of that, Lots 27 and 28 have all been cultivated in the past and probably up to 100 years.

2 The Environmental Context

2.1. Topography

Lots 27 and 28 are situated side by side and slope from the west to the east. There is only one drainage line in Lots 27 and 28 which is near their boundary in the centrre of the proposed development and according to the satellite map (see page 8) it runs right through the property and into the subdivision on the east side of Robert Gordon Road. Lots 27 and 28 join the timbered bottom slopes of Blackjack Mountain on their western boundaries. The south side of Lot 28 joins a surveyed unformed lane running alongside it all the way to the western boundary towards Blackjack Mountain (according to the 2014 edition of the Wondoba Topographic map). An large heap of soil is stockpiled in the southeast corner of Lot 28 which is scheduled to be used for top dressing the badly scoured areas towards the northwest part of Lot 27. Contours 340 and 350 metres ASL run through both Lots with the lowest parts being near both ends of Robert Gordon Road (see the 2014 edition of the Wondoba Topographic map) .

2.2 Geology and Soils

According to the Tamworth 1:250,000 Geological Sheet, the survey site is situated on the Blackjack Formation of sandstone, shale, conglomerate, chert, coal, and limestone. It is also west of the Porcupine Formation of lithic sandstone, conglomerate, shale and limestone (Tamworth 1:250000 Geological Series Sheet SH 56-13). Both the Blackjack and the Porcupine Formations are Upper Permian in age, which is 248 to 258 million years ago (Harland et al in Chorley, Schumm and Sugden 1984:607).

According to my observations on the survey day, the soil is red in colour along Robert Gordon Road and throughout the property and is prone to erosion according to what was seen on the survey. On that day, there were many pebbles of quartz scattered outside the cropped areas but none appeared to have been modified except by cultivation implements. On occasions small pebbles of black chert, bits of petrified wood and a few rocks of quartzite were sighted along with some fossil plants in sandstone towards the top of Lot 27 which was badly scoured out. The slopes further south on Blackjack mountain were well known by rock collectors in the past as having pink petrified wood scattered about the paddocks.There was also a few rocks of black basalt encountered during the survey. I was told many years ago by former miners of Blackjack mine that many times there was as much basalt as coal being mined in batches as basalt had dykes running through the coal in some areas. These and other rocks and pebbles probably had been washing down from the Blackjack mountain over many millions of years. There were no slabs of any type of rocks encounted even in the deeply rutted parts of the central water channel which was probably only a broad grassed waterway before the area was farmed. It may have had a few waterholes in the past which would have utilised by the Aboriginal people in the area.

2.3 Vegetation

Species identification for this report was undertaken with the assistance of the following references: Plants of Western New South Wales by Cunningham et al:1981, A Field Guide to Weeds by Lamp & Collet and the internet. Plants observed and identified during the survey were:

TABLE 2.1 - LIST OF PLANTS OBSERVED

White Box (*Eucalyptus albens*)	Eastern Cotton Bush (*Maireana microplylla*)
Galvanized burr (*Sslerorolaena birchii)*	Spear grass (*Stipa sp.*)
Cypress Pine (*Callitris columellaris*)	Saffron Thistle (*Carthamus lanatus*)
Wilga (*Geijera parviflora*)	African Boxthorn (*Lycium ferocissimum*)
Pepper tree (*Schinus areira*)	Mexican poppy *(Argemone mexicana)*
Noogoora burr (*Xanthium occidentale)*	Olive tree (*Oleo europaea)*
Cape weed *(Arctotheca calendula)*	False castor oil (*Fatsia japonica)*
Wallaby grass (*Austrodanthonia caespitose)*	Prickly pear (*Opuntia stricta*)
Umbrella Grass (*Chloris truncate)*	Teff (*Eragrostis tef)*
Variagated thistle *(Silybum marianum)*	Wattle (*Acacia sp.*) several species
Charleys weed (known locally) no scientific name found	Wallaby grass (*Austrodanthonia caespitose)*
Sunflower (Helianthus annuus)	Sow thistle (*Sonchus oleraceus)*
Marshmallow (*Althaea officinalis)*	Lambs tongue (Plantago lanceolata)
Cobblers peg (*Bidens pilosa)*	Wild mustard or turnip (*Sinapis arvensis)*
Bathurst burr (*Xanthium spinosum)*	Queen ann's lace (*Daucus carota)*
Bimble box (*Eucalyptus populnea)*	Crowsfoot *(Diphasiastrum digitatum)*

There were other plants growing on the property that I was unable to identify but this selection gives a general idea of the variety of plants encountered. Teff was the annual crop growing on about 70% of the survey area. The other plants listed were generally growing outside the cropping area that had Teff on it.

2.4 Fauna

These animals or signs of their presence were seen during the survey – Grey kangaroos, Koala, Wallaby, dog, (tracks) or scats (possibly wombat) plus ducks on a dam, green parrots, chicken hawk.

3 Previous Archaeological Research

3.1 Recorded sites

An AHIMS search by Stewart Surveys in December 2020 of the two lots without a buffer revealed there was one registered Aboriginal site on the Lot 27 which was recorded by the author in 2011. This was right next to Robert Gordon Road about 250 metres east of Bushs Lane.

According to a search done in 2011 for the Mashmead survey there are a number of registered grinding grooves north of Bushs Lane adjacant to Wandobah Road. These are as follows:

Site No.	Site name	Map Co-ordinates	Site Type
29-1-0100	Wandobah 3	56234950E, 6565608N	Grinding groove
29-1-0102	Wandobah 5	56234950E, 6565602N	Grinding groove
29-1-0099	Wandobah 2	56235007E, 6565704N	Grinding groove
29-1-0106	restriction applied		Open Site
29-1-0105	restriction applied		Open Site
29-1-0110	restriction applied		Open Site
29-1-0103	Wandobah 6	56235006E, 6565608N	Grinding groove
29-1-0098	Wandobah 1	562350167E, 6565704N	Grinding groove
29-1-0104	restriction applied		Open Site
29-1-0101	Wandobah 4	56234950E, 6565602N	Grinding groove
29-1-0052	Blackjack Complex	56234900E, 6565485N	Artefact, Grinding groove

NOTE: It appears that every grinding groove was registered as a site although, according to the AMG readings, they appear to be next to each other and could have been registered as one site. It would also appear that the site registered as the Blackjack Complex could be also part of the same site.

All these grinding groove sites appear to be in Blackjack Creek, just north off Bushs Lane and about 1500 metres east of Lot 27 and would be situated on the lithic sandstone of the Porcupine Formation, which according to the Blackjack Formation Geological sheet does not occur in the surveyed area. About that time, I contacted the recorder of the sites with the restrictions on as to the reason for the restrictions but he said he had not recommended any restrictions and had no idea who put them on. Because of that we do not know what type of site or sites they are.

3.2 Previous Surveys

Some general background

A number of sites were recorded in 2002 as part of the Aboriginal Cultural Heritage Assessment for the Brigalow Belt South Report (see Gaynor 2002 and Purcell 2002). At the time of a survey just west of Gunnedah for an Ethanol Plant, some consultancy reports were found at DECCW Dubbo in connection with proposed Coal Mine developments in the Boggabri area (Boggabri is 40 km north-west of Gunnedah). The two reports were from Hamm and Appleton. A search of reports held by the Red Chief LALC at Gunnedah at the same time was successful in finding a number of the older reports (pre-2000), which were of more value than the Boggabri reports.

Older surveys

Haglund 1984a

Haglund was able to locate three Aboriginal sites in surveying a haul road for the Vickery Joint Coal Venture in 1984. The sites were all associated with the Namoi River. A scatter of stone artefacts and a scarred tree were located on a high terrace above flood level on the Namoi River (this is the site recorded as 20-4-0036 - Namoi river/CWR). The other site located was also a scatter of stone artefacts at a nearby lagoon, but this seems to have been missed in the AHIMS register while the other artefact scatter and scarred tree have been recorded three times.

Haglund 1984b

Haglund surveyed a second haul road from Trunk Road 72 (now the Kamilaroi Highway) to the load loader on the northwest railway line and the area to be impacted by the coal loader and stockpiling of coal for the Vickery Joint Coal

Venture in 1984. No sites were located in the survey for the haul road. The coal loader is approximately 8 km northwest of this survey area.

Haglund 1985

Haglund excavated one previously recorded Aboriginal site and one potential site near the Namoi River as part of the investigation of areas associated with the Victory Joint Coal Mining Venture. The excavation of the potential site was unsuccessful in locating stone artefacts. The excavation of the existing site recovered a few artefacts from the surface and subsurface areas but these according to Haglund, were of poor quality (they were mostly fragmented) and any analysis that was attempted, was not of much value.

Appleton 1999

Appleton carried out a survey of an area of 763 ha that was going to be impacted upon by the Whitehaven open cut coal mine which is situated about 25 km north-west of Gunnedah. Appleton located three sites. He found 15 stone artefacts in an area of 25 by 15 metres that he suggested was a knapping floor as all the artefacts were of one raw material. He described these artefacts as pale cherty artefacts. Number two site was an isolated 'cherty mudstone' stone artefact. Number three site was a scarred grey box tree who's scar reached to the ground which he suggested raised some doubts as to its Aboriginal origin although the top of the scar looked like a typical Aboriginal type (Appleton's photo suggested that it was probably of Aboriginal origin - personal opinion).

Later Surveys

Gaynor 2002.

Gaynor in company with Red Chief Local Aboriginal Land Council Representatives Mr. Les Fields and Mr. Wayne Martin carried out surveys in the Red Chief Local Aboriginal Land Council area as part of the Aboriginal Cultural Heritage Assessment of the NSW Western Regional Assessments Brigalow Belt South Bioregion (Stage 2). This assessment looked at available areas that were types of landforms that were expected to be connected with Aboriginal Cultural Heritage (Purcell 2002:8). This survey found numerous scarred trees in Travelling Stock Reserves between Gunnedah and Boggabri. These stock reserves all had access to the Namoi River. Several of these scarred trees were located in a TSR about 8 km northwest of this survey area. These scarred trees were recorded as '4 Mile' TSR (west side) or (east side) scarred trees. The haul road from the Vickery coal mine had effectively cut this reserve into two parts and so now there is an east and west section. Seven scarred trees were recorded on the eastern section and two in the western section. All scars were all located on White Box trees.

This nine day survey with the Red Chief LALC representatives in 2002, covered State Forests, TSRs, and roadways. In all, 88 sites were located that consisted of 15 stone artefact scatters (all associated with well defined watercourses), 2 isolated stone artefacts and 71 scarred trees (these were mostly White Box trees but a few were River Red Gums). All stone artefacts were located in State Forests and none in TSRs or flood plain country. Raw materials of stone artefacts noted in the Red Chief LALC territory survey were quartz, quartzite, chert, jasper, chalcedony and petrified wood. The few grindstones found were all sandstone based.

Probably the closest stone artefact scatter recorded in 2002 to the survey area was in the Goran State Forest which about 18 km to the south of this survey area. It was found around a large broad gully than runs south towards Goran Lake. The

artefact materials noted were quartz, quartzite and chert. The site measured 42 by 4 metres along one bank of the gully. Two scarred trees were also sighted about 500 metres to the south of this site. A number of scarred trees were also sighted on the north side of the Namoi River adjacent to Gunnedah. All were within 1 km of the Namoi River and about 8 km north of this survey area.

Gaynor 2004.

Experiments, carried out by Gaynor over a three year period (using 200 specially home made stone artefacts of various sizes and raw materials and farming implements commonly used after tractors were introduced in the 1920/30s) have special significance for this survey. Gaynor's results revealed that stone artefacts were dispersed between 2.2 and 26.8 metres in distance and a spread of up to 4 metres in width from the original one metre position, at the end of the three years of normal broadacre cultivation using the common circular method of cultivation. Size of artefacts had little to do with the distance travelled in some cases, as it was observed that some artefacts became encased in large clods of dirt and were then moved by the cultivating implement as if they were a large artefact. As the two paddocks in this survey area have been cultivated in the past, it would be expected that any artefacts found in that area would not be in their original position. If we use the figures obtain by Gaynor to estimate the spread over 30 years after cultivation of farming, then artefacts would be spread from 268 to 22 metres from their original position if the traditional circular way of cultivation was carried out. This results from this experiment suggests that any artefact found in the survey area that had been cultivated in the past would not be in-situ.

Appleton 2007

An archaeological survey of Lot 2 DP 848920 was undertaken by John Appleton of Archaeological Surveys & Reports Pty Ltd in 2007. This area is on the south side of Gunnedah Township and was on old farming land which was being subdivided for housing blocks. It was all sloping land running up to ridges in the south with a large gully running through the centre. After an extensive search, no Aboriginal artefacts were located. It was about 3 km southwest of this survey. The majority of stones sighted were sandstone.

Umwelt Pty Ltd 2008

In 2005 and 2006, Gaynor under contract to Umwelt, carried out two surveys near the Gunnedah Shire Waste Management Facility on the Quia Road west of Gunnedah. These were in connection with areas that Primary Energy Pty Ltd had wanted to build an Ethanol Plant on. The first area of 11.78 ha was 5.5 km west of town was later deemed unsuitable for logistic reasons but no artefacts were found in this survey. The second area of 39 ha was 7.10 km west of the town but the first survey and second survey areas were all part of the 410 acre old farm of Barramilga and was on the western side of the Waste Management Facility. These areas were old farming land according to former owners and neighbours. No Aboriginal artefacts were sighted in this survey either. These areas are about 2 km south of the Namoi River. They are about 7 km northeast of this survey area.

Gaynor 2011a

A survey of the property 'Marshmead' on the Wandobah Road near Gunnedah was carried out in January 2011 in preparation for a rural subdivision. All the land sloped towards the east and Blackjack Creek. The survey was carried out in four sections or units corresponding to paddock size combinations. All paddocks had been extensively cultivated in the past, according to a previous owner. A portion of the south paddock (the largest) was surveyed with a vehicle and

sampled at intervals but all the other paddocks were surveyed on foot. Visibility was a problem in most paddocks but there were bare areas in all paddocks that had excellent visibility. Effective coverage was 4% while visibility ranged from zero to 100%. No outcrops of lithic sandstone were sighted. Only one stone artefact was found. This was a large mudstone retouched blade-like flake. It would not have been in situ as the area where it was found was in the middle of a former cultivation paddock. Investigations of the local raw material revealed that it was not a local raw material. No other Aboriginal artefacts were sighted in the survey. This area joins Lots 27 and 28 on the east side of the survey area. A search requested by Mr. Jarad Ewing for this artefact and its location by the author in 2017 failed to find any trace of it although an hour was spent looking for it.

Gaynor 2011b

This survey became necessary following the reported findings and destruction of stone artefacts sites adjacent to Robert Gordon Road by Mr. Ron Long and associates of Gunnedah after the survey of Marshmead was completed. Mr. Paul Houston of the Department of Environment and Heritage of Dubbo was then sent to investigate. The author met with Mr. Houston on site but no artefacts could be sighted on the half-constructed road. Mr. Houston then contacted Mr. Long and he arrived with one other person but they failed to produce any evidence of stone artefacts on the road. However, after much searching 2 small artefacts were discovered on the edge of a large gully and several more on an ant's nest off the opposite side of the road on the adjacent property well off the road. Mr Houston was dubious about the artefacts being originally there but said the sites had to be recorded and another survey done of the road in conjunction with members of the Red Chief LALC and Gunida Gunyah. This was carried with an invitation for Mr. Long to take part but he declined and sent a young Mr Draper who because he failed to produce evidence of personal insurance, and so did not take part in the survey. A full survey of the road was carried out but no artefacts found. The ant's nest site is on Lot 27 of this present survey.

Gaynor 2011c

Gaynor under contact to the DPI and in association with members of the Red Chief LALC and Gunida Gunyah Inc. recorded two artefact scatters, one set of grinding grooves and one scarred tree on the east end of the Broadwater part of the Namoi River off the Bluevale Road and opposite the Gulligal Lagoon TSR on the south side of the river. The scatters were registered as Broadwater 1 and 2. Cherts of various colours were the dominant stone material, but basalt, petrified wood, jasper, chalcedony and quartz were also present. These scatters were large and were probably just one big site but the lack of visibility prevented this from being verified. One scatter measured 100 by 17 metres while the other was 56 by 10 metres. The scatters were 150 metres apart.

The grinding grooves were on the edge of the river in an area of 180 by 80 cm. There were 18 grinding grooves observed, with the largest being 49 mm long and the shortest 20 mm. It appeared they were all been used for axe grinding. There may have been more present under the water, as the water was not clear enough to determine this. We were not able to determine the rock's raw material, but it did not appear to be sandstone. A later inspection of the area in 2012 determined there was at least one grinding groove below the water level. The whole area is bounded by coarse conglomerate (which may have been a stone source for making stone artefacts). The smoother area with the grinding grooves on it was below the conglomerate section of the outcrop. The scarred tree recorded as Broadwater ST1 was dead and its species was not able to be determined. The tree and scar, however, have survived floods in the past and the tree is

in no danger of falling down. It is about 10 metres from the water's edge. The scar is shield shaped and measured 740 by 25 cm. This whole area is about 23 km to the northwest of the survey area.

Gaynor 2012a
A survey of an unformed section of Mathias Road, two kilometres west of the Gunnedah saleyards was carried out in March 2012. A preliminary search of the general area revealed two large Bimble Box trees with shield type scars on them. These two trees were within 700 metres of the Namoi River and both were situated off the line of the road. Both were recorded for the AHIMS register. This area is about 3.5 km north of the survey area. The survey did not discover any further scarred trees or any stone artefacts. The land was prone to flooding and was very wet in a few lower areas at the time of the survey in May 2012. Note this road was incorrectly called Torrens road in the survey report but should have been Mathias Road. The scarred trees are registered as Torrens Road Scarred Trees 1 and 2 in the AHIMS register but they have the right AMG locations in the registration and so can easily be found but not on Torrens Road.

Gaynor 2012b
A survey of a proposed extension to an existing blue metal quarry on Melville Hill between Marys Mount and Mullaley in the Gunnedah District was carried in 2012. The whole surface area was covered in small to medium sized fractured basalt. Ground visibility ranged from zero to 100% with effective visibility being calculated at 8% overall. No sign of any pre-mechanical quarrying was observed and no stone artefacts of any material were found. One White Box tree with an elongated scar measuring 2.25 metres in length and thought to be of Aboriginal origin was discovered on the lower northern slope. This tree was situated very close to a fence running east west and was north of the present quarry. It was deemed to be outside the actual northern boundary of the proposed expansion. Melville Hill is about 18 km west of this survey area

Gaynor 2013
An archaeological survey of a proposed rural subdivision on the property 'Lillydale' on Hunts Road near Gunnedah (being Lot 323, DP 755503, Parish of Gunnedah, County of Pottenger) was undertaken on the 5th of July 2013 at the request of W. Hinton and J Minahan of Gunnedah, NSW. Perusal of the result obtained from the AHIMS search for registered Aboriginal relics, the geology of the area and some previous archaeological surveys suggested that it was unlikely that stone artefacts, art, grinding grooves, hearths or axes would be present, but there was a slight possibility that scarred trees and grinding grooves could be present.

The survey was carried out in two sections corresponding to the two major paddocks on the property. There was an abundance of rounded pebbles on the surface and also below the surface as indicated on the banks of the two dams and some contour banks that were encountered. There was also an occasional bench of solid rock on the surface. Ground visibility ranged from zero to 100% with effective visibility being calculated at 19% overall. No stone artefacts of any material were found. Nearly all trees encountered appeared to have grown since the property was initially cleared as only a couple of large old trees were sighted in the survey. None of these trees bore scars of any description. There were no watercourses noted in the property. This county is very unlike the present survey area as stone sources being basically sandstone based. No Aboriginal artefacts were located. It is about 3.25 km north of the present survey area.

Gaynor 2019
An archaeological survey of Stages 5 and 6 of the Gallen Estate in Lot 1, DP 848920 on Lincoln road

Gunnedah was carried out to ascertain if any stone artefacts had appeared in this subdivision following the initial survey by Appleton in 2007 in which none had been sighted. This survey was a much smaller area than the original survey but as before no artefacts were sighted even though there was very little ground cover owing to the prevailing drought. This was sandstone country much like that encountered in the 2013 survey on Hunts Road.

Gaynor 2020

This survey of an area of two Lots off Torrens Road near Gunnedah, was undertaken on the property Costalot by the author in company with Ms.Tracy Wortley of the Red Chief LALC. This area is very flat and could be described as floodplain country. A search of the AHIMS register for Aboriginal relics of the area returned a nil result for Lots 1 and 2. The closest recorded scarred trees were adjacent to Mathias Road about 200 metres to the north of these Lots. The nearest recorded stone artefacts were found in 1984 by Haglund near the Namoi River about 3.5 km north of this survey area.

The survey of the two Lots, which collectively added up to 28272 square metres revealed that many areas of Lot 1 contained buildings and had other areas top-dressed with a fine blackish gravel. There were however, areas on the eastern side of the Lot that had bare ground, which gave a good indication of soil type and associated stones. Towards the south of this Lot were a number of mature trees that were inspected for scars but none were present. No stone artefacts were sighted in this Lot.

Lot 2 was more open but contained a 20 metre heavily grassed area on the western boundary. There was also a large area in the centre that was top-dressed with the same material as in Lot 1. It did however; contain a wide area of reasonably bare ground on the east side, as was the case in Lot 1. Local stone seen here but it was totally unsuitable for making stone artefacts or for use as a grindstone. No stone artefacts were sighted. This survey results supports data obtained from other surveys around Gunnedah and that is that stone artefacts are seldom seen on country situated away from the river. It also points to the fact that scarred trees, although sometimes seen up to 1 km away from a river or stream, are usually found much closer to the river as is the case in the many Travelling Stock Reserves (TSRs) between Gunnedah and Boggabri.

3.3 The Predictive Model

A knowledge of the local geology, the previous archaeology carried out around Gunnedah and adjacent areas, and the listing from the Aboriginal Heritage Information Management System (AHIMS), allows some predictions to be made in relation to the type of Aboriginal relics that may be encountered at the survey area. It could be reasonably expected that:

1) According to the other surveys conducted in the Gunnedah area, the raw materials used by Aboriginal people in this area for stone tool production were be based on quartz, chert, petrified wood, jasper, chalcedony and quartzite, and occasionally mudstone so any stone artefacts found, should be based on any one of these raw materials.
2) According to the satellite map there is one large waterway/gully noted in the survey area which was probably present in Pre-European times. According to previous surveys, if stone artefacts and scarred trees are found, they will be near these waterways. About 70% of the main survey area is under crop at the moment, and being close to Gunnedah was probably cleared and cultivated prior to 1900. Using the data compiled by Gaynor (2004), most artefacts if originally left in this area would now be well scattered and damaged due to this long period of cultivation. But going on the survey of Marshmead in 2011 and the presence of the main waterway, there a chance that stone artefacts will be discovered there but not probably not scarred trees due to widespread clearing in the past.

3) Art sites should not be present as the Tamworth Geological Sheet suggests there are no geological outcrops or shelters in the area suitable for art.

4) The AHIMS register search revealed that grinding groves were present in the Blackjack Creek about 1100 m to the east of this area, so if there is any all lithic sandstone in the waterways then they could be present. Mullers or portions of these top grindstones could be present on the areas where suitable grass seeds may have previously grown. These mullers would most likely be made of sandstone, as sandstone is available in the hills around Gunnedah according to the Tamworth Geological Sheet.

5) Scarred or carved trees would probably not be present as all the land has been cleared and farmed extensively in the past. All older or larger trees will however, will be inspected, be they alive or dead, still standing or fallen.

6) Cooking hearths if originally present, would be destroyed by grazing and/or cultivation.

7) Axe material would probably not be present as axes are now fairly rare around this area south of Gunnedah (personal observations).

4. The Survey Strategy

After discussing the survey area with Mr. David Horton and Mr. Jack Conlan, it was decided to look first at the large watercourse area situated on the edge of both Lots, as it is the experiences of anyone involved in surveying for Aboriginal artefacts, this would be the most likely area where stone artefacts or scarred trees would be found. It was decided to do in the north side first and then return by the south side. As the survey progressed however, it was deemed better to continue surveying the north side of the drainage area after the western end was reached as it contained a large area without crop whereas the south side had more cropping area. So all the north side of the drainage area minus most of the cropping area which was only sampled in parts, was inspected. After circling around Lot 27 back to the drainage area (see Map 3 on page 8), the south side of the drainage area was inspected and the survey continued south around the fenced boundary edges and into the cropping area around the western and southern parameters to return to the watercourse along the east side. In this way all the non cropped areas and some of the areas with the crop were inspected.

4.1 The Survey units

4.2 The North side of the drainage area.

This began just north of the gate to Lot 28 from the Robert Gordon Road situated on the south side of the watercourse. There were areas of heavy grass and weeds, short shrubs, young eucalypt trees and bare patches which gave some indications west of the gate what could be expected in the survey.There were a variety of stones on the ground including quartz and what appeared to be mudstone (see Photos 1, 2 and 3 on page 23). Further west an ants nest was encountered and was inspected for stone artefacts but none were seen. This ants nest was in the centre of a long bare patch with quartz pebbles scattered about but none appeared to have been modified. This long bare patch appeared to be an old farm track up the south side of the cultivation (see Photo 4 on page24). Further west was very overgrown where bare ground visibility was nil and some small deep water washaways were also present. Further towards the west the ground seemed to have been subjected to scouring from water flows that in cases caused deep ruts (see Photo 5 and 6 on page 24).
The survey then continued west where areas also had been subjected to surface wash and many stones were lying on the surface with gullies starting to form (see Photos 7 and 8 on page 25). The white in the stone patches are rounded quartz pebbles which indicates that sometime millions of years ago these were part of a stream. Visibility was excellent here but no stone artefacts were sighted. Photo 9 (on page 25) shows the former level of the soil around some small shubs and how much has been sheet eroded from in front of them. A small dam was encountered near the western boundary with

immature trees growing around it. Visibility was excellent here too but no artefacts were sighted (see photo 10 on page 26).

The survey then veered north as this area was not sown to crop and it was thought would give a fair indication of what was under the crop where visibility was 2 – 0 %. This area had patches of bare ground and others with dead summer vegetation (see photos 11 and 12 on page 26). Several lumps of sandstone were encountered in this area with some containing fossils (see photo 13 on page 27). The colour of the soil was fairly constant being a red colour in the bare patches (see photo 14 on page 27 with Blackjack mountain in the background) which is typical of the area above the crop in Lot 27. Visibility in this area would have averaged about 50% but no stone artefacts were sighted.

The survey then continued east and parallel to Bushs Lane where there was a section of unsown land until about half way down from the NW corner, the crop was sown to the fence. The crop was reasonable thin in patches enabling the ground to be seen clearly. It did not appear any different to the rest of the paddock (see photo 15 on page 27). The survey then continued to the NE corner and turned south towards the main drainage line. A farm track ran along the fence but it was fairly overgrown in sections. Just off this track the Marshmead 3 site recorded in 2011, was encountered and a couple of stone artefacts recorded in 2011 were still visible near the ants nest. The survey of Lot 27 then continued to terminate back where it started at the main watercourse. No new stone artefacts or scarred trees were sighted in Lot 27.

4.3 Unit 2 The south side of the drainage area.

This part of the survey began at the entrance gate to Lot 28 and proceeded west taking in the south side of the watercourse as well as the farm track alongside it and the fringes of the sown Teff crop (see Photo 17 on page 28). At 87 metres from the entrance gate, a chalcedony flake was discovered on the edge of the farm track. Two more stone artefacts were discovered on an ants nest just off the farm track 62 metres west of the first artefact. It was thought that there was a good chance that there may be more artefacts between the two areas, but ground visibility and soil coverage prevented them being sighted, so it was agreed to register this area as one site with a buffer of 5 metres towards the centre of the watercourse. (see photo 18 on page 28 for top end site position and photo 19 on page 29 for all 3 artefacts).

The survey then continued further west where there had been major earthworks constructed to try to divert the water in the watercourse away from the centre to prevent further deepening of the channel. The south side of this was thickly vegetated and had no ground visibility (see photo 20 on page 29). However, visibility in the channel between the formed banks was good in sections (see photo 21 on page 29) but no stone artefacts were sighted. Further west about the earthworks the ground had started to erode and there was much bare ground but no stone artefacts were sighted (see photo 22 on page 30). The survey then encountered a dam constructed near the western boundary. The banks of this were inspected for artefacts but none were sighted (see photo 23 on pagec 30).

The survey then turned south adjacent to the western boundary, the Teff crop had not been sown right to the boundary here and this area was overgrown with summer vegetation (see photo 24 on page 30). In the SW corner was a set of cattle yards also overgrown with summer vegetation as was the whole area above the crop on the western end of lot 28 (see photo 25 on page 31). The survey continued east from the cattle yards along a farm track and the adjacent northern area which was mostly overgrown with marshmallow (see photos 26 and 27 on page 31). The cropping area did return to the fence about half way down the southern bounday (see previous photo). A large bank was encountered in the SE corner which looked like the bank of a dam (see photo 28 on page 32) but when viewed on top it turned out to be a large deposit of spoil that I was told later was earmarked for top spreading on the areas in Lot 27 that are badly scoured out (see photo 29 page 32). The survey then continued along the eastern boundary farm track and into the Teff crop to

terminated at the watercourse (see photo 30 on page 32). A later survey sample of the Teff crop encountered a contour bank which was general clear of vegetation towards the only pine tree in the lower Lot 28 section (see photos 31 and 32 on page 33). This concluded the survey of Lot 28. Before leaving the survey area the author and and his assistant Tim Gaynor revisited the Marchmead 3 site and photographed it (see photo 33 on page 33).

4.4 Effective coverage

The following table as requested by the Dept. Heritage, depicts the approximate area covered in each section and the average visibility together with the effective coverage.

TABLE 4.1 EFFECTIVE COVERAGE

survey no.	av.length in m	av.width in m	total area	coverage (%)	area covered	average visibility	effective coverage	locality
Lot 27	403	750	302250	60	181350	20	36270	Lot 27
Lot 28	404.5	750	303375	60	182025	15	27304	Lot 28
TOTAL			605625 (sq. metres)	60	363375		63574	**10.5% effective coverage**

5.Results of the Survey

Three stone artefacts were found within 62 metres of each other on the south side of the lower part of the main watercourse on the property. This was the area most likely to have had stone artefacts according to previous archaeological surveys. No scarred trees were sighted and this was expected as most large trees would have been removed years ago before farming commenced. Two artefacts were made on mudstone (the same type of material noted in 2011 lower down the slope in Marshmead). One was made on chalcedony which is associated with volcanic flows. It was observed that there were some small mudstone stones among the variety of pebbles on the property but not in great supply as was the quartz.

6. Discussion

The predictive model suggested there was a chance that Aboriginal stone artefacts would be found on this survey area and three were found. According to previous archaeological surveys, all stone artefacts that have been found in the Gunnedah area have been closely associated with water sources and this one was on the edge of the major watercourse in the area. Although much of the survey area had pebbles of various sizes present of quartz and few of black chert, artefacts based on these were not sighted. There were a few pieces of petrified wood large enough to have been knapped, but it like most petrified wood, is inclined to be layered and would have been of limited use as a knapping material unless it had started to opalise (personal experience). Some large sandstone rocks were present towards the top of Lot 27 but none appeared to have been used for grinding.That is not surprising given the nearby grinding grooves in Blackjack Creek with its reasonable supply of water is about 1100 metres south of the surveyed areas. It must also be pointed out that in old cultivated areas, whatever was present on the surface when the initial cultivation of a paddock took place, was usually buried by either a disc plough or in some cases in the late 19th and early 20th century, with a mouldboard plough. A tyned implement is usually used in subsequent cultivations when there is less debris on the surface and these implements pointed duckfoot type ends tend to bring stone to the surface. It is probable then that many of the stones now seen on the surface may not have been on the surface in Pre-European times, and so with the exception of the larger rocks, was not available on the top surface as raw material for knapping by the local Aboriginal people.

7. Conclusions

The results from this survey have added to the knowledge known about the possible locations of Aboriginal stone artefacts to the south of Gunnedah in areas with sandstone such as those areas in the Blackjack and Porcupine geological areas. Areas that have large watercourses in these geological formations although many times dominated by sandstone rocks have a high potential to have stone artefacts around them. Those that lack large watercourses in them are much less likely to contain artefacts such as in the north end of Hunts road.

8. Significance

8.1 Aboriginal Significance

Both David Horton and Jack Coglan (who stated that had connections with Blackjack Mountain in his younger days) regarded the stone artefacts of high value due to them being the only ones observed in the survey of the 60 ha. All three artefacts were made on material not commonly found in other sites. As such they needed to be protected along with the area between the bottom artefact and the two on the ants nest as it is likely there were more buried artefacts beneath the surface.

8.2 Archaeological Significance

Because these artefacts were found on the edge of the main watercourse they would probably have been disturbed by agricultural implements or vehicles in the past nevertheless they were probably dropped in the general vacinity of the watercourse. Because these three artefacts (two made on mudstone and one on chalcedony) are not commonly found in other artefacts scatters around the Namoi River (such as around Broadwater), it would appear that their source is on the southern side of Gunnedah. The result of the survey will add to the landscape model of the Red Chief Local Aboriginal Land Council's Territory of where Aboriginal artefacts are more than likely to be located on the south side of Gunnedah.

8.3 Educational Significance

Although blade-like artefacts are reasonably common, that artefact having a notched edge, would have a high significance for educational purposes.

9. Recommendations

The following recommendations are made:

After consultation with David Horton and Jack Coglan, it is recommended that an area of 62x5 metres towards the watercourse from a line joining the two ends of the site be excluded from any earthmoving and star posts be put around the artefacts at each end of the site with appropriate wire joining them. Wire should be put around the posts in the 2011 Marshmead 3 site as well plus it is recommended that an area of 15 metres around the 2011 Marshmead 3 site be excluded from disturbance such as house roadways or gardens. Otherwise there is no impediments to the subdivision going ahead with the provision always of - if in the course of road construction or drainage control, any Aboriginal artefacts are uncovered, the Red Chief Local Aboriginal Land Council and the Heritage Department at Dubbo be notified. They will then in consultation, decide on what course of action is to be taken.

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PHOTOGRAPHIC SECTION

PHOTOS 1, 2 AND 3

AREAS OF HEAV Y GRASS COVER

YOUNG EUCALYPTS, SHRUBS AND BARE GROUND

FARM TRACK RUNNING TOWARDS LOT 27 ACROSS THE WATERCOURSE

PHOTOS 4, 5 AND 6

LOOKING WEST ACROSS THE ANTS NEST ON OLD FARM TRACK

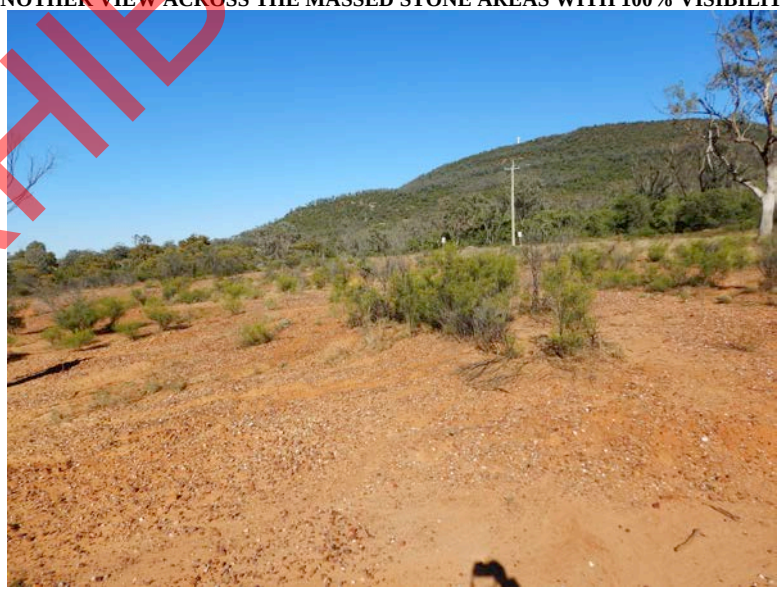
DEEP RUT IN BADLY WASHED AREA LOOKING UPHILL

SURFACE APPEARED TO HAVE BEEN SUBJECTED TO WIDESPREAD WATERFLOW

PHOTOS 7, 8 AND 9

WASHED AREA WITH MANY STONES ON SURFACE

ANOTHER VIEW ACROSS THE MASSED STONE AREAS WITH 100% VISIBILITY



LINE OF SHRUBS SHOWS THE FORMER LEVEL OF THE SOIL BEFORE EROSION

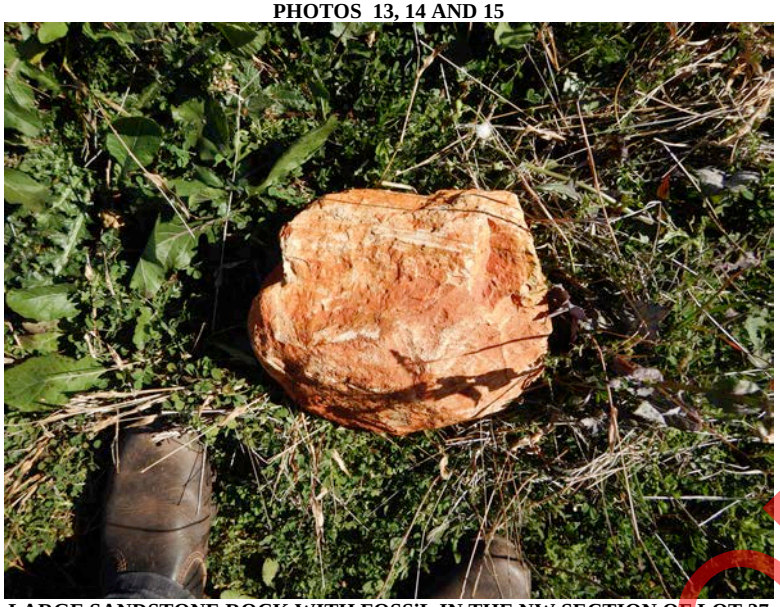
PHOTOS 10, 11 AND 12

SMALL DAM NEAR THE WESTERN BOUNDARY

BARE PATCHES IN THE NW AREA OF LOT 27

HEAVILY GRASSED AREA IN NW OF LOT 27

PHOTOS 13, 14 AND 15



LARGE SANDSTONE ROCK WITH FOSSIL IN THE NW SECTION OF LOT 27

TYPICAL OF THE RED SOIL THROUGHOUT LOT 27

TEFF CROP GROWING IN LOT 27 SHOWING LIMITED GROUND VISIBILITY

PHOTOS 16, 17 AND 18

LAST SECTION OF LOT 27 SURVEY APPROACHING THE WATERCOURSE

THE START OF LOT 28 SURVEY WITH FLAG DENOTING THE 1ST ARTEFACT FOUND

ANTS NEST END OF MARSHMEAD 4 SITE LOOKING EAST DOWN THE FARM TRACK

PHOTOS 19, 20 AND 21

THE 3 ARTEFACTS – FIRST TWO FROM LEFT FROM NEAR THE ANTS NEST

HEAVY VEGETATION COVER SOUTH OF CONSTRUCTED CHANNEL

BARE PATCH IN THE CENTRE OF CONSTRUCTED CHANNEL

PHOTOS 22, 23 AND 24

ERODED SOIL ABOVED THE CONSTRUCTED CHANNEL

THE DAM ON THE WESTERN BOUNDARY

OVERGROWN AREA NEXT TO THE WESTERN BOUNDARY WITH SOME BARE PATCHES

PHOTOS 25, 26 AND 27

CATTLE YARDS NEAR THE SW BOUNDARY

OVERGROWN AREA ABOVE THE TEFF CROP IN THE WEST OF LOT 28

DAVID HORTON AND JACK COGLAN SURVEYING DOWN THE SOUTHERN BOUNDARY

PHOTOS 28, 29 AND 30

LARGE BANK OF SOIL IN THE SE CORNER

TOP OF THE LARGE SPOIL LOOKING NORTH FROM THE SE CORNER

DAVID HORTON AND JACK COGLAN SURVEYING THE TEFF CROP ALONG THE EASTERN BOUNDARY

PHOTOS 31, 32 AND 33

PART OF THE CONTOUR BANK IN THE LOWER PART OF LOT 28

THE THICKEST PART OF THE TEFF CROP ABOVE THE CONTOUR BANK

THE 2011 MARSHMEAD 3 SITE

APPENDIX 1

GLOSSARY OF GEOLOGICAL AND ARCHAEOLOGICAL TECHNICAL TERMS

Glossary

Unless specified otherwise, geological terms were adapted from The Penguin Dictionary of Geology by Whitten and Brooks 1988, The New Penguin Dictionary of Geology by Kearey 1996, or when in reference to artefact analysis from Gaynor (1987, 1996) and Wilson (1994).

adamellite: a medium to coarse grained, inequigranular igneous rock. Eighty percent of the rock is composed of plagioclase, orthoclase and quartz in roughly equal amounts with 10% hornblende and 10% biotite. Adamellite occurs like granite as batholiths.

alluvium: sand or silt deposited by a river, stream or creek when it is forced to drop its suspended load as the water flow is slowed down causing it to lose the energy needed for the transport of the material.

andesitic greywacke: greywacke is a very poorly sorted marine sandstone. Andesitic greywackes are so called because they contain fragments of andesite (a volcanic/igneous rock). The andesitic greywacke from the "Moore Creek Aboriginal Axe Quarry" on the property "Daruka" has had a unique geological history which makes it ideal for axe manufacture and which makes it very easy to recognise in hand specimen.

aplite: a fine-grained equigranular rock composed occurs mainly as dykes or sills.

argillite: a sedimentary rock, commonly a siltstone or a mudstone, which has lost its ability to cleave along its bedding due to metamorphism. Argillites can have a conchoidal fracture.

artefact scatter: a number of stone artefacts located on open ground within 50 metres of each other. The scatter may or may not have a particular pattern.

assemblage: in stone artefact analysis the term assemblage refers to all the artefacts being analysed. These may be from a single site, from a section of a site, from a number of sites.

axe: an artefact will be classed as an axe if it has been edge-ground to produce a cutting edge and is of a shape suitable for use as a hand held or hafted axe. An artefact will also be classed as an axe if it fulfills the above criteria except for the edge-grinding but displays identifiable use-wear.

axe blank: a piece of stone of a raw material, shape and size suitable for the manufacture of an axe that has undergone some modification other than grinding (flaking, hammerdressing).

background noise: naturally broken rock or gravel, which may make stone artefactual material difficult to discern.

bipolar reduction: a method of flake production which entails placing the stone to be flaked (core) onto an anvil (usually a flat stone) and striking it with the hammerstone at an angle of 90∞. Flakes removed in this manner do not have bulbs of percussion and are generally shear sided. Crushing will be observed on both the platform (from the impact of the hammerstone) and termination (from contact with the anvil) of the flakes.

blade: a specialised flake which is either triangular or trapezoid in cross-section and which has parallel or sub-parallel lateral margins. There can be one or more dorsal ridges, which are generally parallel to the long axis of the blade. Blades are generally struck from a specialised core, which has been set up for the continued production of blades (see blade core). Blades by definition are more than twice as long as they are wide. The manufacture of thin blades allows a knapper to make more flakes from a single core, thus, producing more cutting edges from the same amount of raw material.

broad platform: broad platform surface covers the entire top of the flake when viewed from above.

bulb of force or bulb of percussion: both terms refer to a convex bulge on the ventral surface of the flake just below its platform. The bulb is caused by the passage of the force loaded into the core when the hammerstone strikes the platform. This force travels down through the raw material causing a fracture which detaches the flake from the core. Some of the force is reflected back from the surface of the flake and this forms the bulb which is recognised as the main indicator of humanly modified stone.

bulbar scars: these appear as a series of small scars along the length of a longer flake scar. They can be caused by pressure flaking with a soft pointed implement. Often seen on old bottle bases used by Aboriginal people for artefacts after contact time.

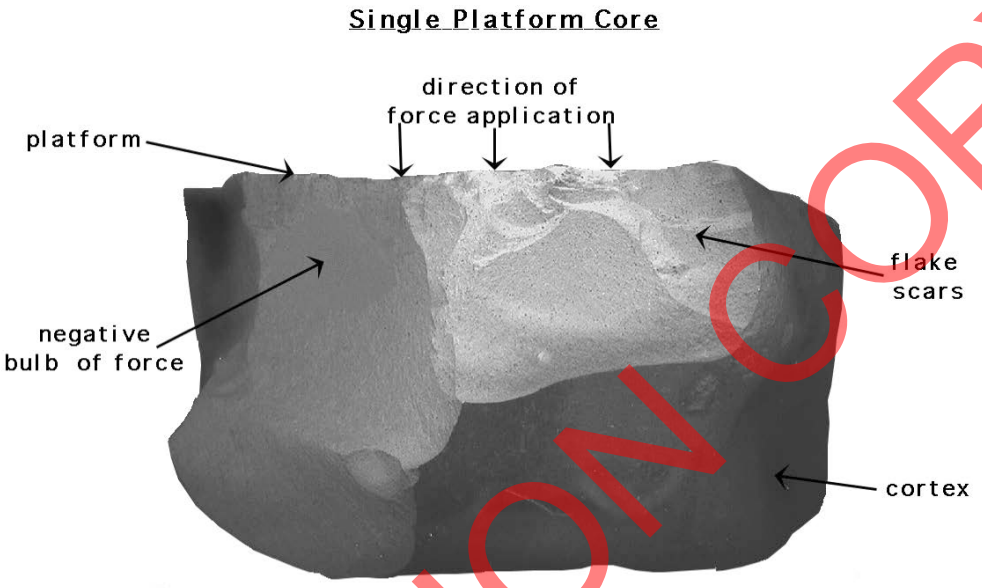
bulbar scars on a bottle base

conchoidal flake: a conchoidal flake is produced when a core is struck by a hammerstone during freehand percussion. If a conchoidal flake is intact it will display a bulb of percussion, a striking platform and a ring crack may be discernible. It may also be possible to discern the removal of small secondary flakelets beneath the striking platform on the ventral surface.

colluvium: sediments transported by rain splash, wind, creep etc. Not transported by a river or creek.

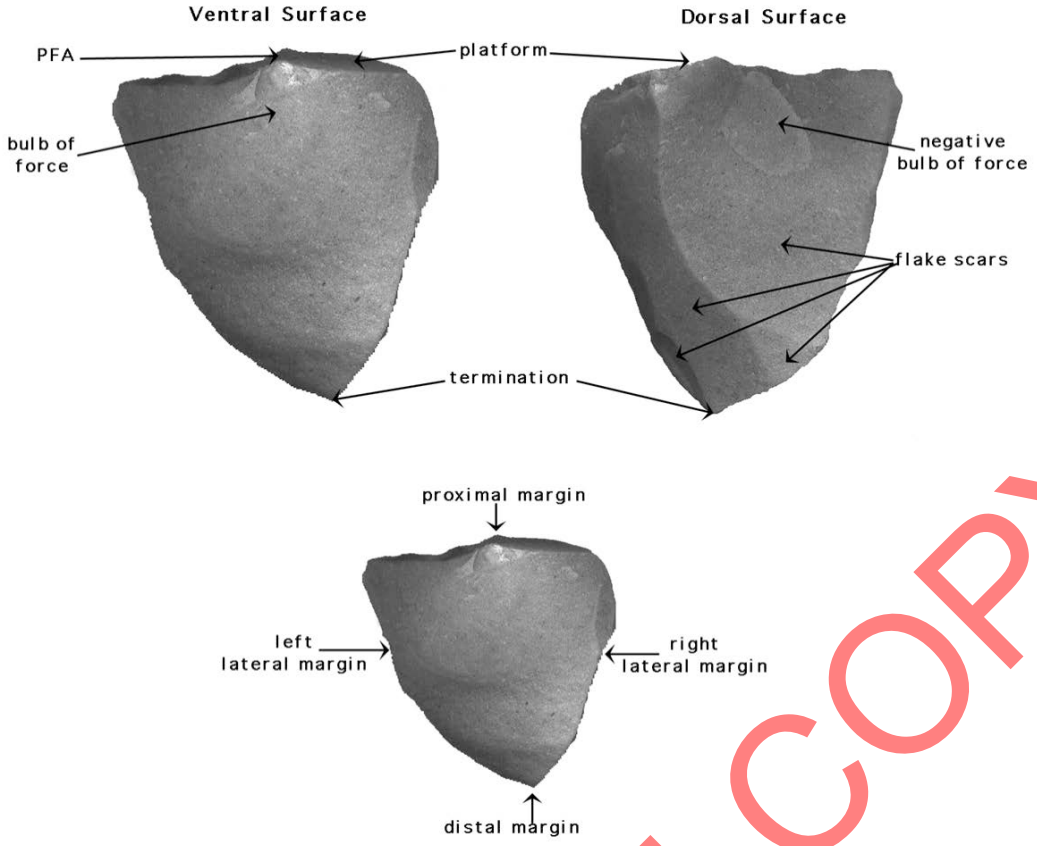
cherty argillite: a very fine-grained sedimentary rock which has undergone silicification.

chalcedony: a microcrystalline variety of quartz. It can be a variety of colours depending on the material it came in contact with when formed. It is usually associated with volcanic material such as basalt or rhyolite where it fills holes or vugs in the rock. As the parent rock decays, the chalcedony is set free.
cone fracture: a break which runs from the PFA to the termination of the flake and which cuts the PFA in half. Cone fractures are an indication that the knapper used too much force to remove the flake causing it to break.
conglomerates: a group of sedimentary rocks that are rounded or sub rounded and are cemented together in another material.
contact metamorphism: changes brought about in rocks within the crust of the earth by heat from contact with igneous rocks.
core: a piece of raw material from which flakes have been struck. Cores may have negative bulbs of percussion or straight shear edges according to the method of reduction. It will always display at least one flake scar.
cortex: the weathered surface of a rock.



CORE ATTRIBUTES

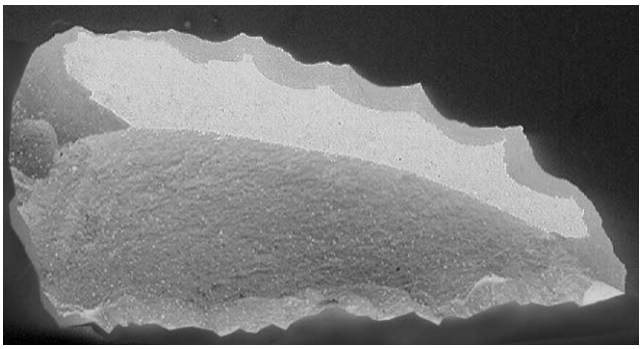
cortex % : the percentage of cortex remaining on an artefact is an indication of the stage in the reduction sequence at which it was discarded. The more cortex remaining on the artefact the earlier in the reduction sequence.
curation: in reference to the use of raw materials curation refers to methods by which raw material is conserved. This may be because it is in short supply due to distance from its source or when access to its source is restricted.
Devonian: a period of the Palaeozoic era dating from 362.5 to 408.5 million years ago.**distal:** in reference to a flake the distal margin is the bottom of the flake or that margin that contains the termination.
distal : the end opposite the platform or proximal end of a flake. It can be pointed or blunt or anything in between.
dorsal surface: the dorsal surface of a flake is the surface which once constituted the outside surface of the core (see ventral surface). It may or may not exhibit flake scars.
dyke: a sheet-like body of igneous rock which cuts across the bedding or structural planes of the host rock.
edge-ground: an artefact is described as edge-ground when it has a margin which has been polished to form a bevelled edge. Sandstone when combined with small amounts of water is excellent as a grinding medium but other material has been sometimes used by Aboriginal people in the past by the application of sand on a suitable rock such as aplite.
feather termination: feather terminations occur when the fracture path continues through the core to the core surface without changing its direction or losing velocity and produces a flake with a sharp feathered edge. A feather termination is the mark of a competent knapper and indicates that they had an understanding of the characteristics of the raw material by their placement of the percussive blow in the correct position and by the use of suitable force applied in the right direction.



FLAKE ATTRIBUTES

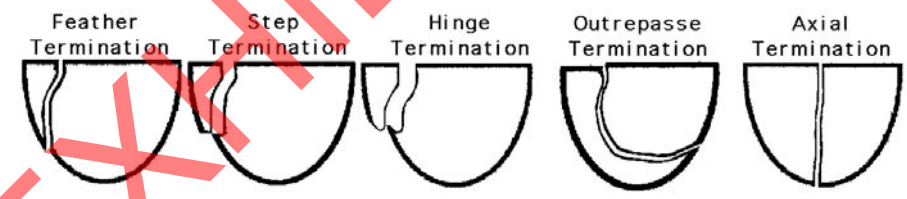
flake: a piece of stone detached from a larger mass (generally termed a core) by the application of force. Attributes of whole flakes are platforms, terminations, lateral margins, a ventral and dorsal surface and a bulb of force.
flake scar: a concave surface which has resulted from the removal of a flake
flaked piece: Pieces of worked stone which do not have attributes which allow them to be called flakes or cores ie. bulbs of percussion, PFA's or platforms, but they do exhibit at least one flake scar. Therefore, while they can not be classed as cores, flakes, or even broken flakes, they can still be recognised as an artefact.
focal platform: the platform surface does not cover the entire top of the flake when viewed from above. Focal platforms are usually an indication of a high degree of knapping skill with precise control of the applied force of the hammerstone on the platform.
freehand percussion: in this method of flake production the core is held in one hand and the hammerstone in the other. The hammerstone is brought down close to the edge of the core with a downward and slightly outward motion. If the core has an edge angle of less than 90∞ a flake of stone should be detached. Flakes removed in this manner generally have a bulb of percussion and are described as conchoidal flakes.
GPS: a handheld global positioning system which depends on orbiting satellites to determine position on ground.
granitic intrusions: a body of rock which forms when magma pushes up through the existing rock strata, thus intruding it. The magma subsequently cools slowly and crystalises below the surface forming what are commonly known as plutons or batholiths. Sometimes cracks in these intrusions are intruded at a later date by other molten material. These intrusions are generally narrow or sheet-like and are referred to as dykes.
grindstone/millstone: a stone exhibiting surfaces that have been smoothed and polished from being ground. It may display grooved, dished or flat surfaces. The term millstone refers to the type of grindstone which formed the basal slab or stone being ground upon for the preparation of food. Mullers were the top grindstones that were held in the hand to do the grinding. Other grindstones were used for the preparation of cutting edges on stones axes. This is known as edge-grinding.
hafted: a hafted implement is one which was attached to a handle (eg. an axe)or mounted on the end of a spearthrower(eg. a flake used for wood adzing).
hammerdressed: hammerdressing is a form of artefact reduction which involves impact of the hammerstone with the surface of the artefact in a manner which removes unwanted bulk by crushing rather than by flake removal. Hammerdressing is a very slow and tedious form of reduction and is generally only seen on artefacts which have a long use-life, such as an axe. Hammerdressing is usually only employed when the raw material is intractable. It is a common method of reduction in axe manufacture as intractable raw materials are the most suitable for use as chopping implements. Hammerdressing is also often used to create the groove on axes which were to be hafted.
hammerstone: a stone used to strike another piece of stone (a core) to remove flakes.
hinge termination: when the flake has a rounded or blunted termination which occurs at right angles to the longitudinal axis. Hinges are caused by the application of the percussive force at an incorrect angle causing the termination to run away from the long axis. The presence of this type of termination usually indicates poor control by the knapper.
Holocene: the geological epoch which encompasses the last 10,000 years of the earth's history.

hornfels: a medium to fine-grained metamorphic rock in which all the granules are of equal size. The hornfels discussed in this report is very hard and black to grey in colour and has been derived from a metamorphosed siltstone. In general, however, this rock is produced by high grade contact metamorphism of a sedimentary or igneous rock. Hornfelses are generally hard, compact and may exhibit a range of conchoidal fracture from good to poor. Fresh flakes have a dull lustre and a somewhat porous appearance. The more intractable hornfelses make excellent axe materials.
igneous: a solid crystalline or glassy rock formed by crystallisation from a magma.
in-situ: latin for "in place". In the case of an excavation recording artefacts in-situ means that the position of the artefacts was recorded prior to their removal for analysis in the laboratory. The in-situ analysis of artefacts on the other hand refers to them being analysed in the field and left where they were found.
intrusion: a body of igneous rock which has forced its way up through the existing rocks.
jasper: a variety of chert which is red in colour.
knapper: a person who modifies stone by removing flakes from it by direct percussion or pressure.
knapping quality: refers to the ability of the raw material to produce flakes with thin sharp margins when struck by a hammerstone. Knapping quality is highly variable between different raw material types and even within different pieces of raw material of the same type. Knapping quality can be affected by faults in the stone or by the degree of weathering of the stone. The best stone for flaking is stone which is isotropic nature (see isotropic).
lateral margin: the lateral margins of a flake are the two edges (right and left) of the flake which join the platform (top) of the flake and the termination (bottom) of the flake.
longitudinal snap: longitudinal snaps are breakages which occur from the proximal to the distal end (top to bottom) of the flake and are usually thought to initiate during manufacture. Longitudinal snaps are caused by too much force during knapping and are an indication of poor knapping control.
lustre: a greasy shine exhibited by artefacts or raw materials when they have been heat treated to increase their flaking quality.
medial: the medial section of a flake is the middle section above the termination and below the platform.
metamorphism: changes brought about in rocks within the crust of the earth by heat from contact with igneous rocks (contact metamorphism), or heat and pressure from deep burial (regional metamorphism) or from directed pressure (in fault and shear zones).
motif: in reference to rock art--a single figure or design.
muller: a hand-held stone used for grinding seed on a grindstone.
patinated: the term patinated or patination refers to the weathering skin which forms on the outside of the stone artefact.
Permo-Carboniferous: Permo-Carboniferous refers to a geological time period which spanned the Carboniferous Period (360 to 280 million years ago) and the Permian Period (280 to 245 million years ago).
negative flake scar: the scar left on the core resulting from the removal of a flake.
notch : an indentation in the side of a flake manufactured by the removal of one or several smaller flakes from its margin.
petrified wood : a fine grained siliceous rock which forms when the carbon atoms in buried wood is replaced by silica.
PFA: stands for "point of force application" and refers to the point on the platform where the hammerstone made contact with the core. The PFA is removed from the core and forms part of the platform of the resultant flake
platform: the area on the proximal end of a flake where the force was applied to remove it from the core.
platform angle: the angle measured between the platform and the dorsal side of the flake. The recording of the platform angle is important when trying to assess the skill of the knapper.
platform type: the type of platform is important when trying to assess the knapper's skill in placing the blow on the platform with the hammerstone and also in determining the amount of force used (see broad and focal). The platform end is also called the **proximal** end.
Pleistocene: the geological epoch which encompasses the time period from the end of the Pliocene (approximately 1.8 million years ago) to the beginning of the Holocene (10,000 years ago). The Pleistocene is the part of the Quaternary Period.
preform: an artefact reduced to an axe shape that has not been ground and does not exhibit use-wear.
proximal: in reference to a flake the proximal margin is the top of the flake or that part of the flake that contains the platform.
quartz: a silicate mineral which is normally colourless or white but may be any colour depending on the amount and type of impurities it contains. Quartz is very hard and when crystalline will flake with a conchoidal fracture. However, crystalline quartz is rare and most quartz breaks with a ubiquitous fracture. That is, it breaks along faults and cracks in the rock. Quartz is often found as pebbles in rivers or in conglomerates and as reefs or veins in igneous areas.
Quaternary : the most recent period in geological sequence terms.
retouch : retouch refers to the modification of an artefact by the removal of flakes from one or more of its margins in an effort to shape it into a specific tool or to resharpen it.



Flake showing retouched/resharpened edges

rotation: when the angle on the edge of a core becomes greater than 90 degrees the core may be rotated and a new platform initiated or the core may be discarded and another core utilised. If that particular raw material is in short supply for any reason (distance to quarry, socio-cultural reason for restriction of access) then core rotation will be utilised to increase the use-life of the core. Core rotation can be recognised on flakes by the orientation of the various flake scars on the dorsal surface of the flake. Core rotation is a method for the conservation of raw material.
sandstone: a sedimentary rock composed mainly of sand-sized mineral grains weakly cemented together in a clay matrix.
scree: loose rock rubble located below outcrops.
scree pebble : a rock rounded by rolling down slopes over thousands of years. They sometimes could be mistaken for river pebbles. Very common in greywacke rocks around Tamworth (personal observations).
silcrete : silcrete is formed by the cementation of rock or sediments by silica via their infiltration by silica rich waters. Thus the grain size of a silcrete can vary from very fine sand to boulders. Silcretes are more than 90% silica and when knapped they fracture though, rather than around individual granules/inclusions held within their matrix. Because of its high silica content, fine grained silcrete is an excellent raw material for making stone artefacts.
siltstone: very fine-grained sedimentary rock formed by the deposition of silt.
single platform core: a single platform core is indicated when all the scars on a flake or core run in the same direction. The core shown in Figure 1 is a single platform core. The presence of a single platform on a core indicates that the flakes have been struck from one surface and only in one direction. A single platform on a core can indicate that the raw material from which it was manufactured was plentiful and there was no need to conserve it by rotating the core.
step termination: when a flake terminates abruptly in a right angled break. Steps occur when too much outward force is applied to the core and are an indication of poor control by the knapper. Alternatively, a step may occur when a fault is encountered in the raw material.
taphonomic processes : those processes that determine what has happened to the artefact in the period from when it was discarded to when it was rediscovered (eg. weather, ploughing, etc.).
termination: the proximal end of an intact flake. The type of flake termination is directly associated with the direction of the percussive force used to make the artefact (See feather termination, hinge termination and step termination).



The five most common flake terminations

transverse snap: a breakage which occurs between the lateral margins of the flake. Transverse snaps are often the result of treadage or traffic in the site. The number of flakes with transverse snaps may be used to hypothesise about intensity of site use.
tors: large, rounded granitic boulders. When granitic rocks are relieved of the pressure of overlying rocks they begin to expand. This causes the rock to joint (crack). Jointing results in the formation of square-sided boulders. Once exposed to chemical and mechanical weathering these square sided boulders begin to exfoliate (the outer layers peel away like the layers of an onion) this eventually leads to the formation of the rounded boulders typical of granitic areas and commonly known as tors.
tuff: a rock consisting of hardened volcanic ash and dust.
unifacial: flakes removed from an edge in one direction only.
ventral surface: the ventral surface of a flake is the new surface created when the flake is removed from the core.

visibility: visibility refers to the percentage of the ground surface which is visible for inspection during an archaeological survey. If the ground is completely covered with dense vegetation then visibility is 0%. If only half of the ground surface is covered by vegetation then visibility is 50% and so on. Visibility can be affected by vegetation, leaf litter, water covering the ground surface, snow, rock rubble etc. The number of artefacts located during a survey may often be directly related to ground surface visibility.
weathered: when referring to stone artefacts weathered refers to the degree to which exposure to the elements has caused the rock to be discoloured and disintegrate. The more weathered the stone the more difficult it is to identify its raw material type.

APPENDIX 2

RESULTS OF THE SEARCH FOR ABORIGINAL SITES ON THE AHIMS REGISTER IN THE SURVEY AREA

Office of Environment & Heritage

AHIMS Web Services (AWS)
Search Result

Purchase Order/Reference : ewing

Client Service ID : 554392

Stewart Surveys

PO Box 592
Gunnedah New South Wales 2380
Attention: Kathryn Yigman

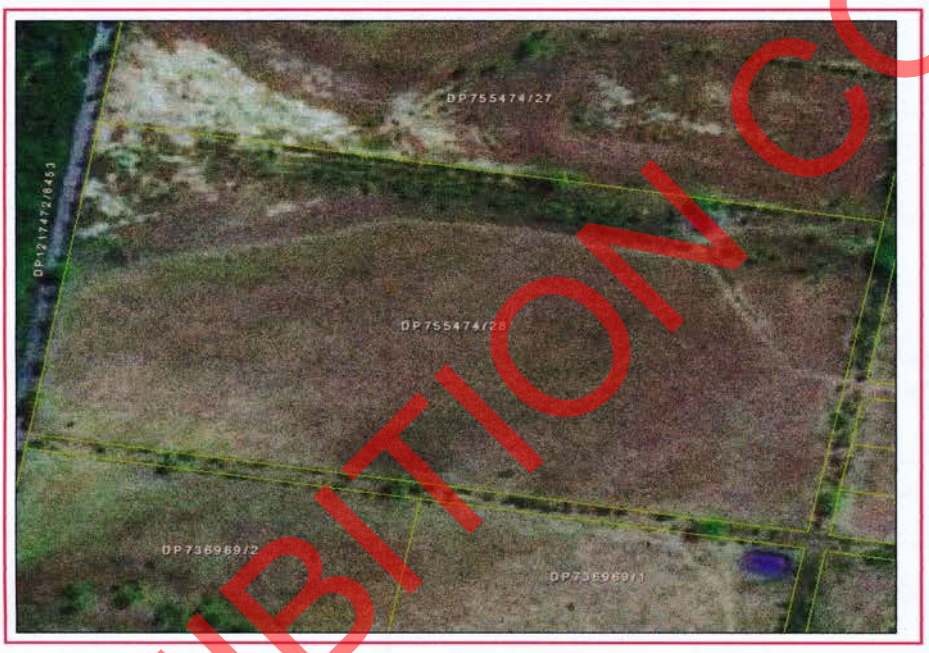
Email: kathryn@stewartsurveys.com

Date: 03 December 2020

Dear Sir or Madam:

AHIMS Web Service search for the following area at Lot : 28, DP:DP755474 with a Buffer of 0 meters, conducted by Kathryn Yigman on 03 December 2020.

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 the Office of the Environment and Heritage 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. *

Office of Environment & Heritage

AHIMS Web Services (AWS)
Search Result

Purchase Order/Reference : ewing

Client Service ID : 554396

Stewart Surveys

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Gunnedah New South Wales 2380
Attention: Kathryn Yigman

Email: kathryn@stewartsurveys.com

Date: 03 December 2020

Dear Sir or Madam:

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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 the Office of the Environment and Heritage AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that:

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

APPENDIX 3

ARTEFACT ANALYSIS SHEET AND KEY TO NUMBERING SHEET

KEY TO NUMBERING SYSTEM FOR ARTEFACT IDENTIFICATION AND ANALYSIS

No.:
Artefact number

Type: Artefact Type
1. Flake
2. Broken flake
3. Retouched flake
4. Flaked piece
5. Core
6. Axe/Preform/Blank
7. Millstone/Grindstone/Muller
8. Anvil
9. Hammerstone
10. other

RM: Raw Material
0. indeterminate
1. greywacke
2. chert
3. tuff
4. quartz
5. quartzite
6. cherty argillite
7. hornfels
8. silcrete
9. sandstone
10. dolerite
11. Aplite
12. chalcedony
13. petrified wood
14. ignimbrite
15. Basalt
16. Trachyte
17. Granitic
18. Mudstone
19. Siltstone
20. Glass
21. Jasper

K.M. Knapping Method
0. indeterminate
1. freehand percussion
2. bipolar reduction
3. ground

LGTH: Length
To nearest mm./maximum length
for flakes and block length for other types

WDTH: Width
To nearest mm./maximum width for flakes
and block width for other types

THICK: Thickness
To nearest mm./maximum thickness for
flakes and block thickness for other types

%C
Percentage of cortex on artefact
Dorsal cortex for flakes

OF: ORIGINAL FORM
0. indeterminate-no cortex
1. pebble
2. outcrop
3. scree

Flake platform type
1. Broad
2. Focal
3. Damaged

FLAKE BREAK TYPE
1. Transverse
2. longitudinal

FLAKE BREAK POSITION FOR
TRANSVERSE BREAKS
1. Centre
2. Proximal
3. Distil

MARSHMEAD 4 ARTEFACTS RECORDED 27/05/2021 BY PAT GAYNOR AND DAVID HORTON AT 0233549E, 6565352N

no	TYPE	RM	KM	LGTH	WDTH	THICK	%C	OF	Comment
1	3	18	1	35	17	7	0	0	BLADE SHAPED STRIPED MUDSTONEAND NOTCHED 1 CUTTING EDGE AND VERY SHARP THE OTHER . - FOCAL PLATFORM
2	1	18	1	18	17	3	0	0	FOCAL PLATFORM, FLAKE OFF VENTRAL SIDE LOOKS LIKE THEN USED AS A CORE LOOKS TO BE SIMILAR MATERIAL BUT NOT THE SAME COLOUR AS 1
3	1	12	1	20	14	4	15	2	LOOKS LIKE CHALCEDONY -FOCAL PLATFORM, SHARP EDGES - MAY BE REEF OR OUTCROP BASED

APPENDIX D

ABORIGINAL HERITAGE INFORMATION MANAGEMENT SYSTEMS SEARCH RESULTS

Stewart Surveys Pty Ltd
ABN 65 002 886 508

109 Conadilly Street
PO Box 592
Gunnedah NSW 2380

T 02 6742 2966
F 02 6742 0684
cstewart@stewartsurveys.com

AHIMS Web Services (AWS)
Search Result

Purchase Order/Reference : ewing

Client Service ID : 554396

Stewart Surveys

PO Box 592
Gunnedah New South Wales 2380
Attention: Kathryn Yigman

Email: kathryn@stewartsurveys.com

Date: 03 December 2020

Dear Sir or Madam:

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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 the Office of the Environment and Heritage AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that:

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

If your search shows Aboriginal sites or places what should you do?

- You must do an extensive search if AHIMS has shown that there are Aboriginal sites or places recorded in the search area.
- If you are checking AHIMS as a part of your due diligence, refer to the next steps of the Due Diligence Code of practice.
- You can get further information about Aboriginal places by looking at the gazettal notice that declared it. Aboriginal places gazetted after 2001 are available on the NSW Government Gazette (http://www.nsw.gov.au/gazette) website. Gazettal notices published prior to 2001 can be obtained from Office of Environment and Heritage's Aboriginal Heritage Information Unit upon request

Important information about your AHIMS search

- The information derived from the AHIMS search is only to be used for the purpose for which it was requested. It is not be made available to the public.
- AHIMS records information about Aboriginal sites that have been provided to Office of Environment and Heritage and Aboriginal places that have been declared by the Minister;
- Information recorded on AHIMS may vary in its accuracy and may not be up to date .Location details are recorded as grid references and it is important to note that there may be errors or omissions in these recordings,
- Some parts of New South Wales have not been investigated in detail and there may be fewer records of Aboriginal sites in those areas. These areas may contain Aboriginal sites which are not recorded on AHIMS.
- Aboriginal objects are protected under the National Parks and Wildlife Act 1974 even if they are not recorded as a site on AHIMS.
- This search can form part of your due diligence and remains valid for 12 months.

3 Marist Place, Parramatta NSW 2150
Locked Bag 5020 Parramatta NSW 2220
Tel: (02) 9585 6380 Fax: (02) 9873 8599

ABN 30 841 387 271
Email: ahims@environment.nsw.gov.au
Web: www.environment.nsw.gov.au

AHIMS Web Services (AWS)
Search Result

Purchase Order/Reference : ewing

Client Service ID : 554392

Stewart Surveys

Date: 03 December 2020

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ABN 30 841 387 271
Email: ahims@environment.nsw.gov.au
Web: www.environment.nsw.gov.au

APPENDIX E

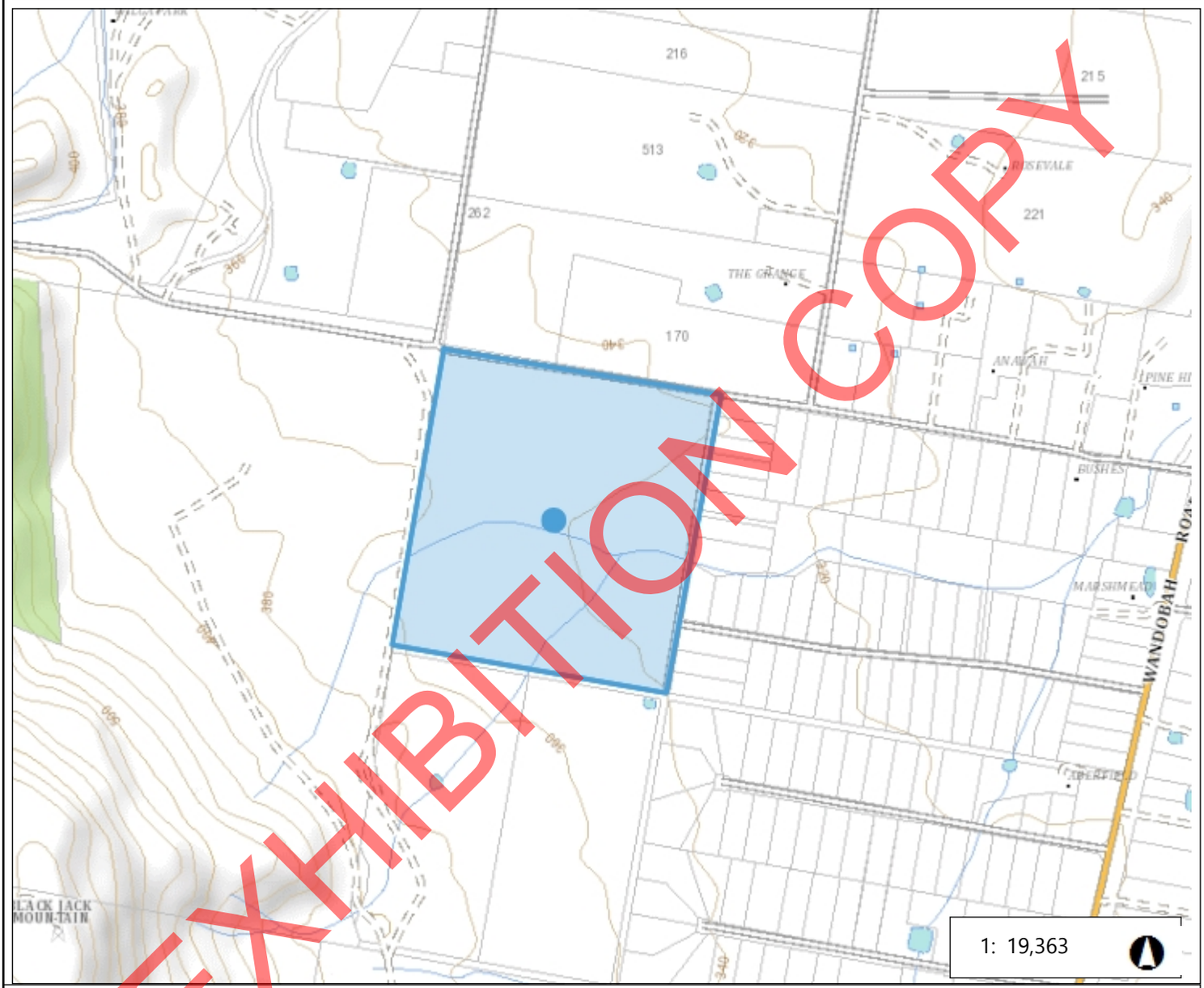
BIODIVERISTY OFFSET SCHEME (BOS) ENTRY THRESHOLD MAP

Stewart Surveys Pty Ltd
ABN 65 002 886 508

109 Conadilly Street
PO Box 592
Gunnedah NSW 2380

T 02 6742 2966
F 02 6742 0684
cstewart@stewartsurveys.com

Biodiversity Offset Scheme (BOS) Entry Threshold Map



983.7 0 491.83 983.7 Metres

WGS_1984_Web_Mercator_Auxiliary_Sphere

This map is a user generated static output from an Internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.

THIS MAP IS NOT TO BE USED FOR NAVIGATION

Legend

- Biodiversity Values that have been mapped for more than 90 days
- Biodiversity Values added within last 90 days

Notes

Biodiversity Values Map and Threshold Report

Results Summary

Date of Calculation	01/02/2022 2:16 PM	**BDAR Required***
Total Digitised Area	62.49 ha	60.5ha
Minimum Lot Size Method	LEP	
Minimum Lot Size	1.2 ha	9000m²
Area Clearing Threshold	0.5 ha	0.25 ha
Area clearing trigger Area of native vegetation cleared	Unknown #	~~Unknown~~ # EXCEEDS
Biodiversity values map trigger Impact on biodiversity values map(not including values added within the last 90 days)?	no	~~no~~YES
Date of the 90 day Expiry	N/A	

*If BDAR required has:

- at least one 'Yes': you have exceeded the BOS threshold. You are now required to submit a Biodiversity Development Assessment Report with your development application. Go to https://customer.lmbc.nsw.gov.au/assessment/AccreditedAssessor to access a list of assessors who are accredited to apply the Biodiversity Assessment Method and write a Biodiversity Development Assessment Report
- 'No': you have not exceeded the BOS threshold. You may still require a permit from local council. Review the development control plan and consult with council. You may still be required to assess whether the development is '"likely to significantly affect threatened species' as determined under the test in s. 7.3 of the Biodiversity Conservation Act 2016. You may still be required to review the area where no vegetation mapping is available.

Where the area of impact occurs on land with no vegetation mapping available, the tool cannot determine the area of native vegetation cleared and if this exceeds the Area Threshold. You will need to work out the area of native vegetation cleared - refer to the BOSET user guide for how to do this.

On and after the 90 day expiry date a BDAR will be required.

Disclaimer

This results summary and map can be used as guidance material only. This results summary and map is not guaranteed to be free from error or omission. The State of NSW and Office of Environment and Heritage and its employees disclaim liability for any act done on the information in the results summary or map and any consequences of such acts or omissions. It remains the responsibility of the proponent to ensure that their development application complies will all aspects of the *Biodiversity Conservation Act 2016.*

The mapping provided in this tool has been done with the best available mapping and knowledge of species habitat requirements. This map is valid for a period of 30 days from the date of calculation (above).

Acknowledgement

I as the applicant for this development, submit that I have correctly depicted the area that will be impacted or likely to be impacted as a result of the proposed development.

Signature Kathryn Gigman Date: 01/02/2022 02:16 PM

APPENDIX F

SOIL LANDSCAPE PROFILE

- Frw (Fullwoods Road)

Stewart Surveys Pty Ltd
ABN 65 002 886 508

109 Conadilly Street
PO Box 592
Gunnedah NSW 2380

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Landscape— Extremely long (400 - 2,500 m) pediment footslopes comprised of coalescing alluvial fans below Permian and Triassic lithic sandstone hills. Slopes 2 - 8%, local relief <80 m, elevation 290 - 400 m. Mostly cleared open woodland.

Soils— Mostly degraded very deep to giant, moderately well-drained Red and Brown Chromosols (Red-brown Earths) with deep to very deep, well-drained Red Kandosols (Red Earths) common on upper footslopes.

Qualities and limitations— moderate soil fertility, localised foundation hazard, localised dieback, widespread recharge zone, localised discharge zone, localised salinity hazard, localised gully erosion hazard, localised sheet erosion hazard, widespread high run-on, localised permanently high watertables.

LOCATION AND SIGNIFICANCE

Long pediment footslopes and alluvial fans derived from Permian and Triassic sandstone hills in the Curlewis Hills. Type location is E end of Fullwoods Rd, 8 km SE of Curlewis and 17 km NW of Breeza (MGA grid reference 242500E, 6548900N, grid zone 56).

Variants

None.

Included landscapes

None.

LANDSCAPE

Landform

Coalescing alluvial fan systems on long (400 - 2,500 m) pediment footslopes below Permian and Triassic sandstone hills, with slopes between 2 - 8%, local relief <80 m and elevation ranging from 290 - 400 m. Upper slopes are steeper with gradients up to 8% and incised drainage lines, whilst lower slopes are dominated by sheetflow with a few gullies.

Localised saline outbreaks are found in the floors of deep gullies and along lower footslopes, particularly where subsurface drainage may be impeded, e.g., by roads.

Geology

Quaternary alluvial/colluvial complex derived from Permian and Triassic sandstones and conglomerates deposited as a complex of interlocking fans. Depth to bedrock is generally >6 m. Most of the fan material overlies Permian sandstones and conglomerates.

Vegetation

Open woodland mostly cleared originally for agriculture. Dominant species which occur in remnant patches of vegetation and in regrowth areas include Eucalyptus albens (white box), E. melliodora (yellow box), E. populnea (bimble box), E. pilligaensis (pilliga box), Casuarina cristata (belah), Brachychiton populneus (kurrajong), Geijera parviflora (wilga), Heterodendron oleifolium (rosewood), Eremophila mitchellii (budda), Acacia deanei ssp. deanei (Deane's wattle), A. aneura (mulga), and A. harpophylla (brigalow).

Ground cover species include Stipa spp. (spear grasses), Aristida spp. (wire grasses), Bothriochloa ambigua (red grass), Dicanthium sericeum (blue grass), Eragrostis spp. (love grasses) and Panicum spp. (panics).

Climate

Estimated average annual rainfall ranges from 560 - 640 mm/year.

Hydrology

Not recorded.

Land use

Most of this soil landscape was originally cleared for cultivation, though grazing of cattle and sheep on improved pastures is now the dominant land use. Cropping is generally carried out in rotation with pasture phases, although some continuous cropping may still be found.

Land degradation

Severe gully erosion is associated with previously intensive cropping, and most gullies are relatively stable. Severe sheet and rill erosion is common in some areas. Structural decline from previous continuous cropping systems is evident in the form of plough pans, and where continuous cultivation is still carried out the remaining topsoil has become a dense compacted mass. Saline outbreaks are found on lower footslopes and fans and in association with structural controls such as roads.

Erosion hazard

Land use	Non-concentrated flows	Concentrated flows	Wind
cultivation	moderate	high	moderate
grazing	low	moderate	low

SOILS

Soil Variation and Distribution

Upper footslopes are dominated by deep to very deep, well-drained Red Kandosols (Red Earths), with total soil depth <2 m. Mid to lower footslopes are generally dominated by very deep to giant, moderately well-drained Red and Brown Chromosols (Red-brown Earths), with total soil depth often >5 m.

QUALITIES AND LIMITATIONS

Capabilities

Land and Soil Capability	5	**Urban Capability**	A
Soil Regolith Class	R4 (R3)		

Limitations to Land Use

Grazing	low	**Cultivation**	moderate to high
Urban	low to moderate		

Landscape

Steep slopes	not observed	**Mass movement hazard**	not observed
Rock outcrop	not observed	**Rockfall hazard**	not observed

Foundation hazard	localised	**Woody weeds**	not observed
Complex terrain	not observed	**Productive arable land**	not observed

Soils

Shallow soils	not observed	**Poor moisture availability**	not observed
Non-cohesive soils	not observed	**Soil fertility**	moderate

Hydrology

High run-on	widespread	**Poor drainage**	not observed
Permanently high watertables	localised	**Permanent waterlogging**	not observed
Seasonal waterlogging	not observed	**Flood hazard**	not observed

Erosion

Wind erosion hazard	not observed	**Wave erosion hazard**	not observed
Gully erosion hazard	localised	**Sheet erosion hazard**	localised
Streambank erosion hazard	not observed		

Salinity

Recharge zone	widespread	**Discharge zone**	localised
Salinity hazard	localised	**Seepage scalds**	localised

FACETS

frw(1)— Upper footslopes

Soils	Deep to very deep, well-drained Red Kandosols (Red Earths).
Type Profile	Soil Landscapes of the Curlewis 1:100 000 Sheet (1000212), profile 27.

frw(2)— Mid to lower footslopes

Soils	Very deep to giant, moderately well-drained Red Chromosols and Sodosols (Red-brown Earths and Solodic soils).
Type Profile	Soil Landscapes of the Curlewis 1:100 000 Sheet (1000212), profile 53.

LAND MANAGEMENT RECOMMENDATIONS

Contour banks and strip cropping is necessary to control sheetflow, especially in cropping systems but also beneficial on steeper upper footslopes in grazing systems. Cropping should be in rotation with pasture, with a maximum of 3 years under crop and a minimum of 3 years in continuous pasture. Tree cover of >10% in stands should be retained or promoted by planting or regeneration.

A buffer strip of native vegetation (planted or regenerated trees or pasture) should be maintained along the plain-footslope/fan boundary to lower locally high watertables and thereby reduce dryland salinity hazard.

Subsoil materials are generally unsuitable for earthworks, as some are susceptible to tunnelling or piping whilst others are highly expansive. Likewise some subsoils may provide difficulties in designing and constructing buildings, footings and drainage systems.

NOTES

(1) This report describes soil landscape information mapped at 1:100,000 scale and does not negate the need for site assessment at a scale suitable to the land use or development under consideration.

(2) 'Not observed' means unlikely to be found. 'Localised' means observed to a level considered significant for land management. 'Widespread' means prevalent and significant over most of the landscape. 'None recorded' means no

occurrence has been recorded. 'Not assessed' means no result has been recorded for this attribute and it may or may not be present in the soil landscape.

APPENDIX G

BUSHFIRE PRONE LAND SEARCH RESULTS

Stewart Surveys Pty Ltd
ABN 65 002 886 508

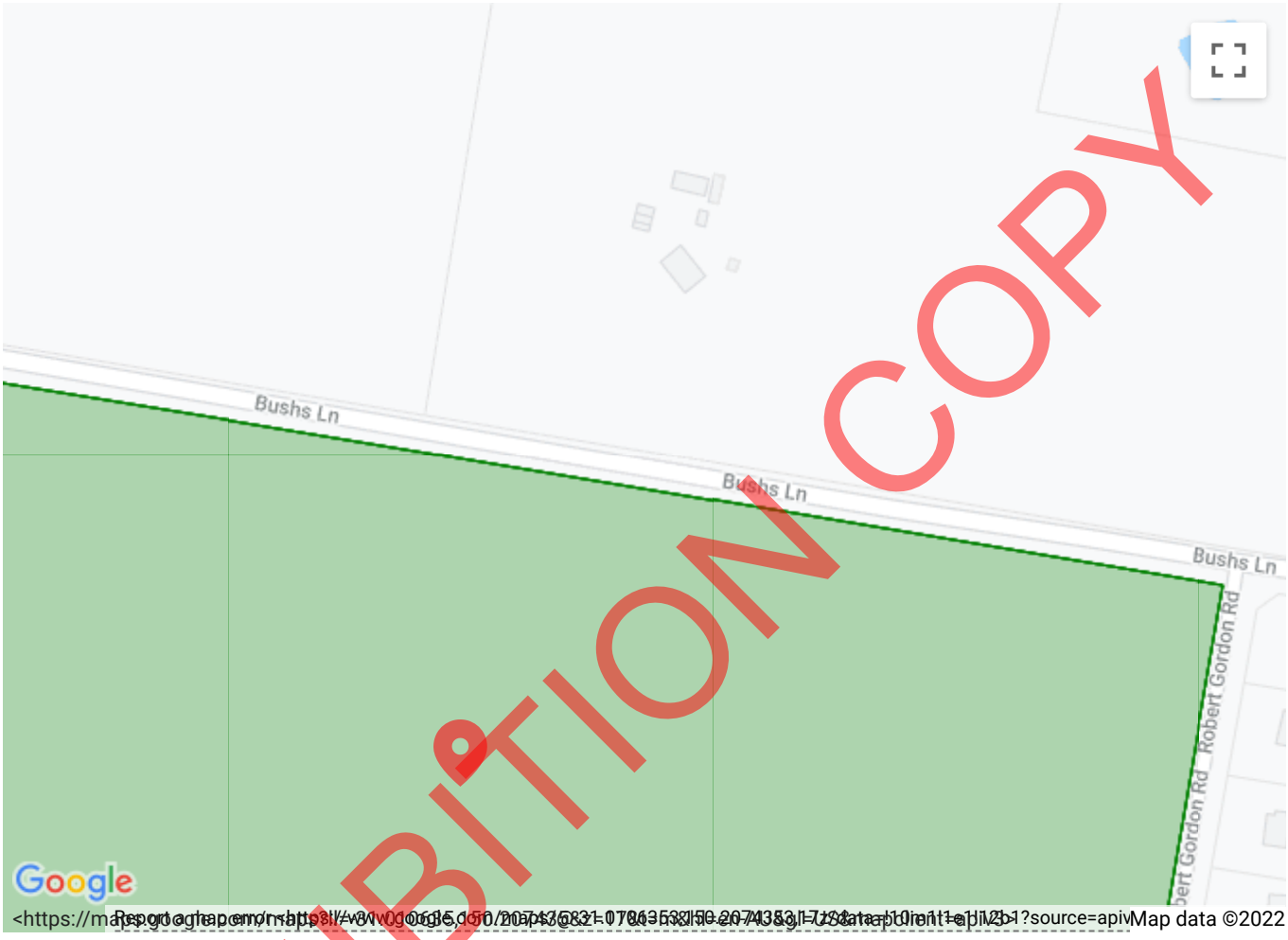
109 Conadilly Street
PO Box 592
Gunnedah NSW 2380

T 02 6742 2966
F 02 6742 0684
cstewart@stewartsurveys.com

NSW RURAL FIRE SERVICE

Check if you're in bush fire prone land

Your Property



Your search result

You have conducted a search of the online bush fire prone land tool for the land in the map above. This search result is valid for the date the search was conducted. If you have any questions about the Bush Fire Prone Land Tool please contact bushfireprone.mapping@rfs.nsw.gov.au

The parcel of land selected is not identified as bush fire prone however you could still be affected by a bush fire.

Think about where you work, travel or holiday. These areas may be at risk of a bush fire.

Remember, discuss with your family about what to do if a bush fire were to happen near you. It may save your life, your community and your family.

For more information on making a plan for bush fire check out our guide to making your bush fire survival plan <https://www.rfs.nsw.gov.au/plan-and-prepare/bush-fire-survival-plan> .

The NSW RFS provides extensive information and resources to assist people interested in preparing their homes and families against the risk of bush fires. Try some of the useful links below for more information:

- Download a guide to making your bush fire survival plan
- Download the Bush Fire and Your Home fact sheet
- Download the Prepare. Act. Survive fact sheet
- Visit our Farm Fire Safety page

New Search Print

APPENDIX H

BIONET ATLAS SEARCH RESULTS – THREATENED FAUNA SPECIES LIST

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Data from the BioNet Atlas website, which holds records from a number of custodians. The data are only indicative and cannot be considered a comprehensive inventory, and may contain errors and omissions. Species listed under the Sensitive Species Data Policy may have their locations denatured (^ rounded to 0.1°C; ^^ rounded to 0.01°C. Copyright the State of NSW through the Department of Planning, Industry and Environment. Search criteria : Public Report of all Valid Records of Animals in selected area [North: -30.96 West: 150.16 East: 150.26 South: -31.06] returned a total of 1,473 records of 215 species.
Report generated on 10/12/2021 10:24 AM

Kingdom	Class	Family	Species Code	Scientific Name	Exotic	Common Name	NSW status	Comm. status	Records	Info
Animalia	Amphibia	Hylidae	3171	*Litoria caerulea*		Green Tree Frog	P		6	
Animalia	Amphibia	Hylidae	3210	*Litoria rubella*		Desert Tree Frog	P		3	
Animalia	Amphibia	Limnodynastidae	3098	*Notaden bennettii*		Crucifix Frog	P		1	
Animalia	Reptilia	Chelidae	5259	*Chelodina expansa*		Broad-shelled Turtle	P		2	
Animalia	Reptilia	Chelidae	2017	*Chelodina longicollis*		Eastern Snake-necked Turtle	P		9	
Animalia	Reptilia	Chelidae	2034	*Emydura macquarii*		Macquarie Turtle	P		2	
Animalia	Reptilia	Carphodactylidae	2139	*Uvidicolus sphyrurus*		Border Thick-tailed Gecko	V,P	V	1	
Animalia	Reptilia	Diplodactylidae	2123	*Nebulifera robusta*		Robust Velvet Gecko	P		1	
Animalia	Reptilia	Pygopodidae	2144	*Aprasia parapulchella*		Pink-tailed Legless Lizard	V,P	V	1	
Animalia	Reptilia	Pygopodidae	2170	*Lialis burtonis*		Burton's Snake-lizard	P		1	
Animalia	Reptilia	Pygopodidae	2911	*Pygopus schraderi*		Eastern Hooded Scaly-foot	P		1	
Animalia	Reptilia	Scincidae	2331	*Cryptoblepharus virgatus*		Cream-striped Shinning-skink	P		1	
Animalia	Reptilia	Scincidae	2375	*Ctenotus robustus*		Robust Ctenotus	P		2	
Animalia	Reptilia	Scincidae	2386	*Ctenotus taeniolatus*		Copper-tailed Skink	P		1	
Animalia	Reptilia	Scincidae	2429	*Egernia striolata*		Tree Skink	P		2	
Animalia	Reptilia	Scincidae	2450	*Lampropholis delicata*		Dark-flecked Garden Sunskink	P		2	
Animalia	Reptilia	Scincidae	2499	*Lerista punctatovittata*		Eastern Robust Slider	P		1	
Animalia	Reptilia	Scincidae	2419	*Liopholis modesta*		Eastern Ranges Rock-skink	P		1	
Animalia	Reptilia	Scincidae	2519	*Menetia greyii*		Common Dwarf Skink	P		1	
Animalia	Reptilia	Scincidae	2580	*Tiliqua scincoides*		Eastern Blue-tongue	P		1	
Animalia	Reptilia	Agamidae	2194	*Amphibolurus muricatus*		Jacky Lizard	P		1	
Animalia	Reptilia	Agamidae	2177	*Pogona barbata*		Bearded Dragon	P		5	
Animalia	Reptilia	Varanidae	2283	*Varanus varius*		Lace Monitor	P		5	
Animalia	Reptilia	Typhlopidae	2603	*Anilios proximus*		Proximus Blind Snake	P		1	
Animalia	Reptilia	Typhlopidae	2606	*Anilios wiedii*		Brown-snouted Blind Snake	P		1	
Animalia	Reptilia	Elapidae	2711	*Brachyurophis australis*		Coral Snake	P		2	
Animalia	Reptilia	Elapidae	2669	*Furina diadema*		Red-naped Snake	P		2	
Animalia	Reptilia	Elapidae	2675	*Hoplocephalus bitorquatus*		Pale-headed Snake	V,P		1	
Animalia	Reptilia	Elapidae	2692	*Pseudechis guttatus*		Spotted Black Snake	P		2	
Animalia	Reptilia	Elapidae	2693	*Pseudechis porphyriacus*		Red-bellied Black Snake	P		1	
Animalia	Reptilia	Elapidae	9075	*Pseudechis sp.*		Unidentified Black Snake	P		1	
Animalia	Reptilia	Elapidae	2699	*Pseudonaja textilis*		Eastern Brown Snake	P		6	
Animalia	Aves	Phasianidae	0009	*Coturnix pectoralis*		Stubble Quail	P		2	
Animalia	Aves	Anatidae	0211	*Anas gracilis*		Grey Teal	P		1	
Animalia	Aves	Anatidae	0208	*Anas superciliosa*		Pacific Black Duck	P		8	
Animalia	Aves	Anatidae	0217	*Biziura lobata*		Musk Duck	P		1	
Animalia	Aves	Anatidae	0202	*Chenonetta jubata*		Australian Wood Duck	P		7	
Animalia	Aves	Anatidae	0203	*Cygnus atratus*		Black Swan	P		1	
Animalia	Aves	Anatidae	0213	*Malacorhynchus membranaceus*		Pink-eared Duck	P		1	
Animalia	Aves	Anatidae	0216	*Oxyura australis*		Blue-billed Duck	V,P		1	
Animalia	Aves	Podicipedidae	0062	*Poliocephalus poliocephalus*		Hoary-headed Grebe	P		1	
Animalia	Aves	Podicipedidae	0061	*Tachybaptus novaehollandiae*		Australasian Grebe	P		1	
Animalia	Aves	Columbidae	0957	*Columba livia*	*	Rock Dove			4	
Animalia	Aves	Columbidae	0031	*Geopelia cuneata*		Diamond Dove	P		1	
Animalia	Aves	Columbidae	0032	*Geopelia humeralis*		Bar-shouldered Dove	P		5	
Animalia	Aves	Columbidae	9931	*Geopelia striata*		Peaceful Dove	P		5	
Animalia	Aves	Columbidae	0043	*Ocyphaps lophotes*		Crested Pigeon	P		17	
Animalia	Aves	Columbidae	0034	*Phaps chalcoptera*		Common Bronzewing	P		3	
Animalia	Aves	Podargidae	0313	*Podargus strigoides*		Tawny Frogmouth	P		18	
Animalia	Aves	Aegothelidae	0317	*Aegotheles cristatus*		Australian Owlet-nightjar	P		2	
Animalia	Aves	Phalacrocoracidae	0097	*Phalacrocorax sulcirostris*		Little Black Cormorant	P		1	
Animalia	Aves	Ardeidae	0189	*Ardea pacifica*		White-necked Heron	P		1	
Animalia	Aves	Ardeidae	0188	*Egretta novaehollandiae*		White-faced Heron	P		5	

Animalia	Aves	Threskiornithidae	0182	*Platalea flavipes*	Yellow-billed Spoonbill	P		1
Animalia	Aves	Threskiornithidae	0179	*Threskiornis moluccus*	Australian White Ibis	P		2
Animalia	Aves	Threskiornithidae	0180	*Threskiornis spinicollis*	Straw-necked Ibis	P		4
Animalia	Aves	Accipitridae	0221	*Accipiter fasciatus*	Brown Goshawk	P		3
Animalia	Aves	Accipitridae	0224	*Aquila audax*	Wedge-tailed Eagle	P		6
Animalia	Aves	Accipitridae	0218	*Circus assimilis*	Spotted Harrier	V,P		1
Animalia	Aves	Accipitridae	0232	*Elanus axillaris*	Black-shouldered Kite	P		3
Animalia	Aves	Accipitridae	0228	*Haliastur sphenurus*	Whistling Kite	P		3
Animalia	Aves	Accipitridae	0231	*^^Hamirostra melanosternon*	Black-breasted Buzzard	V,P,3		1
Animalia	Aves	Accipitridae	0225	*Hieraaetus morphnoides*	Little Eagle	V,P		5
Animalia	Aves	Accipitridae	0230	*^^Lophoictinia isura*	Square-tailed Kite	V,P,3		1
Animalia	Aves	Accipitridae	0229	*Milvus migrans*	Black Kite	P		2
Animalia	Aves	Falconidae	0239	*Falco berigora*	Brown Falcon	P		1
Animalia	Aves	Falconidae	0240	*Falco cenchroides cenchroides*	Nankeen Kestrel	P		11
Animalia	Aves	Falconidae	0235	*Falco longipennis*	Australian Hobby	P		5
Animalia	Aves	Recurvirostridae	0146	*Himantopus himantopus*	Black-winged Stilt	P		1
Animalia	Aves	Charadriidae	0144	*Elseyornis melanops*	Black-fronted Dotterel	P		1
Animalia	Aves	Charadriidae	0133	*Vanellus miles*	Masked Lapwing	P		6
Animalia	Aves	Scolopacidae	0168	*Gallinago hardwickii*	Latham's Snipe	P	J,K	1
Animalia	Aves	Turnicidae	0014	*Turnix varius*	Painted Button-quail	P		2
Animalia	Aves	Cacatuidae	0269	*Cacatua galerita*	Sulphur-crested Cockatoo	P		31
Animalia	Aves	Cacatuidae	0271	*Cacatua sanguinea*	Little Corella	P		3
Animalia	Aves	Cacatuidae	0273	*Eolophus roseicapilla*	Galah	P		39
Animalia	Aves	Cacatuidae	0274	*Nymphicus hollandicus*	Cockatiel	P		1
Animalia	Aves	Psittacidae	0281	*Alisterus scapularis*	Australian King-Parrot	P		6
Animalia	Aves	Psittacidae	0294	*Barnardius zonarius*	Australian Ringneck	P		2
Animalia	Aves	Psittacidae	0258	*Glossopsitta concinna*	Musk Lorikeet	P		4
Animalia	Aves	Psittacidae	0260	*Glossopsitta pusilla*	Little Lorikeet	V,P		5
Animalia	Aves	Psittacidae	0309	*^^Lathamus discolor*	Swift Parrot	E1,P,3	CE	4
Animalia	Aves	Psittacidae	0302	*^^Neophema pulchella*	Turquoise Parrot	V,P,3		4
Animalia	Aves	Psittacidae	0282	*Platycercus elegans*	Crimson Rosella	P		1
Animalia	Aves	Psittacidae	0288	*Platycercus eximius*	Eastern Rosella	P		15
Animalia	Aves	Psittacidae	T039	*Platycercus sp.*	Unidentified Rosella	P		5
Animalia	Aves	Psittacidae	0295	*Psephotus haematonotus*	Red-rumped Parrot	P		9
Animalia	Aves	Psittacidae	9947	*Trichoglossus haematodus*	Rainbow Lorikeet	P		6
Animalia	Aves	Cuculidae	0338	*Cacomantis flabelliformis*	Fan-tailed Cuckoo	P		1
Animalia	Aves	Cuculidae	0342	*Chalcites basalis*	Horsfield's Bronze-Cuckoo	P		1
Animalia	Aves	Cuculidae	0347	*Eudynamys orientalis*	Eastern Koel	P		1
Animalia	Aves	Cuculidae	0348	*Scythrops novaehollandiae*	Channel-billed Cuckoo	P		2
Animalia	Aves	Strigidae	9922	*Ninox novaeseelandiae*	Southern Boobook	P		6
Animalia	Aves	Tytonidae	9923	*Tyto javanica*	Eastern Barn Owl	P		2
Animalia	Aves	Tytonidae	0250	*^^Tyto novaehollandiae*	Masked Owl	V,P,3		1
Animalia	Aves	Alcedinidae	0322	*Dacelo novaeguineae*	Laughing Kookaburra	P		14
Animalia	Aves	Alcedinidae	0326	*Todiramphus sanctus*	Sacred Kingfisher	P		5
Animalia	Aves	Meropidae	0329	*Merops ornatus*	Rainbow Bee-eater	P		1
Animalia	Aves	Coraciidae	0318	*Eurystomus orientalis*	Dollarbird	P		2
Animalia	Aves	Climacteridae	8127	*Climacteris picumnus victoriae*	Brown Treecreeper (eastern subspecies)	V,P		3
Animalia	Aves	Climacteridae	0558	*Cormobates leucophaea*	White-throated Treecreeper	P		3
Animalia	Aves	Maluridae	0529	*Malurus cyaneus*	Superb Fairy-wren	P		7
Animalia	Aves	Maluridae	0536	*Malurus lamberti*	Variegated Fairy-wren	P		3
Animalia	Aves	Maluridae	0535	*Malurus leucopterus*	White-winged Fairy-wren	P		1
Animalia	Aves	Acanthizidae	0476	*Acanthiza apicalis*	Inland Thornbill	P		1
Animalia	Aves	Acanthizidae	0486	*Acanthiza chrysorrhoa*	Yellow-rumped Thornbill	P		7
Animalia	Aves	Acanthizidae	0470	*Acanthiza lineata*	Striated Thornbill	P		2
Animalia	Aves	Acanthizidae	0471	*Acanthiza nana*	Yellow Thornbill	P		4
Animalia	Aves	Acanthizidae	0475	*Acanthiza pusilla*	Brown Thornbill	P		2
Animalia	Aves	Acanthizidae	0484	*Acanthiza reguloides*	Buff-rumped Thornbill	P		1
Animalia	Aves	Acanthizidae	0481	*Acanthiza uropygialis*	Chestnut-rumped Thornbill	P		2
Animalia	Aves	Acanthizidae	0504	*Chthonicola sagittata*	Speckled Warbler	V,P		8
Animalia	Aves	Acanthizidae	0463	*Gerygone fusca*	Western Gerygone	P		2
Animalia	Aves	Acanthizidae	0465	*Smicrornis brevirostris*	Weebill	P		5

Animalia	Aves	Pardalotidae	0565	*Pardalotus punctatus*		Spotted Pardalote	P		2	
Animalia	Aves	Pardalotidae	0976	*Pardalotus striatus*		Striated Pardalote	P		5	
Animalia	Aves	Meliphagidae	0640	*Acanthagenys rufogularis*		Spiny-cheeked Honeyeater	P		8	
Animalia	Aves	Meliphagidae	0638	*Anthochaera carunculata*		Red Wattlebird	P		1	
Animalia	Aves	Meliphagidae	T210	*Anthochaera sp.*		Unidentified Wattlebird	P		1	
Animalia	Aves	Meliphagidae	0614	*Caligavis chrysops*		Yellow-faced Honeyeater	P		1	
Animalia	Aves	Meliphagidae	0598	*Grantiella picta*		Painted Honeyeater	V,P	V	1	
Animalia	Aves	Meliphagidae	0635	*Manorina flavigula*		Yellow-throated Miner	P		1	
Animalia	Aves	Meliphagidae	0634	*Manorina melanocephala*		Noisy Miner	P		8	
Animalia	Aves	Meliphagidae	0583	*Melithreptus brevirostris*		Brown-headed Honeyeater	P		1	
Animalia	Aves	Meliphagidae	0617	*Nesoptilotis leucotis*		White-eared Honeyeater	P		2	
Animalia	Aves	Meliphagidae	0646	*Philemon citreogularis*		Little Friarbird	P		5	
Animalia	Aves	Meliphagidae	0645	*Philemon corniculatus*		Noisy Friarbird	P		7	
Animalia	Aves	Meliphagidae	0585	*Plectorhyncha lanceolata*		Striped Honeyeater	P		4	
Animalia	Aves	Meliphagidae	0613	*Ptilotula fusca*		Fuscous Honeyeater	P		2	
Animalia	Aves	Meliphagidae	0625	*Ptilotula penicillata*		White-plumed Honeyeater	P		6	
Animalia	Aves	Neosittidae	0549	*Daphoenositta chrysoptera*		Varied Sittella	V,P		1	
Animalia	Aves	Campephagidae	0424	*Coracina novaehollandiae*		Black-faced Cuckoo-shrike	P		10	
Animalia	Aves	Campephagidae	0430	*Lalage sueurii*		White-winged Triller	P		3	
Animalia	Aves	Pachycephalidae	0408	*Colluricincla harmonica*		Grey Shrike-thrush	P		5	
Animalia	Aves	Pachycephalidae	0401	*Pachycephala rufiventris*		Rufous Whistler	P		7	
Animalia	Aves	Artamidae	8519	*Artamus cyanopterus cyanopterus*		Dusky Woodswallow	V,P		4	
Animalia	Aves	Artamidae	0700	*Cracticus nigrogularis*		Pied Butcherbird	P		5	
Animalia	Aves	Artamidae	T022	*Cracticus sp.*		Unidentified Butcherbird	P		2	
Animalia	Aves	Artamidae	0702	*Cracticus torquatus*		Grey Butcherbird	P		5	
Animalia	Aves	Artamidae	0705	*Gymnorhina tibicen*		Australian Magpie	P		35	
Animalia	Aves	Artamidae	0694	*Strepera graculina*		Pied Currawong	P		10	
Animalia	Aves	Rhipiduridae	0361	*Rhipidura albiscapa*		Grey Fantail	P		4	
Animalia	Aves	Rhipiduridae	0364	*Rhipidura leucophrys*		Willie Wagtail	P		11	
Animalia	Aves	Corvidae	0691	*Corvus bennetti*		Little Crow	P		1	
Animalia	Aves	Corvidae	0930	*Corvus coronoides*		Australian Raven	P		8	
Animalia	Aves	Corvidae	9902	*Corvus orru*		Torresian Crow	P		2	
Animalia	Aves	Monarchidae	0415	*Grallina cyanoleuca*		Magpie-lark	P		11	
Animalia	Aves	Monarchidae	9955	*Myiagra inquieta*		Restless Flycatcher	P		2	
Animalia	Aves	Corcoracidae	0693	*Corcorax melanorhamphos*		White-winged Chough	P		3	
Animalia	Aves	Corcoracidae	0675	*Struthidea cinerea*		Apostlebird	P		1	
Animalia	Aves	Petroicidae	0392	*Eopsaltria australis*		Eastern Yellow Robin	P		5	
Animalia	Aves	Petroicidae	0377	*Microeca fascinans*		Jacky Winter	P		3	
Animalia	Aves	Petroicidae	0381	*Petroica goodenovii*		Red-capped Robin	P		1	
Animalia	Aves	Cisticolidae	0525	*Cisticola exilis*		Golden-headed Cisticola	P		1	
Animalia	Aves	Hirundinidae	0358	*Cheramoeca leucosterna*		White-backed Swallow	P		2	
Animalia	Aves	Hirundinidae	0357	*Hirundo neoxena*		Welcome Swallow	P		5	
Animalia	Aves	Hirundinidae	0360	*Petrochelidon ariel*		Fairy Martin	P		2	
Animalia	Aves	Turdidae	0991	*Turdus merula*	*	Eurasian Blackbird			1	
Animalia	Aves	Sturnidae	0998	*Acridotheres tristis*	*	Common Myna			1	
Animalia	Aves	Sturnidae	0999	*Sturnus vulgaris*	*	Common Starling			13	
Animalia	Aves	Zosteropidae	0574	*Zosterops lateralis*		Silvereye	P		7	
Animalia	Aves	Dicaeidae	0564	*Dicaeum hirundinaceum*		Mistletoebird	P		5	
Animalia	Aves	Estrildidae	0655	*Stizoptera bichenovii*		Double-barred Finch	P		9	
Animalia	Aves	Estrildidae	0653	*Taeniopygia guttata*		Zebra Finch	P		1	
Animalia	Aves	Passeridae	0995	*Passer domesticus*	*	House Sparrow			3	
Animalia	Aves	Motacillidae	0647	*Anthus novaeseelandiae*		Australian Pipit	P		5	
Animalia	Mammalia	Ornithorhynchidae	1001	*Ornithorhynchus anatinus*		Platypus	P		5	
Animalia	Mammalia	Tachyglossidae	1003	*Tachyglossus aculeatus*		Short-beaked Echidna	P		67	
Animalia	Mammalia	Dasyuridae	T093	*Antechinus sp.*		Unidentified Antechinus	P		1	
Animalia	Mammalia	Dasyuridae	1008	*Dasyurus maculatus*		Spotted-tailed Quoll	V,P	E	5	
Animalia	Mammalia	Phascolarctidae	1162	*Phascolarctos cinereus*		Koala	V,P	V	337	
Animalia	Mammalia	Vombatidae	1165	*Vombatus ursinus*		Bare-nosed Wombat	P		4	
Animalia	Mammalia	Petauridae	1138	*Petaurus breviceps*		Sugar Glider	P		2	
Animalia	Mammalia	Petauridae	1137	*Petaurus norfolcensis*		Squirrel Glider	V,P		1	

Animalia	Mammalia	Pseudocheiridae	1129	*Pseudocheirus peregrinus*		Common Ringtail Possum	P		4	
Animalia	Mammalia	Phalangeridae	T082	*Trichosurus sp.*		brushtail possum	P		46	
Animalia	Mammalia	Phalangeridae	1113	*Trichosurus vulpecula*		Common Brushtail Possum	P		23	
Animalia	Mammalia	Macropodidae	1265	*Macropus giganteus*		Eastern Grey Kangaroo	P		35	
Animalia	Mammalia	Macropodidae	T085	*Macropus sp.*		kangaroo / wallaby	P		70	
Animalia	Mammalia	Macropodidae	1261	*Notamacropus rufogriseus*		Red-necked Wallaby	P		1	
Animalia	Mammalia	Macropodidae	1266	*Osphranter robustus*		Common Wallaroo	P		6	
Animalia	Mammalia	Macropodidae	1242	*Wallabia bicolor*		Swamp Wallaby	P		1	
Animalia	Mammalia	Pteropodidae	1280	*Pteropus poliocephalus*		Grey-headed Flying-fox	V,P	V	4	
Animalia	Mammalia	Pteropodidae	1281	*Pteropus scapulatus*		Little Red Flying-fox	P		2	
Animalia	Mammalia	Pteropodidae	T087	*Pteropus sp.*		Flying-fox	P		6	
Animalia	Mammalia	Emballonuridae	1321	*Saccolaimus flaviventris*		Yellow-bellied Sheathtail-bat	V,P		3	
Animalia	Mammalia	Molossidae	1324	*Austronomus australis*		White-striped Freetail-bat	P		2	
Animalia	Mammalia	Molossidae	T454	*Molossidae sp.*		unidentified mastiff bat	P		1	
Animalia	Mammalia	Molossidae	1946	*Ozimops petersi*			P		1	
Animalia	Mammalia	Molossidae	1940	*Ozimops planiceps*		South-eastern Free-tailed Bat			3	
Animalia	Mammalia	Molossidae	1938	*Ozimops ridei*		Eastern Free-tailed Bat	P		2	
Animalia	Mammalia	Vespertilionidae	1349	*Chalinolobus gouldii*		Gould's Wattled Bat	P		6	
Animalia	Mammalia	Vespertilionidae	1351	*Chalinolobus morio*		Chocolate Wattled Bat	P		4	
Animalia	Mammalia	Vespertilionidae	1354	*Chalinolobus nigrogriseus*		Hoary Wattled Bat	V,P		1	
Animalia	Mammalia	Vespertilionidae	T315	*Nyctophilus corbeni*		Corben's Long-eared Bat	V,P	V	1	
Animalia	Mammalia	Vespertilionidae	1335	*Nyctophilus geoffroyi*		Lesser Long-eared Bat	P		2	
Animalia	Mammalia	Vespertilionidae	1334	*Nyctophilus gouldi*		Gould's Long-eared Bat	P		1	
Animalia	Mammalia	Vespertilionidae	1364	*Scotorepens balstoni*		Inland Broad-nosed Bat	P		3	
Animalia	Mammalia	Vespertilionidae	1365	*Scotorepens orion*		Eastern Broad-nosed Bat	P		2	
Animalia	Mammalia	Vespertilionidae	1022	*Vespadelus darlingtoni*		Large Forest Bat	P		3	
Animalia	Mammalia	Vespertilionidae	1025	*Vespadelus troughtoni*		Eastern Cave Bat	V,P		29	
Animalia	Mammalia	Vespertilionidae	1379	*Vespadelus vulturnus*		Little Forest Bat	P		2	
Animalia	Mammalia	Muridae	1412	*Mus musculus*	*	House Mouse			2	
Animalia	Mammalia	Muridae	1395	*Rattus fuscipes*		Bush Rat	P		1	
Animalia	Mammalia	Muridae	1408	*Rattus rattus*	*	Black Rat			1	
Animalia	Mammalia	Canidae	1531	*Canis lupus*	*	Dingo, domestic dog			6	
Animalia	Mammalia	Canidae	1532	*Vulpes vulpes*	*	Fox			62	
Animalia	Mammalia	Felidae	1536	*Felis catus*	*	Cat			4	
Animalia	Mammalia	Leporidae	1929	*Lepus capensis occidentalis*			P		4	
Animalia	Mammalia	Leporidae	1510	*Oryctolagus cuniculus*	*	Rabbit			6	
Animalia	Mammalia	Equidae	1512	*Equus caballus*	*	Horse			1	
Animalia	Mammalia	Bovidae	1518	*Bos taurus*	*	European cattle			4	
Animalia	Mammalia	Bovidae	1521	*Capra hircus*	*	Goat			1	
Animalia	Mammalia	Cervidae	9112	*Cervus sp.*	*	Unidentified Deer			5	
Animalia	Unknown	Unknown Fauna	T202	*Microchiroptera suborder*		Unidentified Microbat			5	