ATTACHMENTS

ORDINARY MEETING

Thursday 20 February 2025
1.30PM
Council Chambers

Contents

Environment and Planning - 14 December 2023

ITEM 11.1 **Planning Proposal - Lot 4 DP 1198749 - 18 Boureong Drive, Gunning**

FILE REFERENCE **I23/439**

AUTHOR **Development Control Officer**

ISSUE

At its meeting of 21 October 2021, Council considered and supported a planning proposal to amend the Upper Lachlan Local Environmental Plan 2010. The planning proposal incorporates amending the zone provisions of Lot 4 DP 1198749, 18 Boureong Drive, Gunning from RU4 Primary Production Small Lots zone to RU5 Village zone and reduce the minimum lot size from 10ha to 1,000m2.

To enable the Planning Proposal to proceed, Council is to ensure that its Local Strategic Planning Statement (LSPS) reflects the desired outcome. At its meeting of 16 March 2023, a further report was considered by Council which required additional information be provided and be referred to appropriate Government Agency.

RECOMMENDATION That -

1. Council supports the amendments to the Local Strategic Planning Statement
2. The Council submits the planning proposal for a Gateway Determination to amend the Upper Lachlan Local Environmental Plan 2010 by changing the zone and minimum lot size provisions of Lot 4 DP 1198749 from RU4 Primary Production Small Lots zone to RU5 Village zone and to reduce the minimum lot size from 10Ha to 1000m2.
3. The Council requests the Department of Planning and Environment to authorise Council to exercise delegation of plan making functions in accordance with the Environmental Planning and Assessment Act 1979.
4. The Council notifies the community of the proposed changes to the local environmental plan through appropriate processes at the time.

BACKGROUND

At its meeting of 21 October 2021, Council considered and supported a planning proposal to amend the Upper Lachlan Local Environmental Plan 2010. The planning proposal incorporates amending the zone provisions of Lot 4 DP 1198749, 18 Boureong Drive, Gunning from RU4 Primary Production Small Lots zone to RU5 Village zone and reduce the minimum lot size from 10ha to 1,000m2.

Council resolved:

1. *The Council submit the planning proposal for a Gateway Determination to amend the Upper Lachlan Local Environmental Plan 2010 by changing the zone and minimum lot size provisions of Lot 4 DP 1198749 from RU4 Primary*

Environment and Planning
PLANNING PROPOSAL - LOT 4 DP 1198749 - 18 BOUREONG DRIVE, GUNNING
cont'd

Production Small Lots zone to RU5 Village zone and to reduce the minimum lot size from 10ha to 1,000m2.

2. *The Council requests the Department of Planning Industry and Environment to authorise Council to exercise delegation of plan making functions in accordance with the Environmental Planning and Assessment Act 1979.*
3. *The Council delegate authority to the General Manager to undertake any required changes.*
4. *The Council notify the community of the proposed changes to the local environmental plan through appropriate processes at the time.*

To enable the Planning Proposal to proceed, Council is to ensure that its Local Strategic Planning Statement (LSPS) reflects the desired outcome. At its meeting of 16 March 2023, a further report was considered by Council where Council resolved:

1. *Council not support the amendments to the Local Strategic Planning Statement until:*
   - *The applicant provides further supporting documentation to address the STP buffer zone based on the NSW Water Directorate STP Buffer Zone Land Use Planning guidelines; and*
   - *The additional information be forwarded to the relevant Government Agency for consideration and comment.*
2. *A further report be provided to Council for consideration to amend the Local Strategic Planning Statement on completion of the above actions.*

REPORT

Planning Proposal

The owner submitted the Planning Proposal to amend the zone and the minimum lot size provisions of Lot 4 DP 1198749, 18 Boureong Drive, Gunning, located to the north of the existing village. The following map details Gunning, surrounds and the proposed property.

Figure 1: Gunning and surrounding land use zones (ULSC LEP 2010)

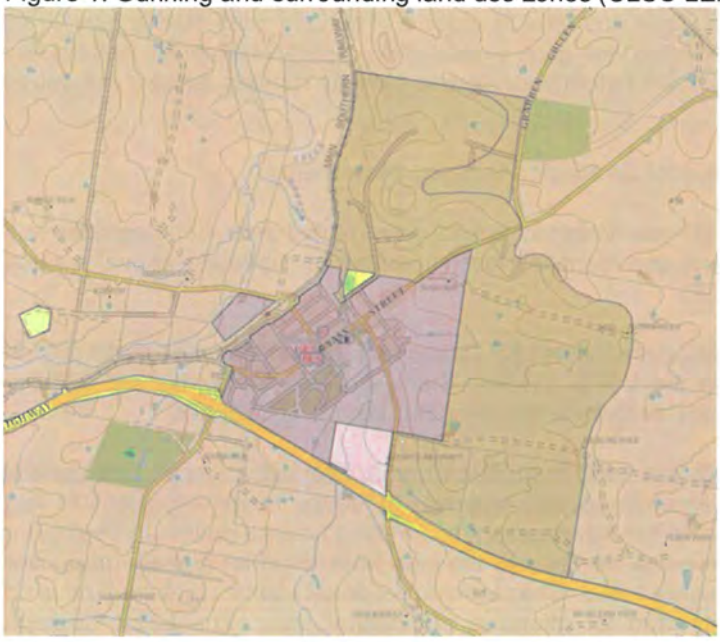
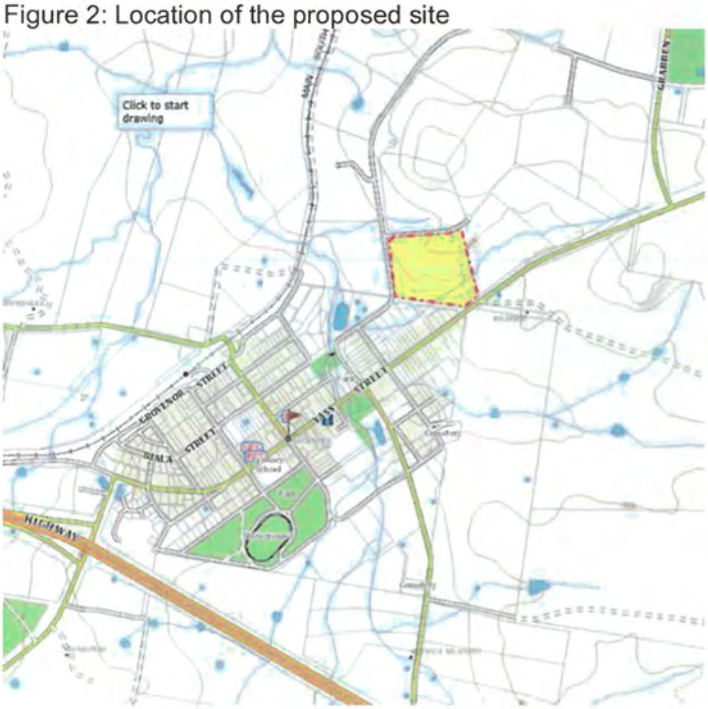


Figure 2: Location of the proposed site



The area is approximately 10 ha, and located immediately north of the town and has good connectivity to the urban and rural hinterland. The land rises quickly away from the village providing properties with good views. The property is relatively well drained but part of it has a large intermittent watercourse or gully running through the south-east corner.

Consistency with the Local Strategic Planning Statements

The LSPS sets out the 20-year vision for a local government area, demonstrates how change will be managed and identifies local priorities for updating council's Local Environmental Plan (LEP).

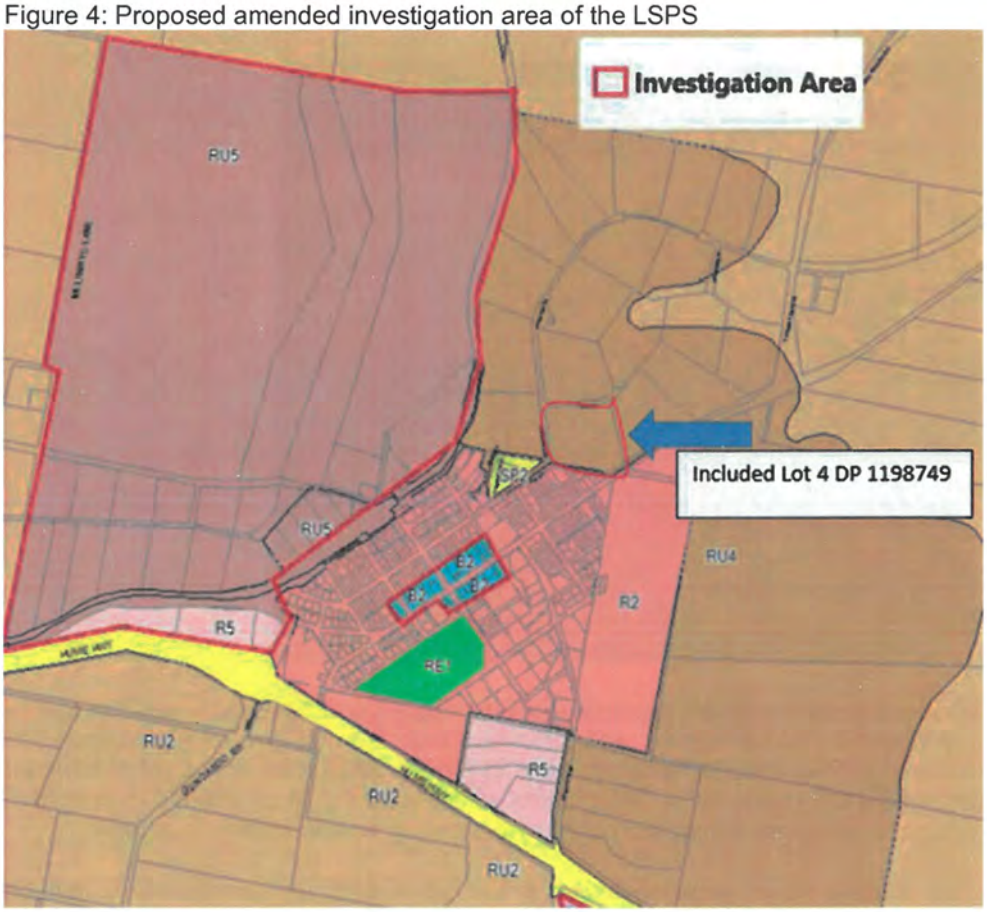
Where there is a proposal to amend its LEP Council is required to ensure that it reflects the direction outlined in the LSPS. Where there are inconsistencies the LSPS is required to be updated to incorporate the amended visions or changes.

The proposal will change the zone from RU4 Primary Production Small Lots zone to RU5 Village zone. The amendment also proposes to reduce the minimum lot size from 10ha to 1,000m2 to enable the development of dwelling houses on lots to be created under the LEP. The proposal will remove the land from small lot primary production intent to large lot village style living. The planning proposal submits that the land is not particularly good quality land for intensive agricultural use. The Local Strategic Planning Statements recommend new urban areas adjacent to existing villages facilitating Council's existing character as a Shire of villages. Lot 4 DP 1198749, 18 Boureong Drive, Gunning is located within the existing settlement area of Gunning and not identified within the investigation area. Therefore, the LSPS is required to be amended to reflect the land identified within the Planning Proposal. The following maps identify the current investigation area for the township of Gunning within the LSPS and the proposed investigation to include Lot 4 DP 1198749 within the investigation area.

Figure 3: Extract of the current investigation area for Gunning

Figure 25 Gunning Investigation Area

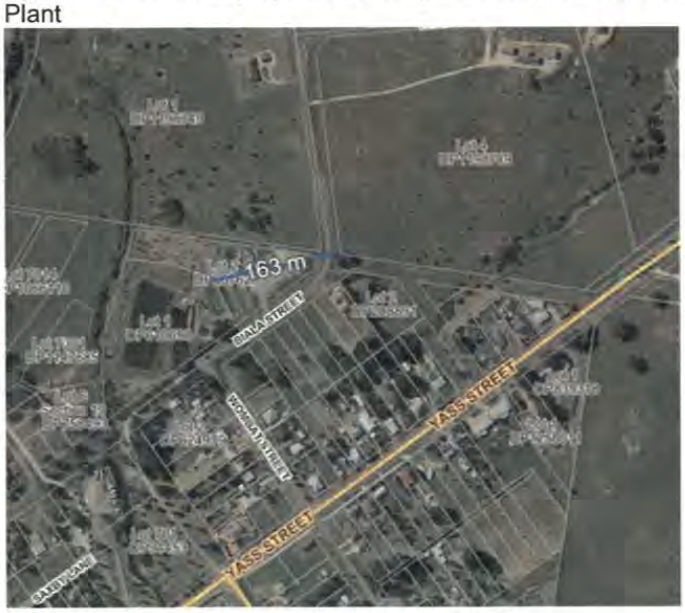
Figure 4: Proposed amended investigation area of the LSPS



Potential implications associated with the Sewage Treatment Plant

As per the detailed Council report dated 16 March 2023, the boundary of the proposed development site is located approximately 160m from Council's existing sewage treatment plant.

Figure 5: Distance of proposed development site from the Gunning Sewage Treatment Plant



As required by the NSW Department of Planning – *Local Environmental Plan Making guidelines* the scoping report was forwarded onto relevant government agencies for comment. This enables these agencies to provide initial feedback, thus allowing the proponent to provide further information where required, in an attempt to ensure all potential issues are addressed prior to the planning proposal being submitted.

The scoping report was forwarded to the NSW EPA for consideration, with the response advising:

'The EPA has reviewed the information provided by ULSC and has identified some concerns regarding the proximity of the proposed residential subdivision to the Gunning Sewage Treatment Plant (GSTP) and Gunning Landfill. These concerns relate primarily to the potential for odour and noise impacts and associated potential conflicts between the sites.

ULSC hold Environment Protection Licence No. 3110 for sewage treatment processing. The licence includes a range of conditions which protect the environment and impacts on sensitive receivers. While this development application is a planning matter for ULSC to assess and determine, the EPA advises that approval of developments (which include sensitive receivers) within proximity of odour generating activities be carefully considered and robustly assessed to ensure the amenity of sensitive receivers are protected and not place the licensee at risk of non-compliance.

Appropriate site selection is key in reducing the potential for conflict between proposed developments and established infrastructure. Project planning should consider the compatibility of the proposal with current and future land uses. Although odour control measures are discussed in the framework, once the land has been developed the range and effectiveness of mitigation measures may be limited. It is therefore important to consider site selection prior to development occurring.'

A copy of the NSW EPA correspondence is included in Attachment 1 for Council's information.

As per the recommendation resolved by Council on 16 March 2023, further supporting documentation was received by the applicant to address the STP buffer zone based on the NSW Water Directorate STP Buffer Zone Land Use Planning guidelines and were forwarded to the NSW Environment Protection Authority (EPA) for further comment and is as follows:

The EPA notes that the application seeks to rezone Lot 4 DP 1198749 from RU4 Primary Production small lots to RU5 Village, for the development of a residential subdivision. The EPA previously identified concerns regarding the proximity of the proposed residential subdivision to the Gunning Sewage Treatment Plant (STP) and the Gunning Landfill. These concerns related primarily to the potential for odour and noise impacts and associated potential conflicts between the sites.

The EPA has received the additional information provided as part of the application and is satisfied that the concerns outlined in the previous letter have been appropriately addressed. Notwithstanding, the EPA holds concerns that the current STP would be unable to accommodate the increased catchment that will occur as a result of this development. The EPA considers that any such increase in catchment area may lead to performance issues (that include the potential emission of offensive odours) at the STP, which would mean that Council may be unable to comply with its statutory obligations under Environment Protection Licence (EPL) no. 3110 and the Protection of the Environment Operations Act 1997. The EPA considers that any activities at the STP must comply with the relevant statutory obligations.

In this regard, Council in reviewing this application should consider the ability of the current STP to accommodate the increase in respective catchment, and the ability of Council to implement any STP upgrades that may be required by the increasing population in the relevant catchment.

NSW EPA advice has been included in attachment 9.

Discussions with Council's Water and Sewer Department have confirmed that the Gunning Sewage Treatment Plant is designed for 1000 equivalent person. It is unknown at the time of the report as to what capacity is available at the Gunning STP. It should be noted that the planning proposal is to amend the zoning and minimum lot size of the lot and if the proposal proceeds, any future development including any proposed subdivision will require the lodgement and determination of a development application.

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PLANNING PROPOSAL - LOT 4 DP 1198749 - 18 BOUREONG DRIVE, GUNNING
cont'd

POLICY IMPACT

Where supported, the proposal will amend the LSPS by changing the zoning and minimum lot size provisions in Gunning.

OPTIONS

The Council may:

- Support the requirement to amend the LSPS based on the proposal;
- Reject the change of minimum lot size and the zone provisions;
- Reject the submission of the planning proposal for a Gateway determination.

FINANCIAL IMPACT OF RECOMMENDATIONS

Nil

RECOMMENDATION That -

1. Council supports the amendments to the Local Strategic Planning Statement
2. The Council submits the planning proposal for a Gateway Determination to amend the Upper Lachlan Local Environmental Plan 2010 by changing the zone and minimum lot size provisions of Lot 4 DP 1198749 from RU4 Primary Production Small Lots zone to RU5 Village zone and to reduce the minimum lot size from 10Ha to 1000m2.
3. The Council requests the Department of Planning and Environment to authorise Council to exercise delegation of plan making functions in accordance with the Environmental Planning and Assessment Act 1979.
4. The Council notifies the community of the proposed changes to the local environmental plan through appropriate processes at the time.

ATTACHMENTS

1.⇩	Planning Proposal - Lot 4 DP 1198749 - 18 Boureong Drive, Gunning - Attachment 01	Attachment
2.⇩	Planning Proposal - Lot 4 DP 1198749 - 18 Boureong Drive, Gunning - Attachment 02	Attachment
3.⇩	Planning Proposal - Lot 4 DP 1198749 - 18 Boureong Drive, Gunning - Attachment 03	Attachment
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5.⇩	Planning Proposal - Lot 4 DP 1198749 - 18 Boureong Drive, Gunning - Attachment 05	Attachment
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8.⇩	Planning Proposal - Lot 4 DP 1198749 - 18 Boureong Drive, Gunning - Attachment 08	Attachment
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UPPER LACHLAN SHIRE COUNCIL

MINUTES OF THE

ORDINARY MEETING OF COUNCIL

HELD IN THE COUNCIL CHAMBERS

ON 14 DECEMBER 2023

REPORTS FROM STAFF AND STANDING COMMITTEES

SECTION 11: ENVIRONMENT AND PLANNING

ITEM 11.1 PLANNING PROPOSAL - LOT 4 DP 1198749 - 18 BOUREONG DRIVE, GUNNING

239/23 ***RESOLVED*** by Cr Searl and Cr Woodbridge

1. Council supports the amendments to the Local Strategic Planning Statement
2. The Council submits the planning proposal for a Gateway Determination to amend the Upper Lachlan Local Environmental Plan 2010 by changing the zone and minimum lot size provisions of Lot 4 DP 1198749 from RU4 Primary Production Small Lots zone to RU5 Village zone and to reduce the minimum lot size from 10Ha to 1000m2.
3. The Council requests the Department of Planning and Environment to authorise Council to exercise delegation of plan making functions in accordance with the Environmental Planning and Assessment Act 1979.
4. The Council notifies the community of the proposed changes to the local environmental plan through appropriate processes at the time.

- CARRIED

Councillors who voted for:- Crs P Kensit, M McDonald, P Culhane, J Marshall, S Reynolds, J Searl and L Woodbridge

Councillors who voted against:- Nil

ITEM 11.3 WILLIS PARK - OFF-LEASH AREA, CROOKWELL

Item dealt with earlier in meeting

Department of Planning, Housing and Infrastructure

Ms Alex Waldren
General Manager
Upper Lachlan Shire Council
PO Box 42
Gunning NSW 2581

Our ref: 545032 IRD24/6567

Dear Ms Waldren

Planning proposal (PP-2024-121) to amend Upper Lachlan Local Environmental Plan 2010

I am writing in response to the planning proposal you have forwarded to the Minister under section 3.34(1) of the Environmental Planning and Assessment Act 1979 (the Act) in respect of the planning proposal to rezone and amend the zoning and lot size for Lot 4 DP 1198749 at 18 Boureong Drive Gunning from RU4 Primary Production Small Lots to RU5 Village, and reduce the minimum lot size from 10 hectares to 1,000 m2.

As delegate of the Minister for Planning and Public Spaces, I have determined that the planning proposal should proceed subject to the conditions in the enclosed gateway determination.

I have also agreed, as delegate of the Secretary, the inconsistency of the planning proposal with applicable directions of the Minister under section 9.1 of the Act 9.1 Rural Zones, and 9.2 Rural Lands, is justified in accordance with the terms of the Direction.

No further approval is required in relation to the Directions.

Considering the nature of the planning proposal I have determined that Council may exercise local plan-making authority functions in relation to the planning proposal.

The proposed local environmental plan (LEP) is to be finalised on or before 28 February 2025. Council should aim to commence the exhibition of the planning proposal as soon as possible.

Parliamentary Counsel's Office is not responsible for the drafting of map-only amendments to LEPs. Requests for legal drafting for map-only amendments must instead be sent to mapinstrument.drafting@dpie.nsw.gov.au. The relevant Department of Planning, Housing and Infrastructure team contact should be copied into the request. The request must include the drafting instruction template, planning proposal and gateway determination.

The NSW Government has committed to reduce the time taken to complete LEPs. To meet these commitments, the Minister may appoint an alternate planning proposal authority if Council does not meet the timeframes outlined in the gateway determination.

The Department's categorisation of planning proposals in the *Local Environmental Plan Making Guideline* (Department of Planning, Housing and Infrastructure, August 2023) is supported by category specific timeframes for satisfaction of conditions and authority and Government agency referrals, consultation, and responses. Compliance with milestones will be monitored by the Department to ensure planning proposals are progressing as required.

Should you have any enquiries about this matter, I have arranged for Ann Martin to assist you. Ms Martin can be contacted on 4247 1826.

Yours sincerely

28/3/2024

Daniel Thompson
Director Southern Region
Local and Regional Planning

Encl: Gateway determination

Department of Planning, Housing and Infrastructure

Gateway Determination

***Planning proposal (Department Ref: PP-2024-121)**:to rezone land and amend the lot size at Lot 4 DP 1198749, 18 Boureong Drive, Gunning from RU4 Primary Production Small lots to RU5 Village and reduce the minimum lot size from 10 hectares to 1,000 m2.*

I, Daniel Thompson the Director, Southern Region at the Department of Planning, Housing and Infrastructure, 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* (the Act) that an amendment to the Upper Lachlan Local Environmental Plan 2010 as described above should proceed subject to the following conditions:

1. 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, 2021) and must be made publicly available for a minimum of 28 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, 2021).

2. 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:

   - Department of Climate Change, Energy, the Environment and Water
   - Transport for NSW
   - State Emergency Services

   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 at least 21 days to comment on the proposal.

3. 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).

4. 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.

5. The LEP should be completed on or before 28 February 2025.

Dated 28th day of March 2024.

Daniel Thompson
Director Southern Region
Local and Regional Planning

Department of Planning, Housing and Infrastructure

Delegate of the Minister for Planning and Public Spaces

PP-2024-121

Laterals

Planning
Engineering & Management
Environmental

PLANNING PROPOSAL

Stuart and Catherine Duke

GUNNING HEIGHTS ESTATE

18 Boureong Drive, Gunning

Lot 4 DP 1198749

January 2024 **Laterals Reference No.: 20022**

Prepared by:
Laterals Planning
1st Floor, 213 Auburn Street
(PO Box 1326) Goulburn NSW 2580
Tel: (02) 4821 0973 Fax: (02) 4822 0777 Email: robert@laterals.com.au

CONTENTS

EXECUTIVE SUMMARY

This Planning Proposal is submitted to the Upper Lachlan Shire Council to rezone and amend the lot size for certain land being:

- Lot 4 DP 1198749 from RU4 Primary Production Small Lots zone to RU5 Village zone and reduce the minimum lot size from 10ha to 1,000m^2 to enable the development of dwelling houses on lots to be created under the *Upper Lachlan Local Environmental Plan 2010* (LEP 2010).

This Planning Proposal has been prepared in accordance with Division 3.4 of the *Environmental Planning and Assessment Act 1979* and the NSW Department of Planning and Environment "A Guide to Preparing Planning Proposals" and addresses the following specific matters in the Guideline and *Environmental Planning and Assessment Act 1979*;

- Part 1 - objectives or intended outcomes;
- Part 2 - explanation of provisions;
- Part 3 - justification;
  - questions to consider when demonstrating the justification;
- Part 4 - Mapping;
- Part 5 - Community consultation;
- Part 6 - Project timeline.

The Planning Proposal demonstrates that there is site specific planning merit and justified by addressing the matters required pursuant to s3.33(2) of the *Environmental Planning and Assessment Act 1979* as well as relevant strategic documents, objectives and actions within the relevant regional and sub-regional strategies, relevant State policies, Ministerial Directions and environmental impacts.

The Planning Proposal was endorsed by the Upper Lachlan Shire Council at its meeting held on the 14 December 2023 and Council resolved that "*The Council submits the planning proposal for a Gateway Determination to amend the Upper Lachlan Local Environmental Plan 2010 by changing the zone and minimum lot size provisions of Lot 4 DP 1198749 from RU4 Primary Production Small Lots zone to RU5 Village zone and to reduce the minimum lot size from 10Ha to 1000m2*." (Copy of the resolution at Annexure 1)

PART 1 – OBJECTIVES

The objective of this Planning Proposal is to rezone and amend the lot size for certain land being:

- Lot 4 DP 1198749 from RU4 Primary Production Small Lots zone to RU5 Village zone and reduce the minimum lot size from 10ha to 1,000m^2 to enable the development of dwelling houses on lots to be created under the *Upper Lachlan Local Environmental Plan 2010* (LEP 2010).

PART 2 - EXPLANATION OF THE PROVISIONS

The proposed outcome will be achieved by an amendment to the *Upper Lachlan Local Environmental Plan 2010* as follows:

(1) Amending Upper Lachlan Land Zoning Maps - Sheets LZN_003C and LZN_003E by rezoning:
- Lot 4 DP 1198749 from RU4 Primary Production Small Lots to RU5 Village.
  See Figure 3 on page 39.

(2) Amending Upper Lachlan LEP 2010 Lot Size Maps – Sheets LSZ_003C and LSZ_003E by including:
- Lot 4 DP 1198749 identified as "U" having a Minimum Lot Size of 1000m^2.
  See Figure 4 on page 40.

PART 3 - JUSTIFICATION

Section A – Need for Planning Proposal

1. Is the planning proposal a result of any strategic study or report?

This planning proposal has been prepared by the property owner in response to the Upper Lachlan 2040 Local Strategic Planning Statement (LSPS) dated June 2020 (to be amended). The planning proposal is consistent with the Statement which identifies the following key actions:

Key Actions: Non-Urban Land:
- Improve biodiversity connectivity and protection.
- Protect and enhance the Indigenous, European, rural and natural landscapes.
- Provide opportunities for housing diversity, off-farm income and green spaces.
- Recognise environmental landscape values as productive elements or recreation elements.
- Identify and protect high-value agricultural land

Key Actions: Urban Land:
- Develop village residential opportunities, and design public places of creativity and innovation.
- Design towns for walking and cycling, promote density and facilitate a mix of collaborative uses.
- Manage and enhance the distinctive character of each village through a master plan.
- Promote arts, culture and nature as part of the urban design framework.
- Lobby and promote the development of rural livability facilities in villages and towns.
- Facilitate villages that are empathetic to the existing agri-scape.
- Provide new space to grow around existing villages and towns and provide for infill opportunities

It is noted that the subject land is not currently included in the investigation area for Gunning, however, Council at its meeting held on the 14 December 2023 resolved that:

- *Council supports the amendments to the Local Strategic Planning Statement* (Copy of resolution at Annexure 1)

This amendment to the LSPS was identified in the report to the Council meeting which states:

> *The LSPS sets out the 20-year vision for a local government area, demonstrates how change will be managed and identifies local priorities for updating council's Local Environmental Plan (LEP). Where there is a proposal to amend its LEP Council is required to ensure that it reflects the direction outlined in the LSPS. Where there are inconsistencies the LSPS is required to be updated to incorporate the amended visions or changes. The proposal will*

change the zone from RU4 Primary Production Small Lots zone to RU5 Village zone. The amendment also proposes to reduce the minimum lot size from 10ha to 1,000m2 to enable the development of dwelling houses on lots to be created under the LEP. The proposal will remove the land from small lot primary production intent to large lot village style living. The planning proposal submits that the land is not particularly good quality land for intensive agricultural use. The Local Strategic Planning Statements recommend new urban areas adjacent to existing villages facilitating Council's existing character as a Shire of villages. Lot 4 DP 1198749, 18 Boureong Drive, Gunning is located within the existing settlement area of Gunning and not identified within the investigation area. Therefore, the LSPS is required to be amended to reflect the land identified within the Planning Proposal. The following maps identify the current investigation area for the township of Gunning within the LSPS and the proposed investigation to include Lot 4 DP 1198749 within the investigation area.

Figure 3: Extract of the current investigation area for Gunning

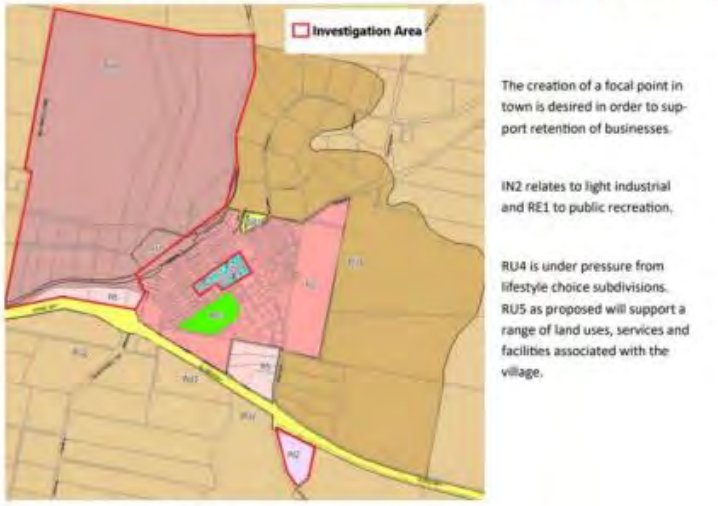
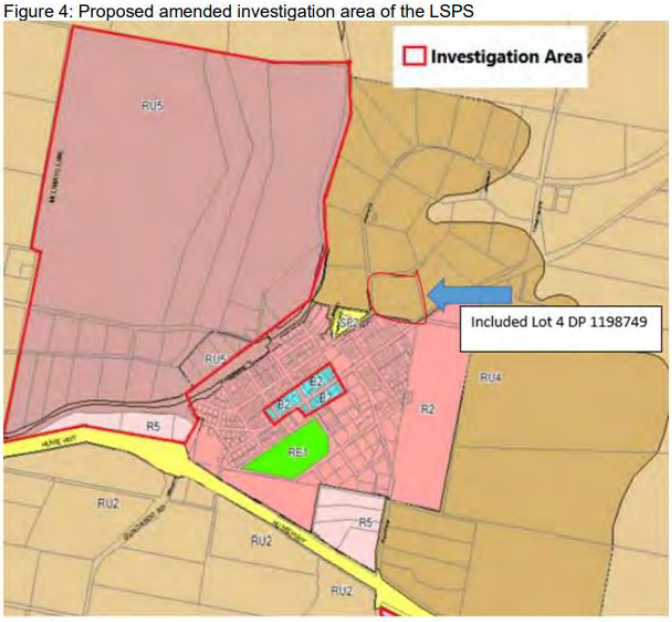


Figure 25 Gunning Investigation Area

Figure 4: Proposed amended investigation area of the LSPS



The Planning Proposal will:

- Provide new opportunities to locate diverse business options.
- Enable businesses to be established.
- Improve biodiversity connectivity and protection.
- Not impact the Indigenous, European, rural and natural landscapes.
- Provide opportunities for housing diversity and green space.
- Enable business opportunities that can add value.
- Not impact high-value agricultural land
- Provide village residential opportunities.
- Zone land for urban diversity.
- Provide new space to grow adjacent to an existing village.

The Planning Proposal will also not further fragment this rural area and it will provide opportunities for diversification and custodianship of the environmental and scenic values.

2. Is the planning proposal the best means of achieving the objectives or intended outcomes, or is there a better way?

It is considered that this planning proposal is the most appropriate means of achieving the proposed minimum lot size and rezoning for the subject land and is seeking this amendment in accordance with Section 3.21(1) of the *Environmental Planning and Assessment Act 1979* which states:

> ***3.21 Review of environmental planning instruments (cf previous s 73)***
>
> *(1) The Planning Secretary shall keep State environmental planning policies and councils shall keep their local environmental plans and development control plans under regular and periodic review for the purpose of ensuring that the objects of this Act are, having regard to such changing circumstances as may be relevant, achieved to the maximum extent possible.*

Section B - Relationship to strategy planning framework

3. Is the planning proposal consistent with the objectives and actions of the applicable regional or sub-regional strategy?

The planning proposal is consistent with the objectives and actions contained within the *Draft South East and Tablelands Regional Plan 2041* and *The Tablelands Regional Community Strategic Plan 2016-2036.*

Draft South East and Tablelands Regional Plan 2041

The Strategy has a vision relevant to the Planning Proposal stating:

The South East and Tablelands Region is valued as a place where people can live, work, and play throughout their lives. By 2041, it is home to just over 350,000 residents (almost 940,000 residents including the ACT). People are attracted to the region's cities, historic towns and villages. The region's landscape - ranging from Australia's highest peaks, to rural and bush covered plains, hinterland areas and dramatic coastlines – offer residents and visitors a diversity of lifestyle opportunities.Productive agricultural land and natural resources are the foundations of the region's economy, which continues to diversify through growth in the tertiary education, health, waste, energy, tourism and transport sectors. AND

New housing and jobs are located to make the best use of infrastructure and services, while considering natural hazards, catering for long term residents and those who relocate from major population centres. AND

As communities grow, this is balanced against measures to enhance the value and protection of a natural environment that enriches lifestyles, sustains the region's water supply and protects biodiversity and productive agricultural land. Strategic planning ensures the enhancement and quality of waterways, flora and fauna, tree canopy and water infiltration.

The Planning Proposal is viewed as consistent with these visions having regard to the following objectives:

Objective 3: Support diverse, vibrant and socially active communities

The objective states "*A sense of belonging and shared values can lift and unite people in challenging times, as we have seen during the COVID-19 pandemic and natural disasters. Meeting and gathering places, pedestrian prioritised streets, events, festivals and cultural infrastructure all enable a sense of belonging as driven by placemaking*." And "*Understanding how communities utilise and interact with social infrastructure is essential to manage growth and change. Several forms of infrastructure and services that are widely recognised to support communities:*

- *playgrounds, libraries, heritage, information and education facilities*
- *busy shopfronts, street verges and community gardens*
- *farmers markets and local produce centres*
- *creative arts centres, theatres, live music and coworking spaces*
- *childcare, healthcare and educational facilities*
- *bushcare groups, outdoor gyms, sportsgrounds, aquatic centres, or community spaces.*

These generate more social opportunities when they can be adapted for different uses, accessed by all community members."

Comment: The expansion of the residential area of Gunning will result in an increase in population which will improve the viability and utilisation of a number of infrastructure items in Gunning generally comprising:

- playgrounds, libraries, heritage and education facilities
- local businesses ▪ farmers markets and local produce centres
- creative arts centres and theatres
- childcare and healthcare facilities
- bushcare groups, sportsgrounds and aquatic centres.

The resultant increase in population at Gunning will revitalise and enhance commercial and retail activity in the existing commercial centre of Gunning and provide positive social and economic benefits to the locality.

Objective 4: Preserve the heritage and character of the region's towns and villages

The objective states "*The region's scenic and cultural landscapes provide unique settings for its urban areas and a strong link to its natural and historic landscapes. Providing opportunities to conserve, interpret and acknowledge the region's heritage values, will build an understanding of history and respect for the experiences of diverse communities. Heritage identification, conservation, management and interpretation can allow heritage places and stories to be experienced by current and future generations*. *Recognising non-Aboriginal heritage must be balanced with the Aboriginal cultural significance of areas – particularly where the celebration of non-Aboriginal heritage has adversely impacted connections to Country, celebration of culture, or represents trauma*."

Comment: An AHIMS search was conducted with buffers of 50m and 200m on the 15 January 2024 with a copy of the results attached at Annexure 7. The search notes there are no Aboriginal sites or artefacts on the subject land. The site of the planning proposal is also remote from the Gunning CBD, is consistent with recent residential development in other areas of Gunning and will not adversely affect the heritage and character of Gunning.

Objective 5: Protect important environmental assets

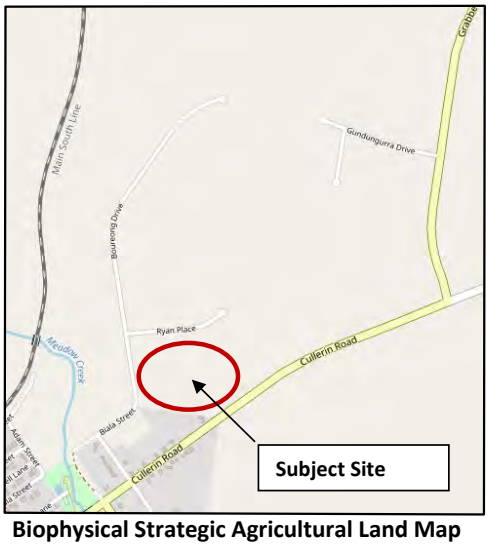
The objective states "*The South East and Tablelands Region includes a variety of landscapes from the Snowy Mountains, the only wilderness coastline in NSW, rural landscapes and national parks. Home to 150 threatened plant species, 144 threatened animal species, 40 endangered ecological communities, and 14 critically endangered ecological communities, the region's planning needs to closely manage and protect the variety and layers of an interconnected ecological system*." And "*Due to historical land clearing and ongoing land management activities post-colonisation, there is a relatively low proportion of native vegetation in parts of the Hilltops and Upper Lachlan LGAs, as well as in the Capital subregion.*"

And "*High environmental value (HEV) lands and the region's network of biodiversity corridors provide diversity and habitat for flora and fauna, including significant koala populations in the Wingecarribee and Snowy Monaro LGAs. To support mapping of HEV lands, additional mapping on High Ecological Aquatic Ecosystems can be found on the SEED portal. Avoiding the impacts on important terrestrial and aquatic habitats and on water quality is a necessary part of planning for the intensification of land uses through urban development and other activities.*"

Comment: The ecological assessment of the subject land undertaken by Macrozamia Environmental Consulting states in the Assessment of Biodiversity Impact:

> *Considering the information detailed above that has been summarised from information collected during field and desktop investigations and assessments of significance for threatened species and communities the following final assessments are made.*
>
> *8.1.Direct Impacts*
>
> *The proposal will result in the 13ha subject site being available to transition from agricultural to residential.*
>
> *8.2.Indirect Impacts*
>
> *Operation of the subject site for residential use will increase traffic on Boureong Drive that may have minor impacts on road strike mortality of fauna. This impact is considered very minor given the low abundance and quality of habitat in the area. As the site transitions to residential landscaping of residential dwellings will increase vegetation diversity. This will result in more animals, particularly birds using the site and be a positive impact on biodiversity.*
>
> *8.3.Potential Impacts on Flora*
>
> *Vegetation impacts will not significantly impact any threatened flora or endangered ecological communities. The proposal will not involve the removal of any significant vegetation, plant habitats or significantly degrade the ecological value of the study area.*
>
> *8.4.Potential Impacts on Fauna and Habitat*
>
> *No areas of important habitat or unique habitat components will be removed as part of this proposal. The impact of the proposal on fauna populations and their habitats is considered likely to be insignificant. No listed threatened fauna or their habitats are considered at risk of impact by this proposal.*

Additionally, the following map indicates that the development site is not identified as strategic agricultural land. As a consequence, the Planning Proposal will not impact the environmental values that apply to the land.



Biophysical Strategic Agricultural Land Map

(Map Source: The Central Resource for Sharing and Enabling Environmental Data in NSW)

Objective 6: Enhance biodiversity, habitats and the connections between them

The objective states "*Regional biodiversity corridors are native vegetation links within a region, between regions or between significant biodiversity features. They expand and link different habitats and are critical to long-term ecological connections, particularly in the context of long-term climate change*." And "*Koala populations have been impacted by drought and the 2019-20 bushfires, which are estimated to have burned 571,568 ha (Figure 10), equating to approximately 26% of the modelled high or very high suitability koala habitat in the region16. Despite this, breeding populations remain, even in significantly affected areas. Areas known to be important to the species need to be carefully managed so that local populations can recover."*

Comment: The ecological assessment of the subject land undertaken by Macrozamia Environmental Consulting states in the Assessment of Biodiversity Impact that "*No areas of important habitat or unique habitat components will be removed as part of this proposal. The impact of the proposal on fauna populations and their habitats is considered likely to be insignificant. No listed threatened fauna or their habitats are considered at risk of impact by this proposal."*

Objective 7: Build resilient places and communities

The objective states "*To build resilient places and communities, risk exposure (shocks and stresses) needs to be understood. Natural hazards, infrastructure and technological failures need to be assessed from a people-centred, cultural, economic, built form and environmental perspective. With a changing climate, communities need the skills and knowledge to effectively respond to change, ensuring they are better placed to prepare for, prevent, respond to and recover from the risks they may experience*."

Comment: All residential development in the area will be located above the PMF flood level and will not be exposed to natural hazards. Building resilient places and communities involves a holistic and collaborative approach that addresses various aspects of social, economic, and environmental well-being which will be incorporated into the development and will include:

- Fostering a sense of ownership and pride within the community.
- Develop and maintain robust infrastructure that can withstand natural disasters, climate change, and other challenges.
- Incorporate sustainable design principles into the development to enhance environmental resilience.
- Use eco-friendly building materials and design practices to reduce the environmental impact of the development.

The proposed development will be environmentally sustainable, socially inclusive, easy to access, healthy and safe and will integrate walking and cycling networks into the design of the development to encourage physical activity and promote energy efficiency.

Objective 8 - Plan for a net zero region by 2050:

The Objective states '*The NSW Government is committed to achieving a 50% emissions reduction by 2030 and net zero emissions by 2050. Net Zero Plan Stage 1: 2020-2030 sets out how it will meet the first stage of this objective over the next decade*.''

Comment: Achieving net-zero emissions in residential development involves implementing sustainable and energy-efficient practices throughout the entire life cycle of the development and the following concepts will be incorporated as appropriate and required:

- Incorporate passive design strategies to optimize natural light, ventilation, and temperature control, reducing the need for artificial heating and cooling.
- Use high-performance insulation and energy-efficient windows to minimize heat loss and gain.
- Install on-site renewable energy sources such as solar panels to generate clean energy.
- Specify and install energy-efficient appliances, lighting, and HVAC (Heating, Ventilation, and Air Conditioning) systems.
- Implement smart home technologies to optimize energy use and reduce waste.

- Choose sustainable and environmentally friendly building materials with low embodied carbon and long life cycles.
- Prioritize materials with high recycled content and those that are easily recyclable at the end of their life.
- Implement water-efficient fixtures and appliances to minimize water consumption.
- Incorporate rainwater harvesting and graywater recycling systems for non-potable water use.
- Encourage and facilitate waste reduction and recycling practices within the residential community.
- Implement composting programs to divert organic waste from landfill.
- Design landscapes with native, drought-tolerant plants to reduce the need for irrigation.

Objective 9 - Secure water resources:
The Objective states '*The State Infrastructure Strategy 2022-2042 identifies the need to improve water security and quality in regional NSW. The future growth and development of the region, coupled with the uncertainties of climate variability and climate change, mean that long-term planning for water supply must be integrated into strategic planning for the region and for adjoining areas including Sydney, which sources a portion its potable water from the northern areas of the region.''*
Comment: The proposed development will be designed to provide a neutral or beneficial effect on water quality and will incorporate water sensitive urban design to minimise the impacts of development on the natural water cycle by protecting natural systems and water quality, integrating stormwater into the landscape, and reducing run off, peak flows and demand for potable water. The subject land is serviced by reticulated water and sewer.

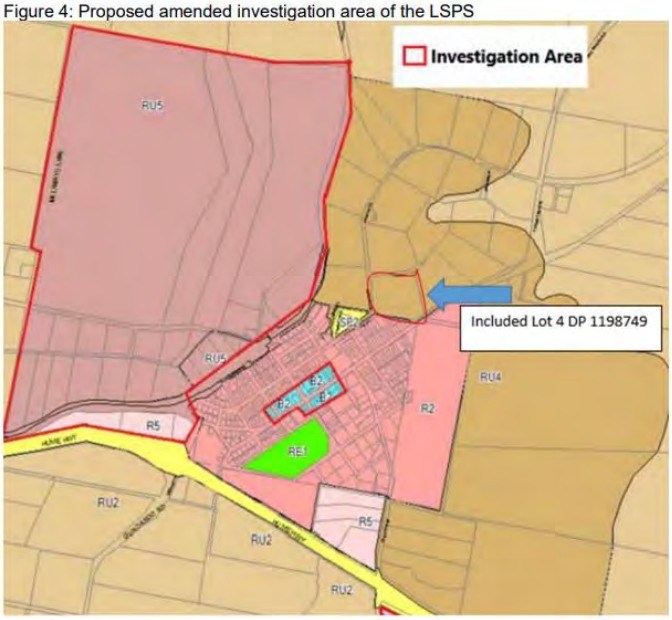
Objective 17: Plan for a supply of housing in appropriate locations
The objective states "*A mix of well-planned infill, greenfield and rural residential development is essential for the region.*" And "*Planning for affordable, quality homes in the right locations also requires planning for greater housing diversity to attract and retain younger residents while supporting people who want to stay in their local area as they get older.*"
Comment: The proposed development site is the subject of a report to the 14 December 2023 meeting of the Upper Lachlan Shire Council which states:

> *The LSPS sets out the 20-year vision for a local government area, demonstrates how change will be managed and identifies local priorities for updating council's Local Environmental Plan (LEP). Where there is a proposal to amend its LEP Council is required to ensure that it reflects the direction outlined in the LSPS. Where there are inconsistencies the LSPS is required to be updated to incorporate the amended visions or changes. The proposal will change the zone from RU4 Primary Production Small Lots zone to RU5 Village zone. The amendment also proposes to reduce the minimum lot size from 10ha to 1,000m2 to enable the development of dwelling houses on lots to be created under the LEP. The proposal will remove the land from small lot primary production intent to large lot village style living. The planning proposal submits that the land is not particularly good quality land for intensive agricultural use. The Local Strategic Planning Statements recommend new urban areas adjacent to existing villages facilitating Council's existing character as a Shire of villages. Lot 4 DP 1198749, 18 Boureong Drive, Gunning is located within the existing settlement area of Gunning and not identified within the investigation area. Therefore, the LSPS is required to be amended to reflect the land identified within the Planning Proposal. The following maps identify the current investigation area for the township of Gunning within the LSPS and the proposed investigation to include Lot 4 DP 1198749 within the investigation area.*

Figure 3: Extract of the current investigation area for Gunning

Figure 25 Gunning Investigation Area

Figure 4: Proposed amended investigation area of the LSPS



Council resolved to support the amendment to the Local Strategic Planning Statement (Copy of resolution at Annexure 1) and the proposed development is located in an appropriate location.

Objective 19 - Improve the quality, resilience and sustainability of housing:
The Objective states *'Urban design has a vital role to play in assisting local governments and communities to respond to the challenges that face the region, and rethink how our built environment can support the health and wellbeing of both people and our environment in a changing climate. We need our cities and towns to develop sustainably and adapt to new technology - to foster new and emerging markets, businesses, jobs, and economic prosperity, and to enable the transition to net zero in the built environment. The Urban Design Guide for Regional NSW provides guidance for creating healthy built environments. Applying this guide can support a place based approach in*

ensuring strategic planning recognises and celebrates the diversity of urban environments, natural landscapes, climates and communities.''

Comment: The proposed development will incorporate residential design guidelines and covenants to ensure the development provides quality, resilient and sustainable housing as indicated above and includes:

- Incorporate passive design strategies to optimize natural light, ventilation, and temperature control, reducing the need for artificial heating and cooling.
- Use high-performance insulation and energy-efficient windows to minimize heat loss and gain.
- Install on-site renewable energy sources such as solar panels to generate clean energy.
- Specify and install energy-efficient appliances, lighting, and HVAC (Heating, Ventilation, and Air Conditioning) systems.
- Implement smart home technologies to optimize energy use and reduce waste.
- Choose sustainable and environmentally friendly building materials with low embodied carbon and long life cycles.
- Prioritize materials with high recycled content and those that are easily recyclable at the end of their life.
- Implement water-efficient fixtures and appliances to minimize water consumption.
- Incorporate rainwater harvesting and graywater recycling systems for non-potable water use.
- Encourage and facilitate waste reduction and recycling practices within the residential community.
- Implement composting programs to divert organic waste from landfill.
- Design landscapes with native, drought-tolerant plants to reduce the need for irrigation.

Objective 20 - Manage rural living:

The Objective states *"Rural lifestyle developments give people the option to live in a semi-rural or urban fringe setting. Local housing strategies identify rural residential housing needs and local supply to understand the infrastructure needed to support rural communities."*

Comment: This proposal satisfies the objective in that the development:

- is close to existing an urban settlement to maximise the efficient use of existing infrastructure and services and social and community infrastructure;
- will avoid and minimise the potential for land use conflicts with productive, zoned agricultural land and natural resources; and
- will avoid areas of high environmental, cultural and heritage significance, important agricultural land and areas affected by natural hazards.

This development maximises the use of existing infrastructure and services and doesn't require new services that would impose excessive costs on Council. The development is on the edge of an existing urban area and supports the Upper Lachlan Council narrative with regard to housing that is responding to demographic changes and housing affordability pressures by allowing a mix of housing types. The additional residents will also help to support existing infrastructure; viz. Memorial hall, school, rural fire service, etc. Managing a rural living effectively requires a combination of practical skills, community engagement, and a mindset that appreciates the slower pace and unique characteristics of rural life and can necessitate the following:

- Learn basic skills such as gardening and basic home repairs to become more self-sufficient.
- Utilise alternative energy sources like solar power,
- Participate in local events, community meetings, and gatherings to build relationships with neighbours.
- Join local clubs, volunteer organizations, or community groups to become an active part of the rural community.
- Understand the specific risks and challenges of rural living, such as natural disasters or limited access to emergency services.

- Create an emergency preparedness plan that includes evacuation routes, communication strategies, and emergency supplies.
- Be mindful of water usage and consider implementing water-saving techniques.
- Explore rainwater harvesting and other sustainable water management practices.
- Identify the location of the nearest healthcare facilities and have a plan for medical emergencies.
- Consider telehealth options for routine check-ups and consultations.
- Participate in local events and festivals to build a sense of belonging.
- Embrace eco-friendly practices, such as composting, recycling, and minimizing waste.
- Consider energy-efficient appliances to reduce environmental impact.
- Engage with neighbours to establish a sense of community security.
- Be prepared for seasonal changes, whether it's extreme weather conditions, agricultural cycles, or wildlife patterns.
- Plan for heating and cooling needs based on seasonal variations.

Managing rural living successfully involves adapting to a different lifestyle and being proactive in addressing the unique challenges that come with rural environments. Building a strong connection with the local community and appreciating the benefits of rural living can contribute to a fulfilling and satisfying experience.

Local Narratives (Upper Lachlan)

The Narrative states "*The Upper Lachlan Local Government Area will see a 36 per cent growth in the number of people aged over 65 by 2036. The area has a population of around 8,000, with Crookwell and Gunning providing a health and medical service, a fire brigade, police services, banking, a post office and retail offerings*" and in respect to housing it states "*Support the rural lifestyle and the unique cultural and historic heritage of the area's villages''* and ''*Support a variety of housing options and land developments to cater for an ageing population.''*

Comment: The Planning Proposal reflects the existing RU5 zone in Gunning by providing low density residential development which is very flexible, will offer a wide range of housing options whilst maintaining the cultural and historic heritage of Gunning.

The Tablelands Regional Community Strategic Plan 2016-2036

The Tablelands Regional Community Strategic Plan 2016-2036 is a joint initiative by Goulburn Mulwaree Council, Upper Lachlan Shire Council and Yass Valley Council to identify the community's regional aspirations via the strategic priorities that achieve the future visions for the region. These include:

- Environment
- Economy
- Community
- Infrastructure
- Civic Leadership

Each relevant strategic pillar is identified below:

Environment:

Strategy EN1 requires ''*Protect and enhance the existing natural environment, including flora and fauna native to the region.''*

The development site as a whole will protect and enhance the existing natural environment including flora and fauna native to the region and will result in the planting of locally sourced native vegetation which will be implemented in accordance with a site specific development control plan.

Strategy EN2 requires ''*Adopt environmental sustainability practices*.''

This development maximises the use of existing infrastructure and services and doesn't require new services and thereby provides an environmentally sustainable development.

Strategy EN3 requires ''*Protect and rehabilitate waterways and catchments*.''

The development will ensure the existing waterway is protected from stock grazing by the erection of riparian fencing which will enable the waterway area to naturally rehabilitate.

Strategy EN4 requires ''*Maintain a balance between growth, development and environmental protection through sensible planning.*''
It is considered that the approach taken to achieve this objective, including consideration of environmental constraints, will maintain the balance between growth, development and the environment.

Economy:
Strategy EC3 requires ''*Support and foster conditions that enable local and small/home-based businesses to grow.*''
This is anticipated by the ample lot size proposed and the location of the site being adjacent to an existing village zone.

Community:
Strategy C05 requires ''*Maintain our rural lifestyle*.''
The Planning Proposal is aimed at achieving this objective by providing large area residential lots adjacent to an urban boundary enabling a rural lifestyle to thrive in the locality.

Infrastructure:
Strategy IN3 requires ''*Maintain and improve road infrastructure and connectivity*.''
There is considered adequate infrastructure in the area to support the proposed residential development. New access roads linking with existing infrastructure will be constructed at the developers cost.

Leadership
Strategy CL4 requires ''*Actively investigate and communicate funding sources and collaboration opportunities that can strengthen the region*.''
The development will contribute funding towards the provision of services throughout the Upper Lachlan Council area in accordance with the Upper Lachlan Development Contributions Plan 2007.

4. Is the planning proposal consistent with a Council's local strategy or other local strategic plan?

(i) Upper Lachlan Shire Local Strategic Planning Statement 2040:

The Planning Proposal is consistent with the Upper Lachlan Shire Local Strategic Planning Statement 2040 (to be amended) and in particular will provide an opportunity for new settlement close to an existing urban centre. Table 1 of the Statement (Upper Lachlan Shire Council Priorities, Principles and Actions) details the future directions for the Council area – see table below.

Table 1 Upper Lachlan Shire Council Priorities, Principles and Actions

Planning Principles	Priority 1 **Non- Urban Land**	Priority 2 **Urban Land**	Priority 3 **Tourism**	Priority 4 **Business Development**
Drivers of Growth and Sustainability	1.1 (a) Promote a diverse agriculture-based economy. (b) Develop an agricultural strategy to provide for value -adding opportunities and succession.	2.1 (a) Develop village residential opportunities. (b) Design public places of creativity and innovation.	3.1 (a) Identify and locate new tourism opportunities. (b) Support tourism as a key sector in the Shire.	4.1 (a) Promote a diversified transitioning economy and provide for small business development. (b) Provide strategic support to entrepreneurs and tourism operators.
Productivity and collaborative diversity	1.2 (a) Plan for diverse agrobusinesses and agricultural land reform. (b) Encourage vertical integration of the rural economy.	2.2 Zone land for mixed-use, aged care and tourism developments and provide for urban diversity.	3.2 Plan for new tourism and destination opportunities as an economic benefit.	4.2 (a) Encourage and support growth in a variety of sectors to enable diversification of the Upper Lachlan economy.

	(c) Improve the diversity of land holding options to promote protection, production and investment.			(b) Promote appropriate smaller-scale renewable energy projects using innovative technologies.
Connectivity, transport and movement	1.3 (a) Improve biodiversity connectivity and protection. (b) Continue to improve road access for commercial opportunities. (c) Improve telecommunications.	2.3 (a) Design towns for walking and cycling, promote density, increase accessibility, and facilitate a mix of collaborative uses. (b) Explore and promote active recreation options for cycling and walking. (c) Promote active transport and explore opportunities to develop an active transport network.	3.3 (a) Continue to improve road access and reuse of alternative transport facilities for destination activity. (b) Encourage cycling and walking opportunities throughout the Shire.	4.3 (a) Promote smart hubs and improve internet access capacity. (b) Promote transport hubs. (c) Promote energy hubs.
Character, Identity, and heritage,	1.4 (a) Protect and enhance the Indigenous, European, rural and natural landscapes. (b) prepare an Aboriginal cultural heritage study.	2.4 Manage and enhance the distinctive character of each village through a master plan. Develop Character Statements for urban development.	3.4 Leverage and celebrate our natural and cultural heritage, climate and natural beauty.	4.4 Reinforce the village town centre small business character and facilitate innovation
Lifestyle and livability	1.5 Provide opportunities for housing diversity and off-farm income to suit changing circumstances.	2.5 Provide new space to grow around existing villages and towns and provide for infill opportunities.	3.5 (a) Conserve and adaptively reuse heritage assets (b) Enhance areas of high environmental value and visual significance.	4.5 Identify the commercial locations and focus points of the villages and structure business growth into them.
Population	1.6 Identify business opportunities that can value add to local business and attract investment and employment.	2.6 Lobby and promote the development of rural livability facilities in villages.	3.6 Plan for increased human and infrastructure capacity in the tourism phenomena and provide new destination activities.	4.6 Plan for increased capacity in various growth sectors and seek value-adding options.
Landscape	1.7 (a) Recognise environmental landscape values as productive or recreation elements. (b) Promote green infrastructure and ecosystem service opportunities. (c) Undertake a biodiversity assessment of the LGA and develop a rural planning strategy	2.7(a) Facilitate villages that are empathetic to the existing agri-scape: small protected bounded spaces. (b) Enhance utilisation of green infrastructure and increase trees.	3.7 (a) Utilise the temperate climate landscape as a place for active recreation opportunities. (b) Identify biodiversity values through landscape assessments to facilitate tourism opportunities.	4.7 Create focal points by siting commercial activities within a mixed-use commercially driven precincts.
Structural Elements	1.8 (a) Identify and protect high-value agricultural land, or land with high	2.8 (a) Provide new space to grow around existing villages and towns and provide for	3.8 Identify tourist-focused locations and provide for their development.	4.8 Identify and develop growth localities close to Canberra, Yass and Goulburn.

	environmental value. (b) Review minimum lot size opportunities to facilitate agrarian investment.	infill opportunities. (b) Lobby for more open spaces, parks, conservation areas, walking and cycling tracks.		

The Planning Proposal is consistent with the directions highlighted in the above table insofar that the development will:

- Improve opportunities to develop village residential opportunities;
- Provide for urban diversity;
- Enable and encourage walking and cycling and promote active recreation options.
- Provide new space to grow around an existing village.
- Recognise the rural landscape as a recreation element and identify the existing waterway as an environmentally sensitive aspect that needs protecting.
- Identify this growth locality being close to Canberra, Yass and Goulburn.

(ii) Upper Lachlan Shire Draft Housing Strategy:

The Upper Lachlan Shire Draft Housing Strategy dated September 2021 includes the following vision in respect to population and housing:

> *"To manage the demand for housing and associated population change in a sustainable way to support a prosperous future for the community of Upper Lachlan while recognising and preserving the particular values, character and liveability of the existing villages and rural areas within the Shire."*

The strategy includes the following details regarding Investigation Areas for Growth:

> *"A number of impediments to infill development within the existing town and village boundaries has been identified, including stringent planning controls which limit development activity and the ability to provide a diverse range of housing. Further, land banking, which is most apparent in or around the towns of Crookwell, Gunning and Grabben Gullen, places further limitations on the ability to expand and develop the towns to accommodate future growth and change. This land banking occurs due to the holding of larger parcels of land without proceeding to develop or due to purchase of multiple lots to meet the minimum lot size to build. Growth in the Shire to 2036 is predicted to be 0.05% per annum to 2036, with a slightly elevated level of growth of 0.08% in Crookwell and 0.36% in Gunning and Dalton. Whilst the number of underdeveloped or vacant lots would be adequate to accommodate this level of growth, this would not make provision for the following:*
>
> - *The lesser level of undeveloped or vacant land in Crookwell which is the major centre of the Shire and which is anticipated to experience a greater level of demand for housing than the outlying villages.*
> - *The higher level of growth in the Gunning to Collector corridor due to the site's high level of access to transport corridors.*
> - *The potential increase in in migration, which is likely to be accelerated following the COVID-19 pandemic. People, in increasing numbers, are seeking to relocate to rural and regional areas in a less dense setting, whilst retaining work from home capability.*
> - *A potential increase in demand which may occur following changes to ULLEP 2010 and which will facilitate land development opportunities and increased housing choice.*
> - *A potential increase in the number of secondary/holiday residences within the*

Shire, which will limit the availability of land for permanent primary residences.

- *Growth in the tourism sector which has the potential to increase employment levels and provide a flow on effect to housing growth.*
- *The availability of land for future development, particularly amalgamated larger holdings, due to land banking in and around the towns.*
- *The desire by some landholders to continue to reside in a low density setting, which reduces infill opportunities.*
- *Land capability and site constraints which may limit the development potential of some land following detailed site specific investigations.*

To address the above limitations, this Strategy has identified 'investigations areas' for the towns and villages. Such 'investigation areas' will ensure that sufficient land is available to accommodate growth in the medium to long term, in the event that growth in the Shire and particularly the priority centres, exceeds conservative population projections. Investigation areas have also been identified for the smaller villages, where supply is not an immediate priority, to ensure that current residents remain and future buyers are incentivised. The 'investigation areas' as shown in Figures 4-9 show the areas where attention should be focused to identify land suitable for future growth surrounding the towns and villages. Any flood affected land should only be investigated for intensive agricultural uses, with associated dwellings on flood free land."
(Pages 16 / 17)

Council, at its meeting held on the 14 December 2023 resolved to support the amendment to the Local Strategic Planning Statement (Copy of resolution at Annexure 1) to include the subject land.

(iii) Upper Lachlan Community Strategic Plan Vision 2023:

The Upper Lachlan Community Strategic Plan Vision 2023 includes the following Vision and Mission Statement:

The Vision for our future is:

To be a diverse local government area that provides various lifestyle, business enterprise, leisure and recreation alternatives, whilst ensuring environmental sustainability, preservation of our history and a sense of belonging in our community.

Mission Statement:

To provide services and facilities to enhance the quality of life and economic viability within the Council area. (Page 14)

This planning proposal is consistent with the Upper Lachlan Community Strategic Plan Vision 2023 insofar that the development will provide for various lifestyle living opportunities whilst ensuring environmental sustainability, preservation of history and a sense of belonging in a community as well as providing services and facilities to enhance the quality of life and economic viability within the Council area. The large lot residential development will provide an opportunity for lifestyle, business enterprise, leisure and recreation alternatives for new residents to the area who will participate in the local community functions and organisations. The identified land does not impact on any historical items and there will be satisfactory environmental safeguards on future residential development with no likelihood that critical habitat or threatened species, populations or ecological communities, or their habitats, will be adversely affected as a result of the proposal.

(iv) Upper Lachlan Local Environmental Plan 2010:

The land is currently zoned RU4 Primary Production Small Lots with the following objectives and land uses:

1 Objectives of zone

- *To enable sustainable primary industry and other compatible land uses.*

- *To encourage and promote diversity and employment opportunities in relation to primary industry enterprises, particularly those that require smaller lots or that are more intensive in nature.*
- *To minimise conflict between land uses within this zone and land uses within adjoining zones.*
- *To protect, manage and restore areas with high conservation, scientific, cultural or aesthetic value.*
- *To retain the significant historic and social values expressed in existing landscapes and land use patterns.*
- *To conserve, link and enhance the quality of potentially valuable environmental assets, including waterways, riparian land, wetlands and other surface and groundwater resources, remnant native vegetation and fauna movement corridors, and to reduce land degradation affecting the assets.*

2 Permitted without consent

Building identification signs; Business identification signs; Environmental protection works; Extensive agriculture; Home-based child care; Home businesses; Home occupations

3 Permitted with consent

Aquaculture; Artisan food and drink industries; Bed and breakfast accommodation; Cellar door premises; Dual occupancies; Dwelling houses; Farm stay accommodation; Garden centres; Home industries; Kiosks; Landscaping material supplies; Plant nurseries; Poultry farms; Roadside stalls; Rural supplies; Rural workers' dwellings; Secondary dwellings; Timber yards; Any other development not specified in item 2 or 4

4 Prohibited

Air transport facilities; Airstrips; Amusement centres; Animal boarding or training establishments; Centre-based child care facilities; Commercial premises; Correctional centres; Crematoria; Depots; Entertainment facilities; Exhibition homes; Exhibition villages; Extractive industries; Freight transport facilities; Health services facilities; Heavy industrial storage establishments; Highway service centres; Home occupations (sex services); Industrial retail outlets; Industrial training facilities; Industries; Intensive livestock agriculture; Mortuaries; Passenger transport facilities; Places of public worship; Recreation facilities (indoor); Recreation facilities (major); Recreation facilities (outdoor); Registered clubs; Residential accommodation; Respite day care centres; Restricted premises; Service stations; Sex services premises; Storage premises; Tourist and visitor accommodation; Transport depots; Truck depots; Vehicle body repair workshops; Vehicle repair stations; Veterinary hospitals; Warehouse or distribution centres; Waste or resource management facilities; Wholesale supplies

The Planning Proposal proposes the subject land to be rezoned to RU5 Village under the Upper Lachlan LEP 2010 and the following zone objectives and land use table will apply:

RU5 Village Zone

1 Objectives of zone

- *To provide for a range of land uses, services and facilities that are associated with a rural village.*
- *To ensure the efficient use of land and infrastructure within each village.*
- *To provide high-amenity residential, commercial, civic and community uses within village areas.*
- *To conserve and enhance buildings and landscape and streetscape features that contribute to the character and identity of village areas.*
- *To conserve, link and enhance the quality of potentially valuable environmental assets, including waterways, riparian land, wetlands and other surface and groundwater*

resources, remnant native vegetation and fauna movement corridors, and to reduce land degradation affecting the assets.

- *To encourage the development of tourism assets and the provision of associated services.*
- *To facilitate a strong and viable village system that provides housing options, business opportunities, adequate transport systems and concentrated community services.*

2 Permitted without consent

Bee keeping; Building identification signs; Business identification signs; Environmental protection works; Home-based child care; Home businesses; Home occupations

3 Permitted with consent

Centre-based child care facilities; Community facilities; Dual occupancies; Dwelling houses; Home industries; Horticulture; Multi dwelling housing; Neighbourhood shops; Oyster aquaculture; Places of public worship; Recreation areas; Recreation facilities (indoor); Recreation facilities (outdoor); Respite day care centres; Schools; Secondary dwellings; Self-storage units; Seniors housing; Shop top housing; Tank-based aquaculture; Any other development not specified in item 2 or 4

4 Prohibited

Agriculture; Air transport facilities; Airstrips; Amusement centres; Animal boarding or training establishments; Boat building and repair facilities; Boat launching ramps; Boat sheds; Cellar door premises; Charter and tourism boating facilities; Correctional centres; Crematoria; Eco-tourist facilities; Electricity generating works; Extractive industries; Farm buildings; Forestry; Freight transport facilities; Funeral homes; Heavy industrial storage establishments; Helipads; Highway service centres; Home occupations (sex services); Industrial retail outlets; Industrial training facilities; Industries; Jetties; Marinas; Mooring pens; Moorings; Mortuaries; Open cut mining; Passenger transport facilities; Recreation facilities (major); Research stations; Residential accommodation; Restricted premises; Roadside stalls; Rural industries; Sewerage systems; Sex services premises; Storage premises; Transport depots; Truck depots; Warehouse or distribution centres; Waste or resource management facilities; Water recreation structures; Water supply systems; Wharf or boating facilities

The objectives of the RU5 Village Zone are examined below:

To provide for a range of land uses, services and facilities that are associated with a rural village.

The proposed development will provide for residential development that is associated with a rural village.

To ensure the orderly and efficient use of land and infrastructure within each village.

The proposed development will ensure the orderly and efficient use of the land and infrastructure within Gunning including water, sewerage, stormwater and public domain infrastructure.

To provide high-amenity residential, commercial, civic and community uses within village areas.

The proposed development will provide high-amenity residential activity and community uses for the village.

To conserve and enhance buildings and landscape and streetscape features that contribute to the character and identity of village areas.

The proposed development will contribute to the character and identity of Gunning by the imposition of appropriate development controls.

To conserve, link and enhance the quality of potentially valuable environmental assets, including waterways, riparian land, wetlands and other surface and groundwater resources, remnant native vegetation and fauna movement corridors, and to reduce land degradation affecting the assets.

The ecological assessment of the subject land undertaken by Macrozamia Environmental Consulting states in the Assessment of Biodiversity Impact that "*No areas of important habitat or*

unique habitat components will be removed as part of this proposal. The impact of the proposal on fauna populations and their habitats is considered likely to be insignificant. No listed threatened fauna or their habitats are considered at risk of impact by this proposal." The proposed development will therefore have no impact.

To encourage the development of tourism assets and the provision of associated services.

The associated increase in population will lead to the development of tourism assets in the area. The development itself is for the purpose of residential development.

To facilitate a strong and viable village system that provides housing options, business opportunities, adequate transport systems and concentrated community services.

The proposed development will contribute to the viability of the village of Gunning and will provide housing options and business opportunities.

5. Is the planning proposal consistent with applicable State Environmental Planning Policies?

The current State Environmental Planning Policies applying to the land are detailed below Source: NSW Planning Portal – 15 January 2024):

SEPP (Biodiversity and Conservation) 2021
SEPP (Exempt and Complying Development Codes) 2008
SEPP (Housing) 2021
SEPP (Industry and Employment) 2021
SEPP (Planning Systems) 2021:
SEPP (Primary Production) 2021
SEPP (Resilience and Hazards) 2021
SEPP (Resources and Energy) 2021
SEPP (Sustainable Buildings) 2022
SEPP (Transport and Infrastructure) 2021
SEPP No 65—Design Quality of Residential Apartment Development:

The applicable State Environmental Planning Policies are highlighted above and are discussed below:

(i) SEPP (Primary Production) 2021:

- Chapter 2 Primary production and rural development

The aims of this Chapter are:

(a) to facilitate the orderly economic use and development of lands for primary production,
(b) to reduce land use conflict and sterilisation of rural land by balancing primary production, residential development and the protection of native vegetation, biodiversity and water resources,
(c) to identify State significant agricultural land for the purpose of ensuring the ongoing viability of agriculture on that land, having regard to social, economic and environmental considerations,
(d) to simplify the regulatory process for smaller-scale low risk artificial waterbodies, and routine maintenance of artificial water supply or drainage, in irrigation areas and districts, and for routine and emergency work in irrigation areas and districts,
(e) to encourage sustainable agriculture, including sustainable aquaculture,
(f) to require consideration of the effects of all proposed development in the State on oyster aquaculture,
(g) to identify aquaculture that is to be treated as designated development using a well-defined and concise development assessment regime based on environment risks associated with site and operational factors.

The following comments are in respect to the above aims:

- The Planning Proposal will not impact on the economic use and development of adjoining lands for primary production.
- The Planning Proposal is located directly adjacent to an existing RU5 Village zone. The Proposal is also consistent with the Upper Lachlan Local Strategic Planning Statement 2010 dated June 2020 and Draft Housing Strategy dated September 2021 which balances primary production and residential development. Native vegetation, biodiversity and water resources will not be adversely impacted.

(ii) SEPP (Transport and Infrastructure) 2021:

- Chapter 2 Infrastructure

The aims of this Chapter are:

(a) improving regulatory certainty and efficiency through a consistent planning regime for infrastructure and the provision of services, and

(b) providing greater flexibility in the location of infrastructure and service facilities, and

(c) allowing for the efficient development, redevelopment or disposal of surplus government owned land, and

(d) identifying the environmental assessment category into which different types of infrastructure and services development fall (including identifying certain development of minimal environmental impact as exempt development), and

(e) identifying matters to be considered in the assessment of development adjacent to particular types of infrastructure development, and

(f) providing for consultation with relevant public authorities about certain development during the assessment process or prior to development commencing, and

(g) providing opportunities for infrastructure to demonstrate good design outcomes.

The policy applies to all local government areas within the state, including Upper Lachlan Shire, and the SEPP requires consultation with Council regarding infrastructure and services and flooding.

6. Is the planning proposal consistent with applicable Ministerial Directions (s.9.1 Directions)?

The following table is a list of Directions issued by the Minister for Planning to relevant planning authorities under Section 9.1 Directions by the Minister (15 January 2024).

Direction	Applies?	Consistency?
Focus area 1: Planning Systems		
1.1 Implementation of Regional Plans	Yes	Yes
1.2 Development of Aboriginal Land Council land	No	N.A.
1.3 Approval and Referral Requirements	Yes	Yes
1.4 Site Specific Provisions	No	N.A.
1.4A Exclusion of Development Standards from Variation	No	N.A.
Focus area 1: Planning Systems - Place-based		
1.5 Parramatta Road Corridor Urban Transformation Strategy	No	N.A.
1.6 Implementation of North West Priority Growth Area Land Use and Infrastructure Implementation Plan	No	N.A.
1.7 Implementation of Greater Parramatta Priority Growth Area Interim Land Use and Infrastructure Implementation Plan	No	N.A.
1.8 Implementation of Wilton Priority Growth Area Interim Land Use and Infrastructure Implementation Plan	No	N.A.
1.9 Implementation of Glenfield to Macarthur Urban Renewal Corridor	No	N.A.

1.10 Implementation of the Western Sydney Aerotropolis Plan	No	N.A.
1.11 Implementation of Bayside West Precincts 2036 Plan	No	N.A.
1.12 Implementation of Planning Principles for the Cooks Cove Precinct	No	N.A.
1.13 Implementation of St Leonards and Crows Nest 2036 Plan	No	N.A.
1.14 Implementation of Greater Macarthur 2040	No	N.A.
1.15 Implementation of the Pyrmont Peninsula Place Strategy	No	N.A.
1.16 North West Rail Link Corridor Strategy	No	N.A.
1.17 Implementation of the Bays West Place Strategy	No	N.A.
1.18 Implementation of the Macquarie Park Innovation Precinct	No	N.A.
1.19 Implementation of the Westmead Place Strategy	No	N.A.
1.20 Implementation of the Camellia-Rosehill Place Strategy	No	N.A.
1.21 Implementation of South West Growth Area Structure Plan	No	N.A.
1.22 Implementation of the Cherrybrook Station Place Strategy	No	N.A.
Focus area 2: Design and Place		
Focus area 3: Biodiversity and Conservation		
3.1 Conservation Zones	No	N.A.
3.2 Heritage Conservation	No	N.A.
3.3 Sydney Drinking Water Catchments	No	N.A.
3.4 Application of C2 and C3 Zones and Environmental Overlays in Far North Coast LEPs	No	N.A.
3.5 Recreation Vehicle Areas	No	N.A.
3.6 Strategic Conservation Planning	No	N.A.
3.7 Public Bushland	No	N.A.
3.8 Willandra Lakes Region	No	N.A.
3.9 Sydney Harbour Foreshores and Waterways Area	No	N.A.
3.10 Water Catchment Protection	No	N.A.
Focus area 4: Resilience and Hazards		
4.1 Flooding	Yes	Yes
4.2 Coastal Management.	No	N.A.
4.3 Planning for Bushfire Protection	Yes	Yes
4.4 Remediation of Contaminated Land	No	N.A.
4.5 Acid Sulfate Soils	No	N.A.
4.6 Mine Subsidence and Unstable Land	No	N.A.
Focus area 5: Transport and Infrastructure		
5.1 Integrating Land Use and Transport	No	N.A.
5.2 Reserving Land for Public Purposes	No	N.A.
5.3 Development Near Regulated Airports and Defence Airfields	No	N.A.
5.4 Shooting Ranges	No	N.A.
Focus area 6: Housing		
6.1 Residential Zones	Yes	Yes
6.2 Caravan Parks and Manufactured Home Estates	No	N.A.
Focus area 7: Industry and Employment		
7.1 Business and Industrial Zones	No	N.A.
7.2 Reduction in non-hosted short-term rental accommodation period	No	N.A.
7.3 Commercial and Retail Development along the Pacific Highway, North Coast	No	N.A.
Focus area 8: Resources and Energy		
8.1 Mining, Petroleum Production and Extractive Industries	No	N.A.
Focus area 9: Primary Production		
9.1 Rural Zones	Yes	Yes
9.2 Rural Lands	Yes	Yes
9.3 Oyster Aquaculture	No	N.A.
9.4 Farmland of State and Regional Significance on the NSW Far North Coast	No	N.A.

The applicable s9.1 Directions (highlighted above) are discussed below:

DIRECTION 1.1: IMPLEMENTATION OF REGIONAL PLANS

Objective

The objective of this direction is to give legal effect to the vision, land use strategy, goals, directions and actions contained in Regional Plans.

Application

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 for Planning.

Direction 1.1

(1) Planning proposals must be consistent with a Regional Plan released by the Minister for Planning.

Consistency

A planning proposal may be inconsistent with the terms of this direction only if the relevant planning authority can satisfy the Planning Secretary (or an officer of the Department nominated by the Secretary), that:

(a) the extent of inconsistency with the Regional Plan is of minor significance, and

(b) the planning proposal achieves the overall intent of the Regional Plan and does not undermine the achievement of the Regional Plan's vision, land use strategy, goals, directions or actions.

Comment:

The planning proposal is consistent with the objectives and actions contained within the Draft South East and Tablelands Regional Plan 2041 and The Tablelands Regional Community Strategic Plan 2016-2036. See Section B, Item 3 above.

DIRECTION 1.3: APPROVAL AND REFERRAL REQUIREMENTS

Objective

The objective of this direction is to ensure that LEP provisions encourage the efficient and appropriate assessment of development.

Application

This direction applies to all relevant planning authorities when preparing a planning proposal.

Direction 1.3

(1) A planning proposal to which this direction applies must:

(a) minimise the inclusion of provisions that require the concurrence, consultation or referral of development applications to a Minister or public authority, and

(b) not contain provisions requiring concurrence, consultation or referral of a Minister or public authority unless the relevant planning authority has obtained the approval of:

i. the appropriate Minister or public authority, and

ii. the Planning Secretary (or an officer of the Department nominated by the Secretary), prior to undertaking community consultation in satisfaction of Schedule 1 to the EP&A Act, and

(c) not identify development as designated development unless the relevant planning authority:

i. can satisfy the Planning Secretary (or an officer of the Department nominated by the Secretary) that the class of development is likely to have a significant impact on the environment, and

ii. has obtained the approval of the Planning Secretary (or an officer of the Department nominated by the Secretary) prior to undertaking community consultation in satisfaction of Schedule 1 to the EP&A Act.

Consistency

A planning proposal must be substantially consistent with the terms of this direction.

Comment:

Future development as a consequence of this Planning Proposal will be subject to the current *Upper Lachlan Local Environmental Plan 2010* provisions

DIRECTION 4.1: FLOODING

Objectives

The objectives of this direction are to:

(a) ensure that development of flood prone land is consistent with the NSW Government's Flood Prone Land Policy and the principles of the Floodplain Development Manual 2005, and

(b) ensure that the provisions of an LEP that apply to flood prone land are commensurate with flood behaviour and includes consideration of the potential flood impacts both on and off the subject land.

Application

This direction applies to all relevant planning authorities that are responsible for flood prone land when preparing a planning proposal that creates, removes or alters a zone or a provision that affects flood prone land.

Direction 4.1

(1) A planning proposal must include provisions that give effect to and are consistent with:

(a) the NSW Flood Prone Land Policy,

(b) the principles of the Floodplain Development Manual 2005,

(c) the Considering flooding in land use planning guideline 2021, and

(d) any adopted flood study and/or floodplain risk management plan prepared in accordance with the principles of the Floodplain Development Manual 2005 and adopted by the relevant council.

(2) A planning proposal must not rezone land within the flood planning area from Recreation, Rural, Special Purpose or Conservation Zones to a Residential, Employment, Mixed Use, W4 Working Waterfront or Special Purpose Zones.

(3) A planning proposal must not contain provisions that apply to the flood planning area which:

(a) permit development in floodway areas,

(b) permit development that will result in significant flood impacts to other properties,

(c) permit development for the purposes of residential accommodation in high hazard areas,

(d) permit a significant increase in the development and/or dwelling density of that land,

(e) permit development for the purpose of centre-based childcare facilities, hostels, boarding houses, group homes, hospitals, residential care facilities, respite day care centres and seniors housing in areas where the occupants of the development cannot effectively evacuate,

(f) permit development to be carried out without development consent except for the purposes of exempt development or agriculture. Dams, drainage canals, levees, still require development consent,

(g) are likely to result in a significantly increased requirement for government spending on emergency management services, flood mitigation and emergency response measures, which can include but are not limited to the provision of road infrastructure, flood mitigation infrastructure and utilities, or

(h) permit hazardous industries or hazardous storage establishments where hazardous materials cannot be effectively contained during the occurrence of a flood event.

(4) A planning proposal must not contain provisions that apply to areas between the flood planning area and probable maximum flood to which Special Flood Considerations apply which:

(a) permit development in floodway areas,

(b) permit development that will result in significant flood impacts to other properties,

(c) permit a significant increase in the dwelling density of that land,

(d) permit the development of centre-based childcare facilities, hostels, boarding houses, group homes, hospitals, residential care facilities, respite day care centres and seniors housing in areas where the occupants of the development cannot effectively evacuate,

(e) are likely to affect the safe occupation of and efficient evacuation of the lot, or

(f) are likely to result in a significantly increased requirement for government spending on emergency management services, and flood mitigation and emergency response measures,

which can include but not limited to road infrastructure, flood mitigation infrastructure and utilities.

(5) For the purposes of preparing a planning proposal, the flood planning area must be consistent with the principles of the Floodplain Development Manual 2005 or as otherwise determined by a Floodplain Risk Management Study or Plan adopted by the relevant council

Consistency

A planning proposal may be inconsistent with this direction only if the planning proposal authority can satisfy the Planning Secretary (or their nominee) that:

(a) the planning proposal is in accordance with a floodplain risk management study or plan adopted by the relevant council in accordance with the principles and guidelines of the Floodplain Development Manual 2005, or

(b) where there is no council adopted floodplain risk management study or plan, the planning proposal is consistent with the flood study adopted by the council prepared in accordance with the principles of the Floodplain Development Manual 2005 or

(c) the planning proposal is supported by a flood and risk impact assessment accepted by the relevant planning authority and is prepared in accordance with the principles of the Floodplain Development Manual 2005 and consistent with the relevant planning authorities' requirements, or

(d) the provisions of the planning proposal that are inconsistent are of minor significance as determined by the relevant planning authority.

Note: In this direction:

(a) "flood prone land" "flood storage" "floodway" and "high hazard" have the same meaning as in the Floodplain Development Manual 2005.

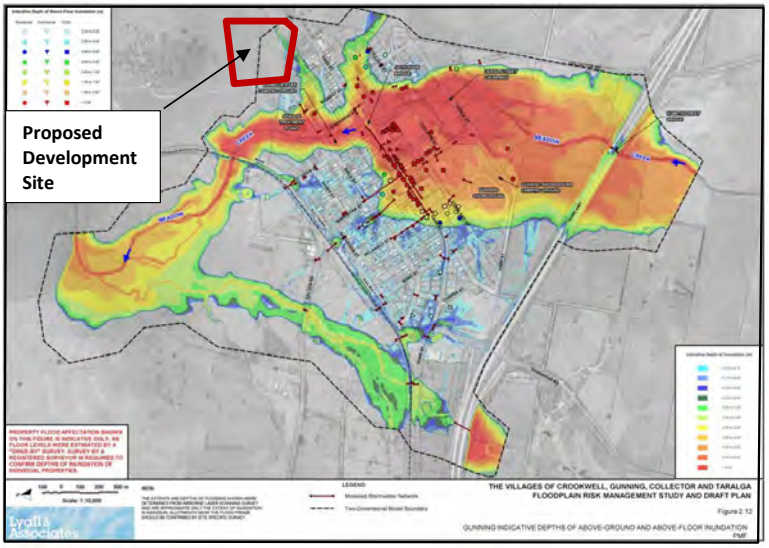
(b) "flood planning level" "flood behaviour" and "flood planning area" has the same meaning as in the Considering flooding in land use planning guideline 2021.

(c) Special flood considerations are outlined in the Considering flooding in land use planning guideline 2021 and an optional clause in the Standard Instrument (Local Environmental Plans) Order 2006.

(d) Under the floodplain risk management process outlined in the NSW Government's Floodplain Development Manual 2005, councils may produce a flood study followed by a floodplain risk management study and floodplain risk management plan.

Comment:

The elevated land associated with this planning proposal located to the northeast of the village is not affected by flooding – see flood inundation plan below.



Gunning Indicative Depths of Above Ground and Above Floor Inundation - PMF

(Map Source: Lyall and Associates Floodplain Risk Management Study and Plan June 2017)

DIRECTION 4.3: PLANNING FOR BUSHFIRE PROTECTION

Objectives

The objectives of this direction are to:

(a) protect life, property and the environment from bush fire hazards, by discouraging the establishment of incompatible land uses in bush fire prone areas, and

(b) encourage sound management of bush fire prone areas.

Application

This direction applies to all local government areas when a relevant planning authority prepares a planning proposal that will affect, or is in proximity to, land mapped as bushfire prone land.

This applies where the relevant planning authority is required to prepare a bush fire prone land map under section 10.3 of the EP&A Act, or, until such a map has been certified by the Commissioner of the NSW Rural Fire Service, a map referred to in Schedule 6 of that Act.

Direction 4.3

(1) In the preparation of a planning proposal the relevant planning authority must consult with the Commissioner of the NSW Rural Fire Service following receipt of a gateway determination under section 3.34 of the Act, and prior to undertaking community consultation in satisfaction of clause 4, Schedule 1 to the EP&A Act, and take into account any comments so made.

(2) A planning proposal must:

(a) have regard to Planning for Bushfire Protection 2019,

(b) introduce controls that avoid placing inappropriate developments in hazardous areas, and

(c) ensure that bushfire hazard reduction is not prohibited within the Asset Protection Zone (APZ).

(3) A planning proposal must, where development is proposed, comply with the following provisions, as appropriate:

(a) provide an Asset Protection Zone (APZ) incorporating at a minimum:

i. an Inner Protection Area bounded by a perimeter road or reserve which circumscribes the hazard side of the land intended for development and has a building line consistent with the incorporation of an APZ, within the property, and

ii. an Outer Protection Area managed for hazard reduction and located on the bushland side of the perimeter road,

(b) for infill development (that is development within an already subdivided area), where an appropriate APZ cannot be achieved, provide for an appropriate performance standard, in consultation with the NSW Rural Fire Service. If the provisions of the planning proposal permit Special Fire Protection Purposes (as defined under section 100B of the Rural Fires Act 1997), the APZ provisions must be

complied with,

(c) contain provisions for two-way access roads which links to perimeter roads and/or to fire trail networks,

(d) contain provisions for adequate water supply for firefighting purposes,

(e) minimise the perimeter of the area of land interfacing the hazard which may be developed,

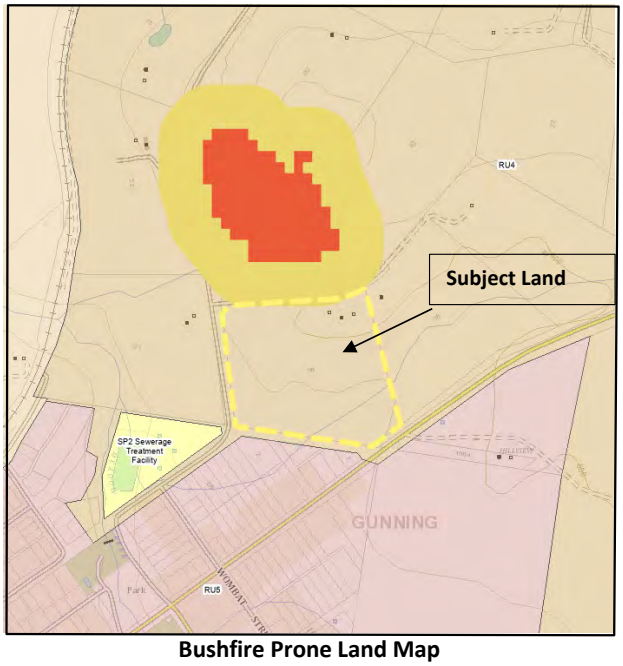
(f) introduce controls on the placement of combustible materials in the Inner Protection Area

Consistency

A planning proposal may be inconsistent with the terms of this direction only if the relevant planning authority can satisfy the Planning Secretary (or an officer of the Department nominated by the Secretary) that the council has obtained written advice from the Commissioner of the NSW Rural Fire Service to the effect that, notwithstanding the non- compliance, the NSW Rural Fire Service does not object to the progression of the planning proposal.

Comment:

The land associated with this planning proposal is not bushfire prone – see plan below.



Bushfire Prone Land Map
(Source: NSW Planning Portal)

DIRECTION 6.1: RESIDENTIAL ZONES

Objectives

The objectives of this direction are to:

(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.

Application

This direction applies to all relevant planning authorities when preparing a planning proposal that will affect land within an existing or proposed residential zone (including the alteration of any existing residential zone boundary), or any other zone in which significant residential development is permitted or proposed to be permitted.

Direction 6.1

(1) A planning proposal must include provisions that encourage the provision of housing that will:

(a) broaden the choice of building types and locations available in the housing market, and

(b) make more efficient use of existing infrastructure and services, and

(c) reduce the consumption of land for housing and associated urban development on the urban fringe, and

(d) be of good design.

(2) A planning proposal must, in relation to land to which this direction applies:

(a) contain a requirement that residential development is not permitted until land is adequately serviced (or arrangements satisfactory to the council, or other appropriate authority, have been made to service it), and

(b) not contain provisions which will reduce the permissible residential density of land.

Consistency

A planning proposal may be inconsistent with the terms of this direction only if the relevant planning authority can satisfy the Planning Secretary (or an officer of the Department nominated by the Secretary) that the provisions of the planning proposal that are inconsistent are:

(a) justified by a strategy approved by the Planning Secretary which:

i. gives consideration to the objective of this direction, and

ii. identifies the land which is the subject of the planning proposal (if the planning proposal relates to a particular site or sites), or

(b) justified by a study prepared in support of the planning proposal which gives consideration to the objective of this direction, or

(c) in accordance with the relevant Regional Strategy, Regional Plan or District Plan prepared by the Department of Planning and Environment which gives consideration to the objective of this direction, or

(d) of minor significance

Comment:

The RU5 zone will allow for a variety of housing types and will have access to existing infrastructure and services in Gunning and is located adjacent to existing residential zoned land.

DIRECTION 9.1: RURAL ZONES

Objective

The objective of this direction is to protect the agricultural production value of rural land.

Application

This direction applies when a relevant planning authority prepares a planning proposal that will affect land within an existing or proposed rural zone (including the alteration of any existing rural zone boundary).

Direction 9.1

(1) A planning proposal must:

(a) not rezone land from a rural zone to a residential, employment, mixed use, SP4 Enterprise, SP5 Metropolitan Centre, W4 Working Waterfront, village or tourist zone.

(b) not contain provisions that will increase the permissible density of land within a rural zone (other than land within an existing town or village).

Consistency

A planning proposal may be inconsistent with the terms of this direction only if the relevant planning authority can satisfy the Planning Secretary (or an officer of the Department nominated by the Secretary that the provisions of the planning proposal that are inconsistent are:

(a) justified by a strategy approved by the Planning Secretary which:

i. gives consideration to the objectives of this direction, and

ii. identifies the land which is the subject of the planning proposal (if the planning proposal relates to a particular site or sites), or

(b) justified by a study prepared in support of the planning proposal which gives consideration to the objectives of this direction, or

(c) in accordance with the relevant Regional Strategy, Regional Plan or District Plan prepared by the Department of Planning and Environment which gives consideration to the objective of this direction, or

(d) is of minor significance

Comment:

The Planning Proposal seeks to rezone some land from a rural zone (RU4) to a residential zone (RU5) and is justified in terms of the minor significance of the proposal and being consistent with the Upper Lachlan 2040 Local Strategic Planning Statement dated June 2020 (to be amended) and Draft Housing Strategy dated September 2021, the Draft South East and Tablelands Regional Plan 2041 and The Tablelands Regional Community Strategic Plan 2016-2036.

DIRECTION 9.2: RURAL LANDS

Objectives

The objectives of this direction are to:

(a) protect the agricultural production value of rural land,

(b) facilitate the orderly and economic use and development of rural lands for rural and related

purposes,

(c) assist in the proper management, development and protection of rural lands to promote the social, economic and environmental welfare of the State,

(d) minimise the potential for land fragmentation and land use conflict in rural areas, particularly between residential and other rural land uses,

(e) encourage sustainable land use practices and ensure the ongoing viability of agriculture on rural land,

(f) support the delivery of the actions outlined in the NSW Right to Farm Policy.

Application

This direction applies when a relevant planning authority prepares a planning proposal for land outside the local government areas of lake Macquarie, Newcastle, Wollongong and LGAs in the Greater Sydney Region (as defined in the Greater Sydney Commission Act 2015) other than Wollondilly and Hawkesbury, that:

(a) will affect land within an existing or proposed rural or conservation zone (including the alteration of any existing rural or conservation zone boundary) or

(b) changes the existing minimum lot size on land within a rural or conservation zone.

Note: Reference to a rural or conservation zone means any of the following zones or their equivalent in a non-Standard LEP: RU1, RU2, RU3, RU4, RU6, C1, C2, C3, C4

Direction 9.2

(1) A planning proposal must:

(a) be consistent with any applicable strategic plan, including regional and district plans endorsed by the Planning Secretary, and any applicable local strategic planning statement

(b) consider the significance of agriculture and primary production to the State and rural communities

(c) identify and protect environmental values, including but not limited to, maintaining biodiversity, the protection of native vegetation, cultural heritage, and the importance of water resources

(d) consider the natural and physical constraints of the land, including but not limited to, topography, size, location, water availability and ground and soil conditions

(e) promote opportunities for investment in productive, diversified, innovative and sustainable rural economic activities

(f) support farmers in exercising their right to farm

(g) prioritise efforts and consider measures to minimise the fragmentation of rural land and reduce the risk of land use conflict, particularly between residential land uses and other rural land use

(h) consider State significant agricultural land identified in chapter 2 of the State Environmental Planning Policy (Primary Production) 2021 for the purpose of ensuring the ongoing viability of this land

(i) consider the social, economic and environmental interests of the community.

(2) A planning proposal that changes the existing minimum lot size on land within a rural or conservation zone must demonstrate that it:

(a) is consistent with the priority of minimising rural land fragmentation and land use conflict, particularly between residential and other rural land uses

(b) will not adversely affect the operation and viability of existing and future rural land uses and related enterprises, including supporting infrastructure and facilities that are essential to rural industries or supply chains

(c) where it is for rural residential purposes:

i. is appropriately located taking account of the availability of human services, utility infrastructure, transport and proximity to existing centres

ii. is necessary taking account of existing and future demand and supply of rural residential land.

Note: where a planning authority seeks to vary an existing minimum lot size within a rural or conservation zone, it must also do so in accordance with the Rural Subdivision Principles in clause

5.16 of the relevant Local Environmental Plan.

Consistency

A planning proposal may be inconsistent with the terms of this direction only if the relevant planning authority can satisfy the Planning Secretary (or an officer of the Department nominated by the Secretary) that the provisions of the planning proposal that are inconsistent are:

(a) justified by a strategy approved by the Planning Secretary and is in force which:

i. gives consideration to the objectives of this direction, and

ii. identifies the land which is the subject of the planning proposal (if the planning proposal relates to a particular site or sites), or

(b) is of minor significance

Comment:

An increase in the permissible density of land is justified in terms of the minor significance of the proposal as detailed below:

- The planning proposal is adjacent to an existing village;
- The proposal is consistent with the Upper Lachlan 2040 Local Strategic Planning Statement dated June 2020 (to be amended) and Draft Housing Strategy dated September 2021;
- The proximity of the subject land to Gunning and adjoining land with a minimum lot size of 1,000m^2 will ensure that the proposal will not result in fragmentation of farm land;
- The proximity of the site to Gunning and adjoining land with minimum lot size of 1,000m^2 ensures the proposal will increase compatibility and minimise any potential for land use conflicts caused by intensive agricultural uses;
- The proximity of the subject land to the Boureong Drive and network of local roads will minimise the potential for land use conflicts;
- The planning proposal will have minimal environmental impact on the local biodiversity and water resources;
- The subject land is adequately serviced in terms of electricity, telecommunications, road network and associated services (e.g. school bus, postal services, health, education, employment, etc.).
- The planning proposal is consistent with the priority of minimising rural land fragmentation and land use conflict, particularly between residential and other rural land uses
- The development will not adversely affect the operation and viability of existing and future rural land uses and related enterprises, including supporting infrastructure and facilities that are essential to rural industries or supply chains.
- The site is appropriately located taking account of the availability of human services, utility infrastructure, transport and proximity to existing centres.
- The development is necessary taking account of existing and future demand and supply of residential land.

Section C - Environmental, Social and Economic Impact

7. ***Is there any likelihood that critical habitat or threatened species, populations or ecological communities, or their habitats, will be adversely affected as a result of the proposal?***

A biodiversity assessment of the subject land has been undertaken by Macrozamia Environmental Consulting and a copy of the assessment dated 29 January 2021 is attached at Annexure 5. This assessment includes the following Assessment of the Biodiversity Impact, Impact Mitigation Measures and Conclusion:

8. Assessment of the Biodiversity Impact

Considering the information detailed above that has been summarised from information collected during field and desktop investigations and assessments of significance for threatened species and communities the following final assessments are made.

8.1. Direct Impacts

The proposal will result in the 13ha subject site being available to transition from agricultural to residential.

8.2. Indirect Impacts

Operation of the subject site for residential use will increase traffic on Boureong Drive that may have minor impacts on road strike mortality of fauna. This impact is considered very minor given the low abundance and quality of habitat in the area.

As the site transitions to residential landscaping of residential dwellings will increase vegetation diversity. This will result in more animals, particularly birds using the site and be a positive impact on biodiversity.

8.3. Potential Impacts on Flora

Vegetation impacts will not significantly impact any threatened flora or endangered ecological communities. The proposal will not involve the removal of any significant vegetation, plant habitats or significantly degrade the ecological value of the study area.

8.4. Potential Impacts on Fauna and Habitat

No areas of important habitat or unique habitat components will be removed as part of this proposal. The impact of the proposal on fauna populations and their habitats is considered likely to be insignificant. No listed threatened fauna or their habitats are considered at risk of impact by this proposal.

9. Impact Mitigation Measures

The following impact mitigation measures are recommended for adoption to reduce the likelihood of any negative impacts on flora and fauna associated with this proposal both in the short and long term.

9.1 Any future Development Application to subdivide Lot 4 DP 1198749 must be accompanied by a Biodiversity Assessment that;

a) Considers the specific design of the proposal &

b) Meets planning requirements for biodiversity current at the time of application

10. Conclusion

This report has assessed the flora and fauna associated with this site and the extent and nature of impacts on biodiversity of the planning proposal.

It is essential that this report's impact mitigation measures be implemented in order to manage potential weed issues on the site and ensure that adjoining areas of high biodiversity value lands are not impacted.

There are no other biodiversity issues associated with this proposal and if the impact mitigation measures recommended by this report are implemented the overall impact of this proposal on flora and fauna will be negligible.

8. Are there any other likely environmental effects as a result of the planning proposal and how are they proposed to be managed?

The subject area is located within the gently undulating and open slopes of an area immediately northeast of Gunning. The area is approx. 250m wide and 350m deep with topography being a sloping landform with a grade of approx. 10%. The NSW Environment and Heritage Land and Soil Capability Mapping defines the study area as generally Class 4 or Class 5 incorporating *"Moderate to severe limitations. Land generally not capable of sustaining high impact land uses unless using specialised management practices with high level of knowledge, expertise, inputs, investment and technology. Limitations are more easily managed for lower impact land uses (e.g. grazing)."* The land is not capable of sustaining high impact land uses and contains a Strahler 1st order watercourse adjacent to the southern boundary of the land. This intermittent watercourse drains to the west to Meadow Creek. The subject land is also located in the general vicinity of the Gunning Sewage Treatment Plant (STP) as indicated on the plan below on page 35. The southwest corner of the land is located approx. 160m from the northeast boundary of the STP site. An Odour Amenity Impact Assessment has been undertaken by SLR Consulting Australia Pty Ltd and a copy of the report dated June 2021 is attached at Annexure 6. This report includes the following conclusion:

''6 Conclusion

In the absence of separation guidelines issued by NSW EPA, a conservative separation distance of 160 m has been adopted for the GSTP using guidelines set by other regulatory agencies in Australia. The Site predominantly lies outside this separation distance, suggesting that there is a low risk of potential adverse amenity impacts on the Site from the GSTP. In addition, prevailing wind conditions suggest that the Site would be downwind of the GSTP very infrequently, .and therefore the likelihood of any odour plume from the GSTP intersecting the Site could be considered unlikely. Based on the above, the risk of odour impacts at the Site is considered low and therefore suitable for sensitive land use as proposed.''

Further advice has been received from SLR Consulting and is detailed below:

(i) Letter to EPA dated 31 May 2022:

A copy of the letter is included at Annexure 6 and includes the following summary:

In summary, SLR considers the OAIA for Lot 4 adequate to demonstrate low risk of land-use conflict due to the following:

- *the small scale and odour potential of GSTP*
- *the separation distance to residences within Lot 4 being greater than the relevant recommended separation distances*
- *the low frequency of wind directions required to promote odour transport from GSTP to Lot 4*
- *the apparent absence of odour nuisance at sensitive receptors closer (and in several cases, within the recommended separation distance) to GSTP and in directions experiencing higher frequencies of wind directions required to promote odour transport from GSTP.*

SLR considers that the OAIA meets the intent of the relevant aspects of the Technical Framework and that the qualitative low-risk outcome indicates that a more detailed assessment (e.g. predictive modelling) is not warranted.

(ii) Letter to Upper Lachlan Shire Council dated 25 May 2023:

A copy of the letter is included at Annexure 6 and includes the following statements:

Being a site-specific assessment, incorporating contingency for a population of 1,000 potentially-affected residents, SLR considers a 160 m separation distance for GSTP to be appropriate. This contrasts with NSW Water Directorate's recommended STP buffer of 400 m, which can be considered a blanket distance, chosen to be conservative with no consideration of the elements listed above.

As presented in Figure 1, attached, a 400 m buffer would encompass existing residences. SLR is not aware of any existing ongoing nuisance issues associated with odour from the existing GSTP activities. This absence of odour- related complaints from the existing residential areas indicates that the facility is achieving acceptable performance with regard to odour emissions. SLR considers that the emission of odour (intensity and character) is not offensive at the distances that existing sensitive receptors are located, as would be expected for a facility of this size, noting that these receptors are both closer to and (as discussed in our 2021 assessment report), downwind of the facility for a significantly greater proportion of the time than the Site. SLR does not consider a 400 m buffer distance to be appropriate in this situation, and indeed believes that imposing such a buffer will unnecessarily sterilise a large area of as yet unrealised land.

In response to Council's request that the buffer zone commence from the boundary of Lot 2 DP607629, a 160 m buffer conservatively assumed to extend from the perimeter of Lot 2 is presented in Figure 2, attached. Note this is conservative as it assumes that the activity boundary is the same as the Lot 2 boundary. This is unlikely to be the case, with any new pondage systems likely to be set in from the site boundary. Nevertheless, this conservative buffer leaves the majority of the Site available for subdivision, for which amendments to the

Local Strategic Planning Statement are now sought.

Additional information was provided to the Upper Lachlan Shire Council by Laterals on the 16 June 2023 regarding the Water Directorate STP Buffer Zone Land Use Planning Guidelines with a copy included at Annexure 6. This advice includes the following statements:

> *"The Water Directorate STP Buffer Zone Land Use Planning Guidelines (June 2020) states that:*
>
> > *In light of the variability of STP conditions and characteristics, it is recognised that a rigid approach to buffer zone planning is not appropriate. Each STP and surrounding environment needs to be assessed individually for effective and appropriate land use to be achieved. (Cl.2.1)*
>
> *The Guidelines also indicate that the 400m buffer distance originates from the former Department of Planning's Circular No. E3 – Guidelines for Buffer Areas Around Sewage Treatment (Water Pollution Control) Plants, March 1989, being a general policy on buffer areas and a strategic tool to broadly guide land use planners in considering public health and amenity issues relating to sewage treatment plants and to avoid inappropriate land use planning. The circular states that:*
>
> > *The circular recommends a minimum buffer distance of 400 metres, while recognising that this may vary according to local conditions. (Cl.3.1.1)*
>
> *This is precisely the approach taken by the SLR Consulting assessment reports."* And
>
> *"The proposed Planning Proposal provides an opportunity for the implementation of Council's Housing Strategy being adjacent to the existing urban area of Gunning which is unaffected by flooding and the site-specific odour assessment undertaken by SLR Consulting stating a buffer distance of 160m which can be implemented from the boundary of Lot 2 DP 607629 will minimise any impact from the Gunning STP."*

Subsequent advice forwarded to the Upper Lachlan Shire Council by the NSW EPA dated 27 October 2023 (copy at Annexure 6) includes the following statement:

> *"The EPA notes that the application seeks to rezone Lot 4 DP 1198749 from RU4 Primary Production small lots to RU5 Village, for the development of a residential subdivision. The EPA previously identified concerns regarding the proximity of the proposed residential subdivision to the Gunning Sewage Treatment Plant (STP) and the Gunning Landfill. These concerns related primarily to the potential for odour and noise impacts and associated potential conflicts between the sites. The EPA has received the additional information provided as part of the application and is satisfied that the concerns outlined in the previous letter have been appropriately addressed."*

All future residential development on the site will be outside the recommended buffer distance – see conceptual development plans at Annexure 8. Also, there is no indication of any site contamination that would cause environmental or health impacts and given the proximity to waste disposal facilities at Gunning would suggest that illegal disposal of waste on the site is highly unlikely. There are no other likely environmental effects as a result of the planning proposal and the proposal is unlikely to have any significant impact on the environment or any adjoining lands.

Lot 4 DP 1198749 and Gunning STP
(Map Source: Six Maps)

9. How has the planning proposal adequately addressed any social and economic effects?

The area has a long history of agricultural use and the planning proposal provides an opportunity to achieve the highest and best use of land with suitable environmental protection measures. The subject land is not identified as a heritage item nor is located in a heritage conservation area and an AHIMS search has been undertaken indicating nil aboriginal sites or places – see Annexure 7. The Upper Lachlan Shire Draft Housing Strategy (October 2019) states that "*Gunning is approximately 50km to the southwest of Crookwell and directly accessible by the Hume Motorway to both Canberra and Sydney, making it a desirable location for tourists from those cities. It is the closest centre to Canberra in the Shire. Gunning is approximately one hour drive to the centre of Canberra. The area was originally occupied by the Gundungurra and Ngunnawal people. In more recent years the area around Gunning has become known for its fine merino wool production. The town was important in Australia's colonial and 19th Century history. Gunning was settled very early in the colonial period, beginning in 1821 with exploration led by Hamilton Hume and in 1824 Hume, famously with William Hovell who charted the route from Gunning south to what was later to become Melbourne. At Fish River, four kilometres east of Gunning, is the commemorative memorial erected in 1924 to mark the hundredth anniversary of the Hume and Hovell expedition. The wide main street, Yass Street, still shows many examples of 19th century architecture, especially the ground floor of the Telegraph Hotel, London House, the post office, the old printery, the old bank, the courthouse and the commercial precinct centred around Caxton House. The built and natural history of the town are important attractions for tourists who come to visit such places as the Royal Hotel Dalton and the prehistoric Fossil Rock. At the 2016 census, Gunning had a population of 600.*"

In respect to social effects, the planning proposal will have a positive effect as the proposed riparian area and a passive recreation area could be utilized to provide a commentary on the history of Gunning. There seems to be considerable demand for properties within commuting distance of the ACT, as high costs of ACT housing push ACT workers into New South Wales. Families looking for a more rural lifestyle may decide that the most affordable way to have a large house on a spacious block will be to live near country towns such as Gunning. The primary school and other community facilities in Gunning are likely to be an attractor for families with young children. Gunning has a great deal of promise to expand as a village offering a more rural residential lifestyle with town benefits to families who need to commute to Canberra for work. The planning proposal will provide for this population and provide a positive economic impact in the Upper Lachlan Council area and particularly in the locality of Gunning.

Section D - State and Commonwealth Interests

10. Is there adequate public infrastructure for the planning proposal?

The study area is adequately serviced in terms of electricity, telecommunications and associated services (e.g. school bus and postal services). The area permits ready access to all the benefits offered by Goulburn, Crookwell and Canberra (e.g. health, education, employment, waste management facilities, recreational and social, etc.) via the classified roads and Hume Highway. The subject land is able to be serviced by the existing Gunning reticulated water supply which is extant along Boureong Drive and Ryan Place. A gravity sewer reticulation network will also be able to service the site. Access to development within the area will be via Yass Street, Wombat Street, Biala Street and Boureong Drive being under the care and control of the Upper Lachlan Shire Council. The upgrading of road infrastructure and any additional public roads will be at the expense of the developer.

11. What are the views of State and Commonwealth public authorities consulted in accordance with the gateway determination?

Any requirement to consult State and Commonwealth public authorities, as advised by the Department, will be undertaken in accordance with the relevant community consultation requirements.

PART4-MAPPING

The following maps are included as part of the Planning Proposal:

Figure 1	The current Land Use Zone applying to the land.
Figure 2	The current Minimum Lot Sizes relating to the land.
Figure 3	The proposed amendment to Upper Lachlan Land Zoning Map.
Figure 4	The proposed Minimum Lot Size to apply to the land.

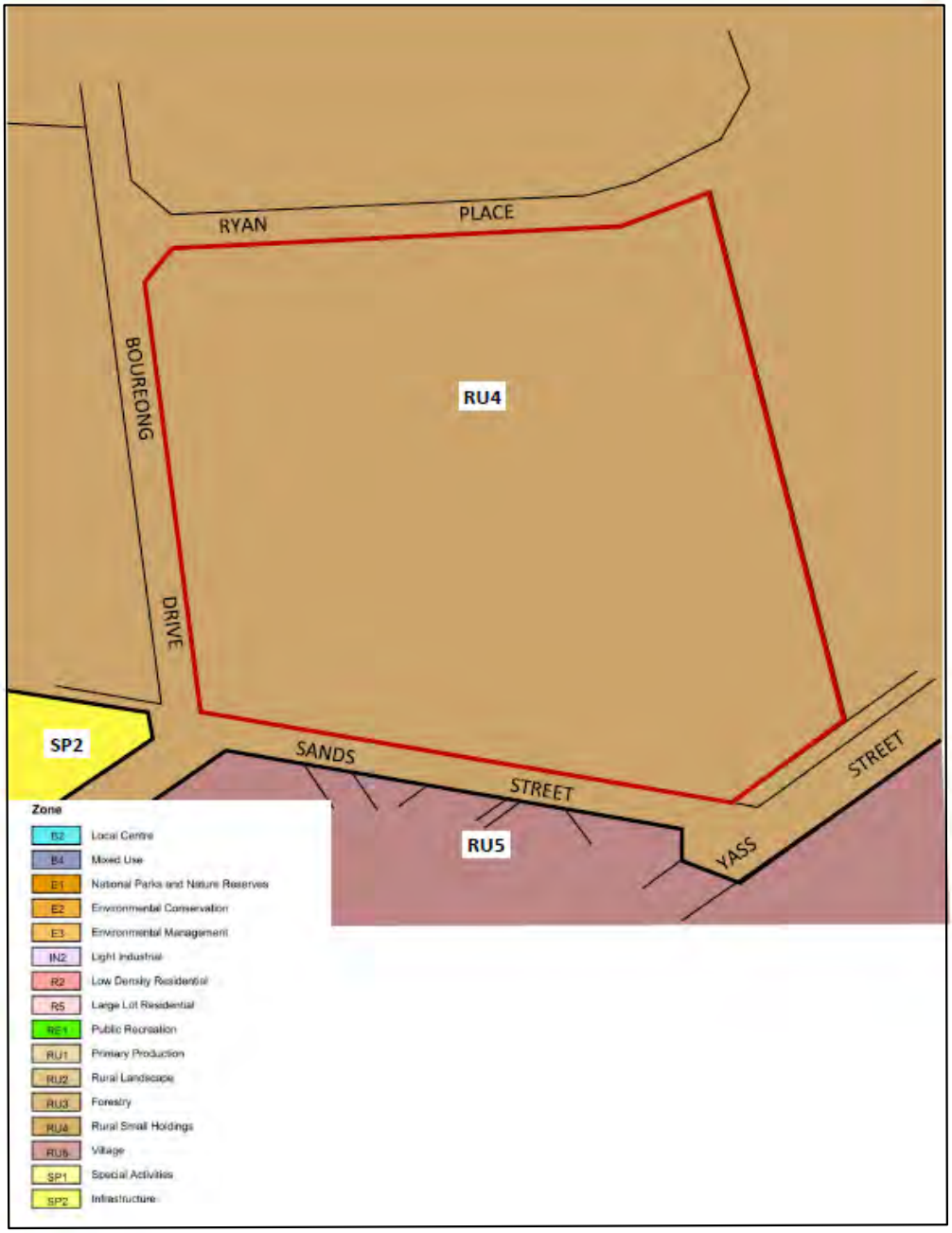


Figure 1: The current Land Use Zone applying to the land
Zone RU4 Primary Production Small Lots
(Land Zoning Map – Sheets LZN_003C and LZN_003E)
Upper Lachlan Local Environmental Plan 2010
(Map Source: NSW Legislation website)

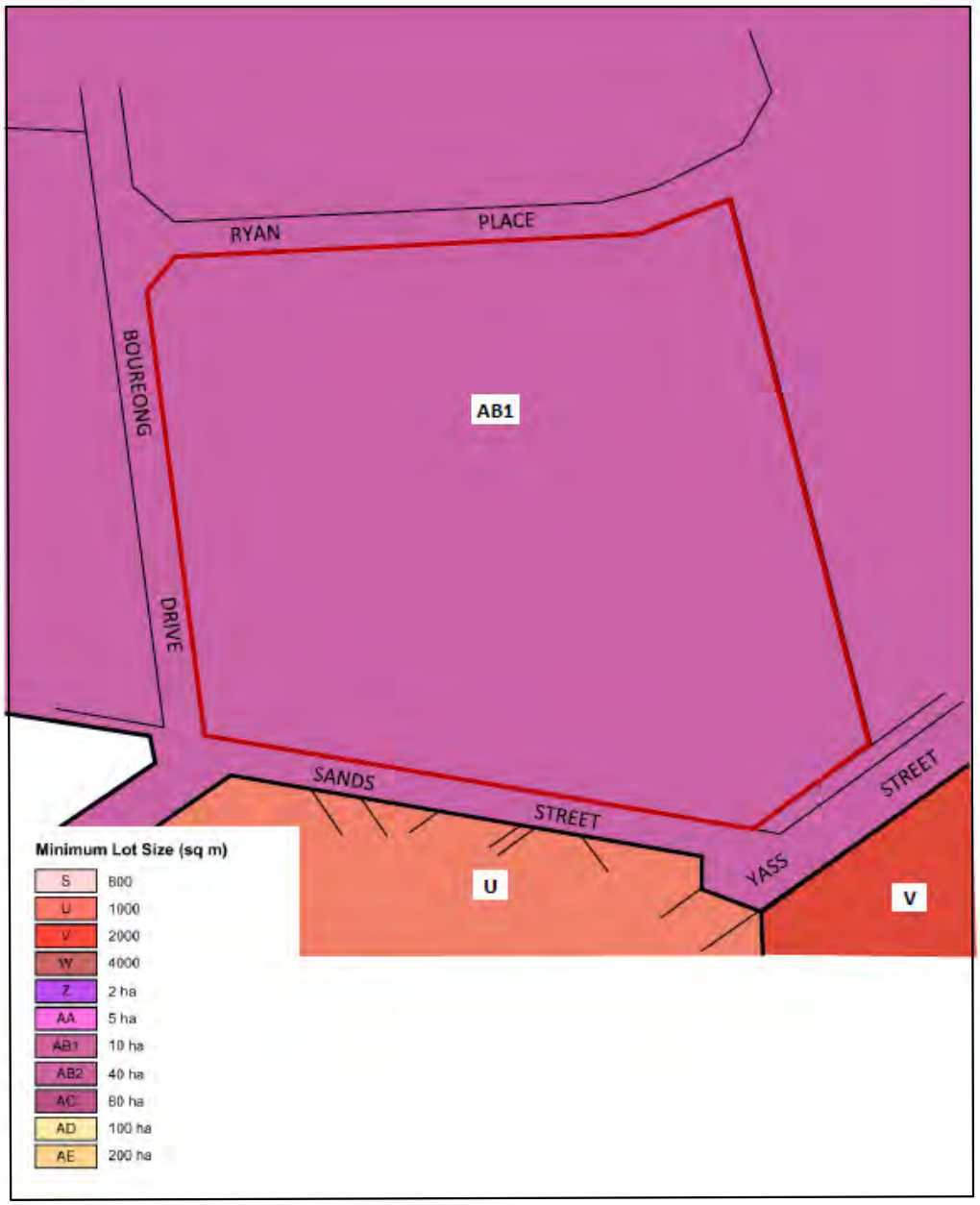


Figure 2: The current Minimum Lot Sizes relating to the land
AB1 – 10ha
(Lot Size Map - Sheets LSZ_003C and LSZ_003E)
Upper Lachlan Local Environmental Plan 2010
(Map Source: NSW Legislation website)

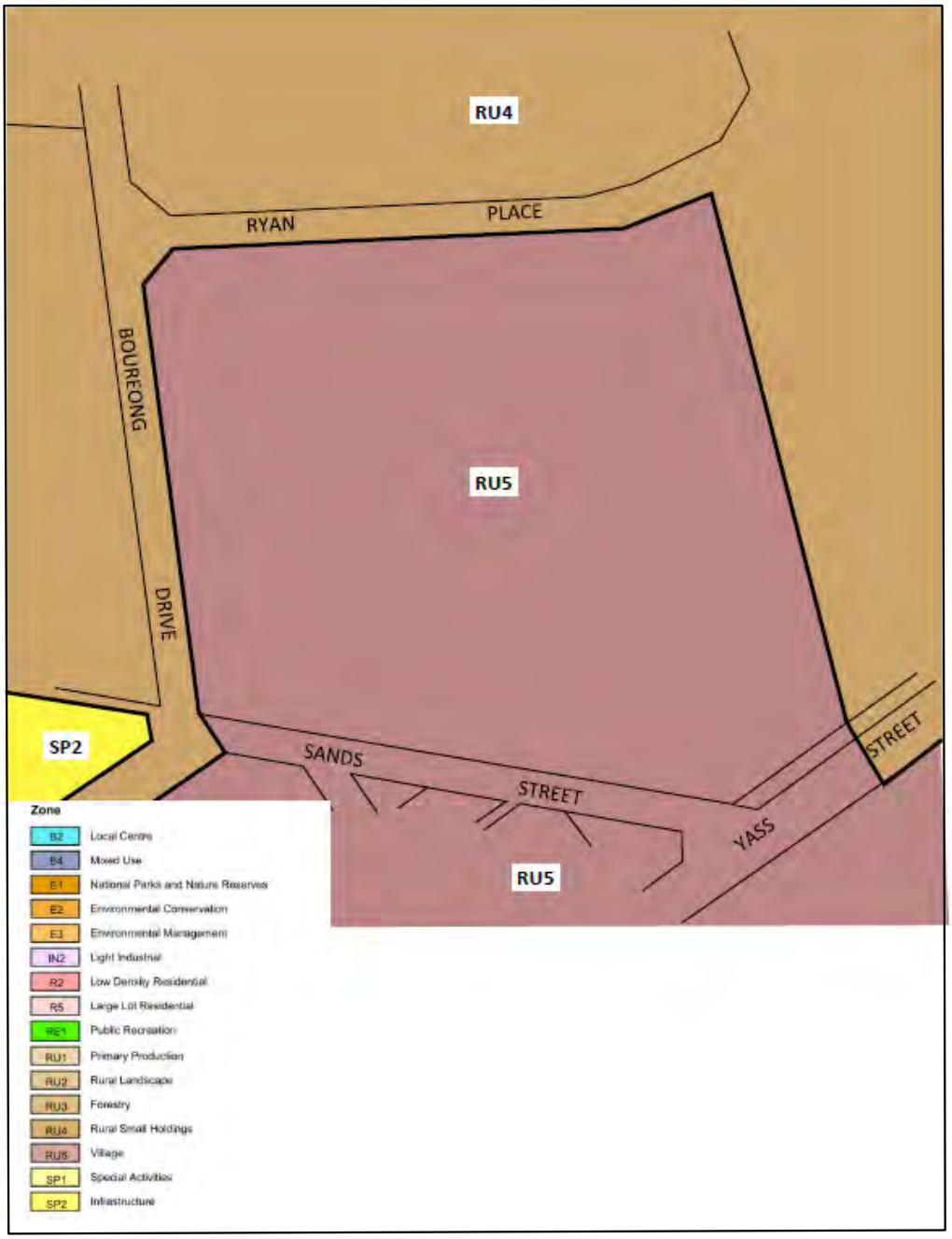


Figure 3: The proposed amendment to Upper Lachlan Land Zoning Map
RU5 Village Zone
(Land Zoning Map - Sheets LZN_003C and LZN_003E)
Upper Lachlan Local Environmental Plan 2010
(Map Source: NSW Legislation website)

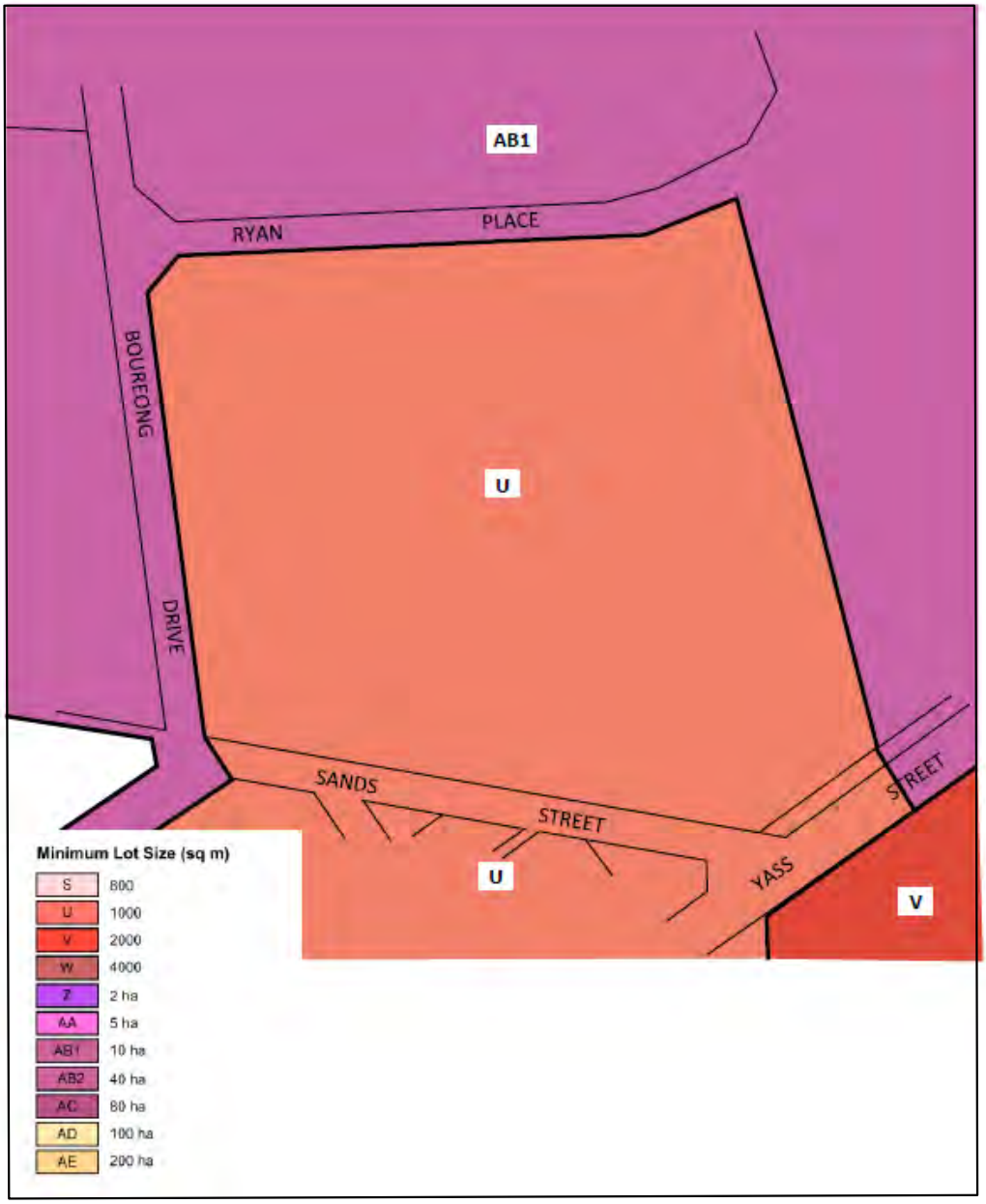


Figure 4: The proposed Minimum Lot Size to apply to the land
Minimum Lot Size 1000m^2 (U)
(Lot Size Map - Sheets LSZ_003C and LSZ_003E)
Upper Lachlan Local Environmental Plan 2010
(Map Source: NSW Legislation website)

PART 5 – COMMUNITY CONSULTATION

The document "A guide to preparing local environmental plans" outlines the consultation required for different types of planning proposals and the gateway determination will specify the community consultation that must be undertaken on the planning proposal. It is expected that the exhibition period for this low impact proposal will be 28 days. A 'low' impact planning proposal is a planning proposal that, in the opinion of the person making the Gateway determination is:

- consistent with the pattern 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 public land.

The Planning Proposal will be notified in local newspapers that circulate the area affected, Council's website, in writing to adjoining landowners and public authorities. Details of the Planning Proposal and how to make a submission will be included in this notification. Laterals Planning will respond to any feedback from the Council, public authorities and the community in relation to the Planning Proposal.

PART 6 PROJECT TIMELINE

The following project timeline is provided for the planning proposal:

Anticipated commencement date *(date of Gateway determination):*

March 2024

Anticipated timeframe for the completion of required technical information:

April 2024

Timeframe for government agency consultation *(pre and post exhibition as required by Gateway determination):*

May 2024

Commencement and completion dates for public exhibition period:

June 2024

Dates for public hearing (if required):

Not required

Timeframe for consideration of submissions:

August 2024

Timeframe for the consideration of a proposal post exhibition:

September 2024

Date of submission to the department to finalise the LEP:

October 2024

Anticipated date RPA will make the plan (if delegated):

November 2024

Anticipated date RPA will forward to the department for notification:

December 2024

CONCLUSION and RECOMMENDATION

An assessment of the Planning Proposal has been completed in accordance with the guidelines prepared by NSW Department of Planning and is the best means of achieving the intended outcome of the Planning Proposal to rezone and amend the lot size for certain land being:

- Lot 4 DP 1198749 from RU4 Primary Production Small Lots zone to RU5 Village zone and reduce the minimum lot size from 10ha to 1,000m^2 to enable the development of dwelling houses on lots to be created under the *Upper Lachlan Local Environmental Plan 2010* (LEP 2010).

It is recommended that the Planning Proposal be endorsed by the Upper Lachlan Shire Council and forwarded to the Minister for Planning for a Gateway Determination in accordance with the *Environmental Planning and Assessment Act 1979* on the following grounds:

- An increase in the permissible density of land is justified in terms of its consistency with the objectives and actions contained within the *Draft South East and Tablelands Regional Plan 2036* and *The Tablelands Regional Community Strategic Plan 2016-2041.*
- The Planning Proposal is consistent with the Upper Lachlan Shire Local Strategic Planning Statement 2040 and in particular will provide an opportunity for new settlements close to existing urban service centres and provide value-adding to agriculture by small-scale intensive agriculture opportunities.
- The Planning Proposal complies with this identified growth area for Gunning.
- The Planning Proposal is consistent with the Upper Lachlan Local Planning Statement 2040 insofar that the development will provide for various lifestyle living opportunities whilst ensuring environmental sustainability, preservation of history and a sense of belonging in a community as well as providing services and facilities to enhance the quality of life and economic viability within the Council area.
- The proximity of the subject land to Gunning will support economic growth within the Upper Lachlan Council area and particularly in the Gunning environs.
- There is a demand for this type of development in the Upper Lachlan area.
- The Planning Proposal also meets all the relevant State, Regional and Local planning policies.

ANNEXURES

ANNEXURE 1

UPPER LACHLAN SHIRE COUNCIL

MINUTES OF THE

ORDINARY MEETING OF COUNCIL

HELD IN THE COUNCIL CHAMBERS

ON 14 DECEMBER 2023

REPORTS FROM STAFF AND STANDING COMMITTEES

SECTION 11: ENVIRONMENT AND PLANNING

ITEM 11.1 PLANNING PROPOSAL - LOT 4 DP 1198749 - 18 BOUREONG DRIVE, GUNNING

239/23 ***RESOLVED*** by Cr Searl and Cr Woodbridge

1. Council supports the amendments to the Local Strategic Planning Statement
2. The Council submits the planning proposal for a Gateway Determination to amend the Upper Lachlan Local Environmental Plan 2010 by changing the zone and minimum lot size provisions of Lot 4 DP 1198749 from RU4 Primary Production Small Lots zone to RU5 Village zone and to reduce the minimum lot size from 10Ha to 1000m2.
3. The Council requests the Department of Planning and Environment to authorise Council to exercise delegation of plan making functions in accordance with the Environmental Planning and Assessment Act 1979.
4. The Council notifies the community of the proposed changes to the local environmental plan through appropriate processes at the time.

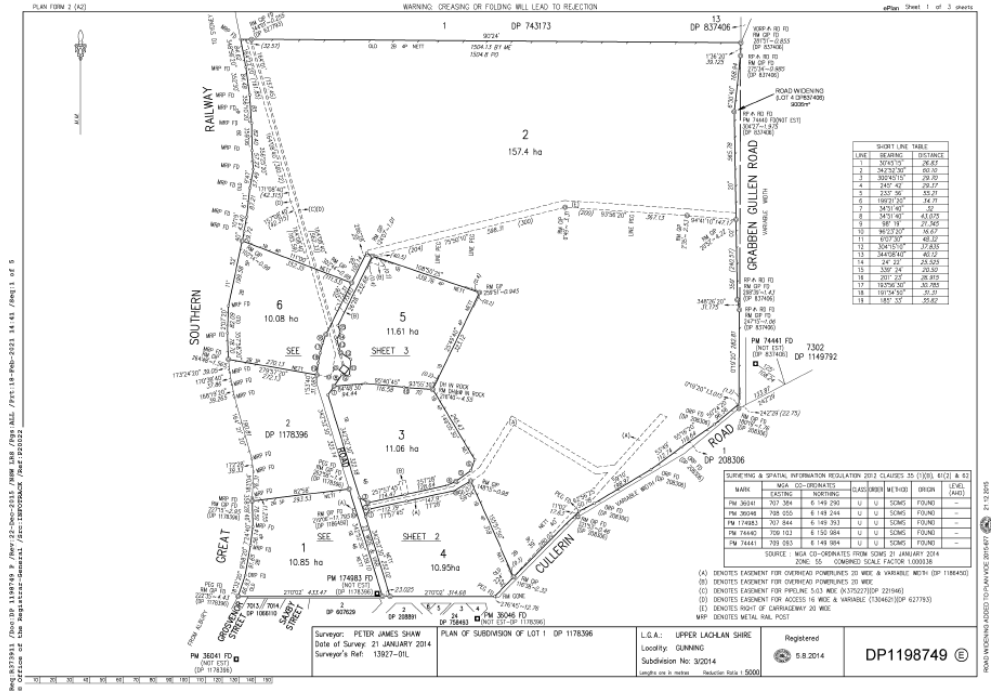
- CARRIED

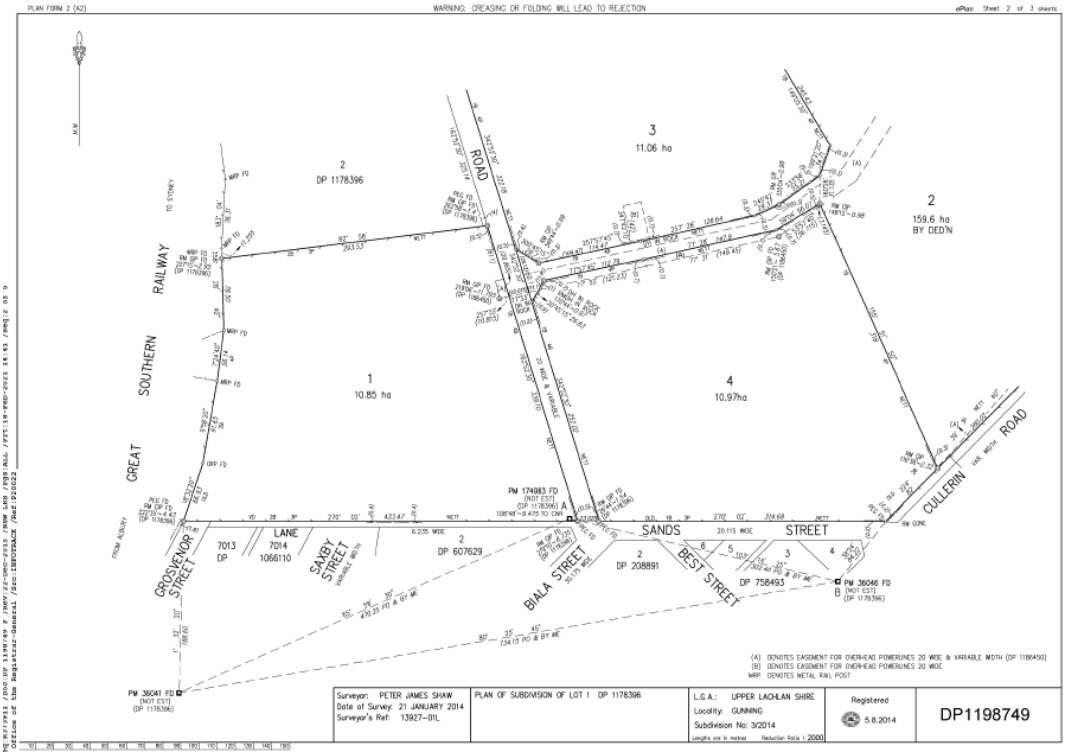
Councillors who voted for:- Crs P Kensit, M McDonald, P Culhane, J Marshall, S Reynolds, J Searl and L Woodbridge

Councillors who voted against:- Nil

ANNEXURE 2

DEPOSITED PLAN 1198749 - Sheet 1 and Sheet 2

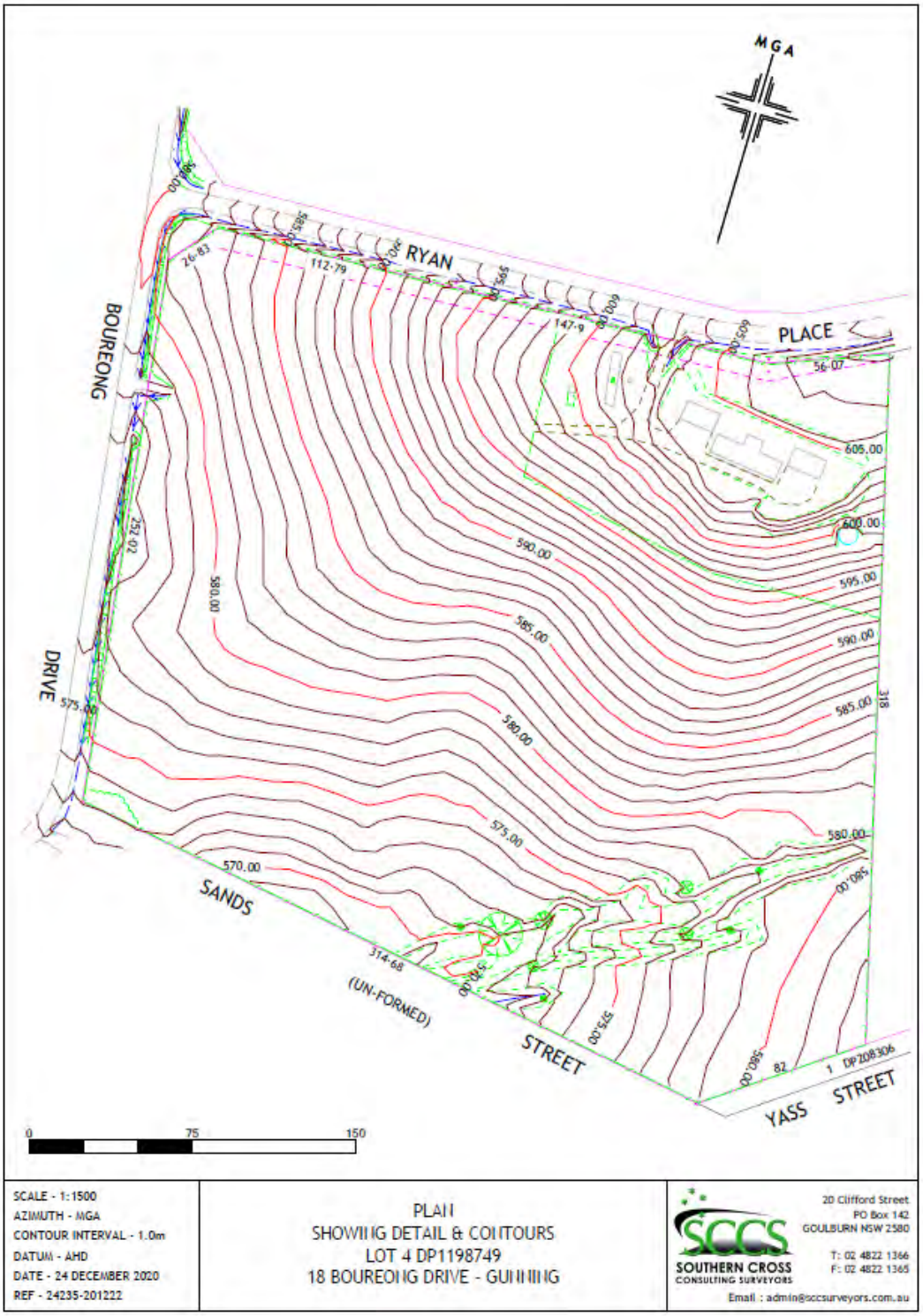




ANNEXURE 3

Site Contour Plan

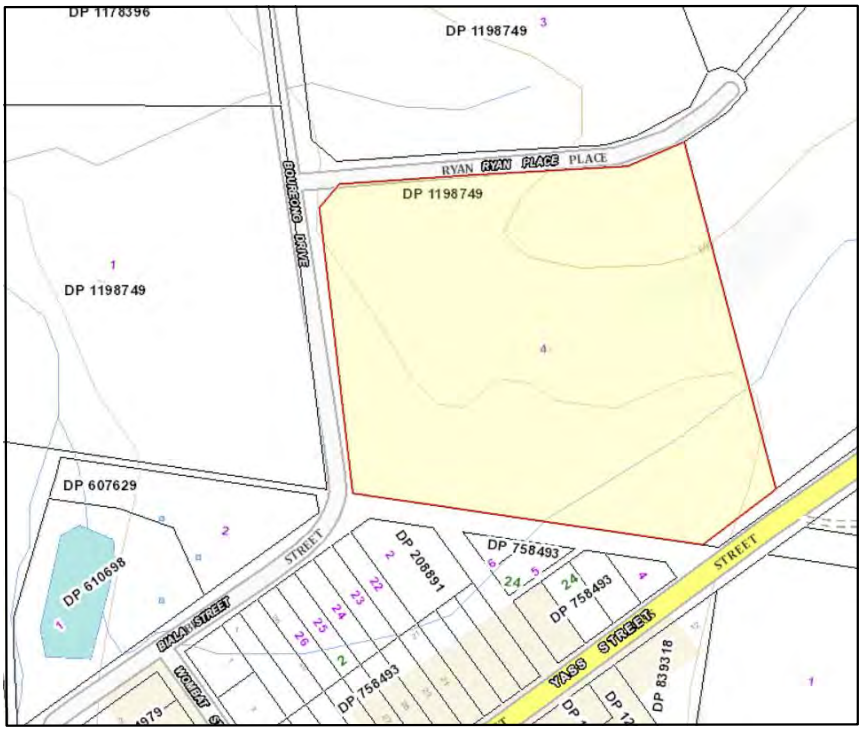
(Plan Source: Southern Cross Consulting Surveyors)



ANNEXURE 4

Aerial Photograph and Topographic Map

(Map Source: Six Maps)



ANNEXURE 5

Biodiversity Assessment by Macrozamia Environmental Consulting

(Separately Attached)

ANNEXURE 6

Odour Amenity Impact Assessment by SLR Consulting Australia Pty Ltd

SLR Letter to EPA dated 31 May 2022

SLR Letter to Upper Lachlan Shire Council dated 25 May 2023

Laterals Additional Information to the Upper Lachlan Shire Council dated 16 June 2023

(Separately Attached)

ANNEXURE 7

AHIMS Web Services (AWS)
Search Result

Your Ref/PO Number : P20022
Client Service ID : 854479

Laterals Planning

Date: 15 January 2024

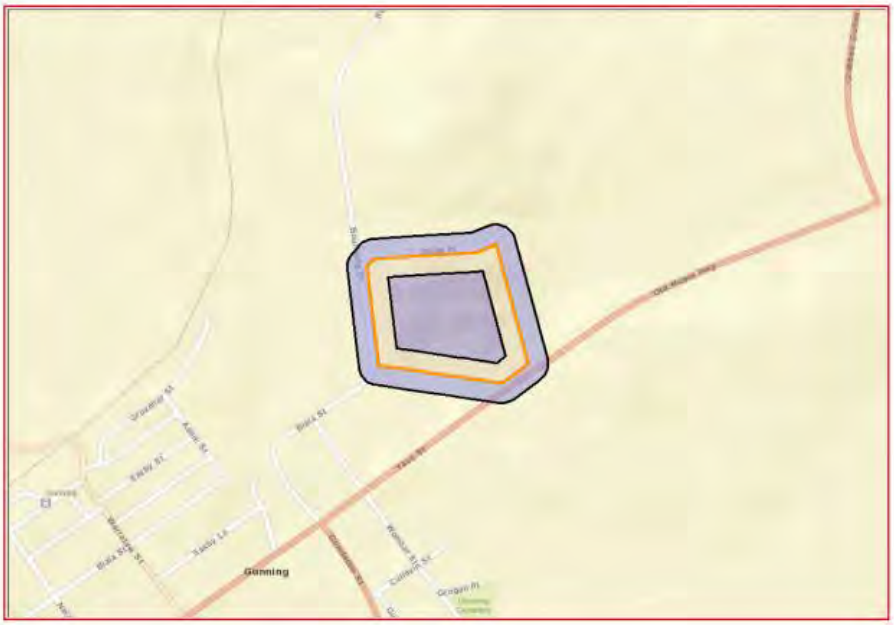
Attention: Robert Mowle

Email: robert@laterals.com.au

Dear Sir or Madam:

AHIMS Web Service search for the following area at Lot : 4, DP:DP1198749, Section : - with a Buffer of 50 meters, conducted by Robert Mowle on 15 January 2024.

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



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

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

AHIMS Web Services (AWS)
Search Result

Your Ref/PO Number : P20022
Client Service ID : 854481

Laterals Planning

Date: 15 January 2024

Attention: Robert Mowle

Email: robert@laterals.com.au

Dear Sir or Madam:

AHIMS Web Service search for the following area at Lot : 4, DP:DP1198749, Section : - with a Buffer of 200 meters, conducted by Robert Mowle on 15 January 2024.

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

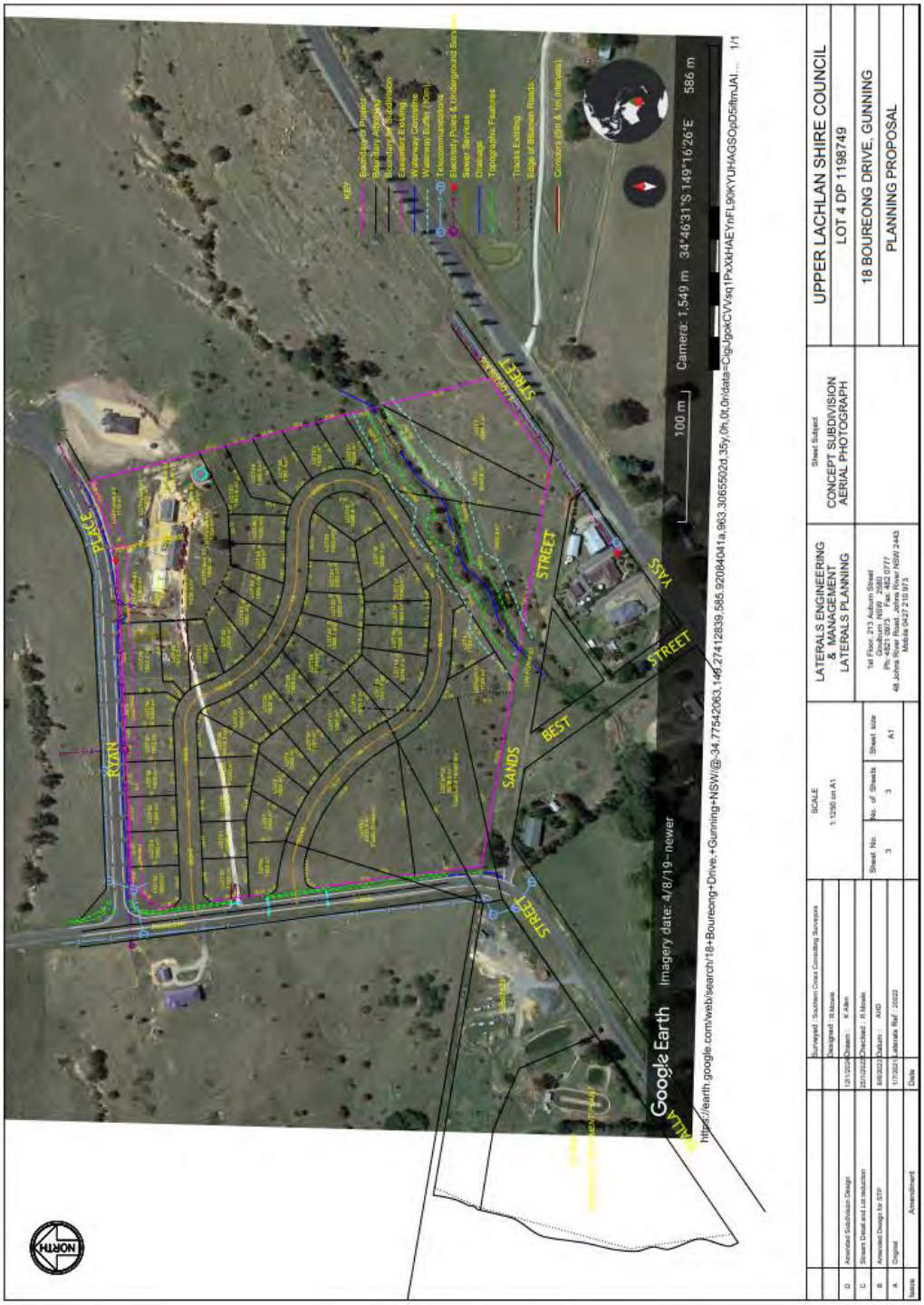
A search of Heritage NSW AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that:

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

ANNEXURE 8

Site Concept Development Plans


KEY
Boundary of Project
Boundary Adjoining
Boundary for Subdivision
Easement Existing
Waterway Centreline
Waterway Buffer (10m)
Telecommunications
Electricity Poles & Underground Services
Sewer Services
Drainage
Topographic Features
Trees Existing
Tracks Existing
Edge of Bitumen Roads
Buildings Existing
Contours (5m & 1m intervals)
NORTH
BRYAN PLACE
STREET
YASS
STREET
BEST
SANDS
STREET
BALLA
SEWERAGE TREATMENT PLANT
UPPER LACHLAN SHIRE COUNCIL
LOT 4 DP 1198749
18 BOUREONG DRIVE, GUNNING
PLANNING PROPOSAL
CONCEPT SUBDIVISION TOPOGRAPHIC DETAILS
LATERALS ENGINEERING & MANAGEMENT
LATERALS PLANNING
SCALE
1:1250 on A1
Sheet No. 2
No. of Sheets 3
Sheet size A1


KEY
Boundaries Pointed
Boundary Adjacent
Boundary of Subdivision
Easement Existing
Waterway Centreline
Waterway Buffer (50m)
Telecommunications
Electricity Poles & Underground Services
Sewer Services
Drainage
Topographic Features
Tracks Existing
Edge of Bitumen Roads
Contours (5m & 1m Intervals)
Camera: 1,549 m 34°46'31"S 149°16'26"E 586 m
100 m
https://earth.google.com/web/search/18+Boureong+Drive,+Gunning+NSW/@-34.77542063,149.27412839,585.92084041a,963.30655502d,35y,0h,0t,0r/data=CigiJgokCVVsq1PxXkHAEYnFL90KYUHAGSOpD5ifmnJAI...
Google Earth
Imagery date: 4/8/19 newer
RYAN
PEAKE
STREET
SANDS
BEST
YASS
STREET
STREET
NORTH
Surveyed : Southern Cross Consulting Surveyors
Designed : R.Marsh
Drawn : K.Allen
Checked : R.Marsh
Datum : AHD
Laterals Ref : 2022
Data
SCALE
1:1250 on A1
Sheet No.
3
No. of Sheets
3
Sheet size
A1
LATERALS ENGINEERING & MANAGEMENT
LATERALS PLANNING
1st Floor, 213 Auburn Street
Goulburn NSW 2580
Ph: 4822 3007 Fax: 4822 0777
48 Johns River Road, Johns River NSW 2443
Mobile 0427 210 973
Sheet Subject
CONCEPT SUBDIVISION AERIAL PHOTOGRAPH
UPPER LACHLAN SHIRE COUNCIL
LOT 4 DP 1198749
18 BOUREONG DRIVE, GUNNING
PLANNING PROPOSAL
Issue
Amendment
Date
D Amended Subdivision Design 13/1/2025
C Stream Desk and Lot reduction 20/1/2023
B Amended Design for DTP 6/9/2022
A Original 17/7/2021
1/1

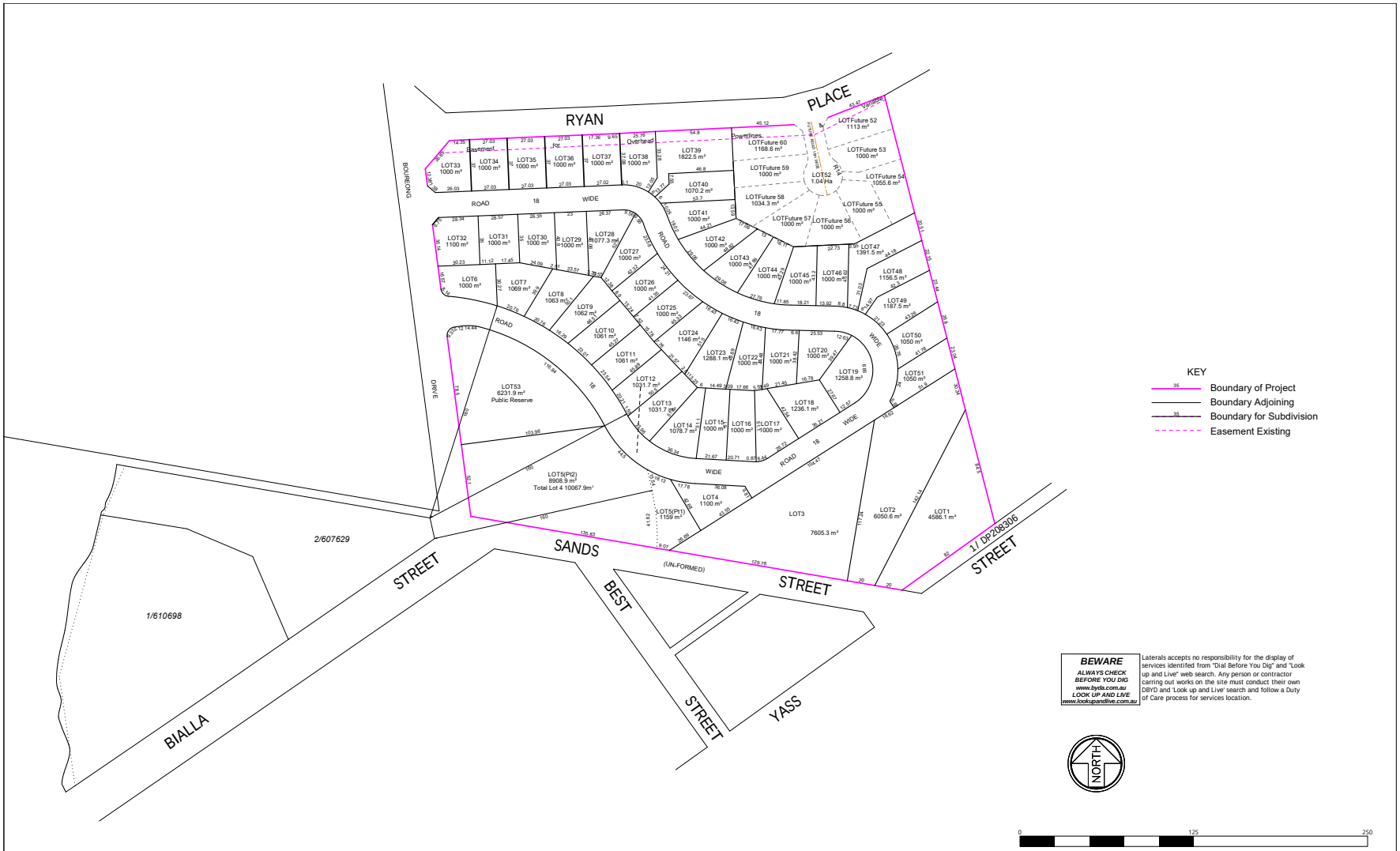
ANNEXURE 9

Site Photographs

(Dated 2 August 2021)

View from Yass Street

View from Boureong Drive



			Surveyed : Southern Cross Consulting Surveyors	SCALE	LATERALS ENGINEERING & MANAGEMENT LATERALS PLANNING	Sheet Subject	UPPER LACHLAN SHIRE COUNCIL
			Designed : R Mowle	1:1250 on A1		CONCEPT SUBDIVISION	LOT 4 DP 1198749
D	Amended Subdivision Design	12/1/2024	Drawn : K Allen				18 BOUREONG DRIVE, GUNNING
C	Stream Detail and Lot reduction	25/1/2023	Checked : R Mowle	Sheet No. 1 / No. of Sheets 3 / Sheet size A1	1st Floor, 213 Auburn Street Goulburn NSW 2580 Ph: 4821 0973 Fax: 482 0777 48 Johns River Road, Johns River NSW 2443 Mobile 0427 210 973		PLANNING PROPOSAL
B	Amended Design for STP	8/6/2022	Datum : AHD				
A	Original	1/7/2021	Laterals Ref : 20022				
Issue	Amendment	Date					

			Surveyed : Southern Cross Consulting Surveyors	SCALE	LATERALS ENGINEERING & MANAGEMENT LATERALS PLANNING	Sheet Subject	UPPER LACHLAN SHIRE COUNCIL
			Designed : R Mowle	1:1250 on A1		CONCEPT SUBDIVISION AERIAL PHOTOGRAPH	LOT 4 DP 1198749
D	Amended Subdivision Design	12/1/2024	Drawn : K Allen				18 BOUREONG DRIVE, GUNNING
C	Stream Detail and Lot reduction	25/1/2023	Checked : R Mowle	Sheet No. 3 / No. of Sheets 3 / Sheet size A1	1st Floor, 213 Auburn Street Goulburn NSW 2580 Ph: 4821 0973 Fax: 482 0777 48 Johns River Road, Johns River NSW 2443 Mobile 0427 210 973		PLANNING PROPOSAL
B	Amended Design for STP	8/6/2022	Datum : AHD				
A	Original	1/7/2021	Laterals Ref : 20022				
Issue	Amendment	Date					

Macrozamia Environmental Consulting
consulting.macrozamia.com.au
info@macrozamia.com.au
abn 37 902 748 749

BIODIVERSITY ASSESSMENT

Planning Proposal
Minimum lot size reduction
Lot 4 DP 1198749
18 Boureong Drive, Gunning, NSW.

January 2021

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Contents

1. Introduction

1.1. Background

This report has been prepared by Macrozamia Environmental to support a Planning Proposal to Upper Lachlan Shire Council for a reduction in the minimum lot size for Lot 4 DP 1198749, Gunning NSW from 10ha to 1000m^2. The parcel of land lies on the north side of the Village of Gunning in the Southern Tablelands of NSW between Yass and Goulburn. The land is currently zoned RU4 Primary Production Small Lots and adjoins to the south, land zoned RU5 Village. The land supports a rural residential dwelling and has a long history of agricultural grazing.

This Biodiversity Assessment considers the potential impacts of the proposal on biodiversity matters. While the proposal is an administrative one, it would open the opportunity for the land to be subdivided for residential uses. In such a scenario a new Biodiversity Assessment would be required that considers the specific impacts of a proposed subdivision design, as such this Biodiversity Assessment takes a strategic perspective of biodiversity impact of the proposal in this landscape.

The project site is located in a rural district and is characterised by grazing land to the west, north and east and residential village to the south.

1.2. Site Description

The 13ha subject site, Lot 4 DP 1198749, 18 Boureong Drive, Gunning, NSW, occurs in a rural/ village landscape to the north of Gunning Village in the south of the Upper Lachlan Local Government Area. The site is 39km to the east of Yass and 49km to the west of Goulburn in the Southern Tablelands.

Vegetation has been heavily modified in this landscape since European settlement. The landscape, including the subject site, have been used for agriculture predominantly grazing for most of the past 200 years. The subject site can be described as an agricultural pasture it supports very little native vegetation and is dominated by exotic grasses. Few trees or shrubs occur on the site, a first order drainageline traverses the southern end of the site from northeast to south along which a greater diversity of flora occurs including some native trees.

Consistent with the Office of Environment and Heritage *Threatened Species Test of Significance Guidelines* (2018), in this report;

> ***Subject Site*** *means the area directly affected by the proposal. The subject site includes the footprint of the development and any ancillary works, facilities, accesses or hazard reduction zones that support the construction or operation of the development or activity.*

And

> ***Study Area*** *means the subject site and any additional areas which are likely to be affected by the proposal, either directly or indirectly. The study area should extend as far as is necessary to take all potential impacts into account.*

The *Subject Site* includes the whole of Lot 4 DP 1198749 as the proposal applies to this parcel explicitly. Future development of the lands will entail specific areas directly impacted by those proposals and will entail different Subject Sites.

The *Study Area* for this assessment includes the whole of 4 DP 1198749 and adjoining lands to the extent that they may be impacted by the proposal, this includes a buffer area of 1km however efforts are focused on biodiversity linkages that could impacted by the proposal. As this Biodiversity Assessment considers a strategic perspective on biodiversity impacts, it is important to consider the site within the biological landscape.

The proposal location and study area are identified on Map 1-1 of this report and specific site activities detailed in the concept plans at Appendix 2 of this report.

1.3. Aims of this Report

The purpose of this report is to identify and assess the terrestrial biodiversity, including flora, fauna and communities occurring in the study area and the likely impacts of the proposed development on these matters, with consideration of the site's landscape context. This report addresses the legislative framework below;

i. The Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)
   a. Biodiversity Matters of National Environmental Significance

      Identification of protected matters at risk of impact and assessment of significance of any impact

ii. NSW *Biodiversity Conservation Act 2016* (BC Act)
   a. Part 4, Divisions 2 and 5

      Consideration of listed species, ecological communities and key threatening processes to be considered under s7.3
   b. Section 7.3

      Test of Significance, for determining whether proposed development or activity is likely to significantly affect threatened species or ecological communities, or their habitats

iii. NSW *Environmental Planning and Assessment Act 1979* (EP&A Act)
   a. Part 5, Infrastructure and environmental impact assessment

iv. NSW *State Environmental Planning Policy (Koala Habitat Protection) 2019* (Koala SEPP)
   a. Part 2, Section 9 - Development assessment process—no approved koala plan of management for land

v. *Upper Lachlan Local Environmental Plan 2010* (LEP)
   a. Clause 6.2 – Biodiversity

(1) The objective of this clause is to maintain terrestrial and aquatic biodiversity including—
   (a) protecting native fauna and flora, and
   (b) protecting the ecological processes necessary for their continued existence &
   (c) encouraging the recovery of native fauna and flora, and their habitats.

(2) This clause applies to land identified as "sensitive land" on the Natural Resources Sensitivity—Biodiversity Map.

This Biodiversity Assessment aims to

- Provide a description of the subject site and study area
- Describe the methods used to assess biodiversity
- Identify the key flora and fauna species & vegetation communities present in the study area, including an assessment of potential habitat values of the site and their interaction with habitats outside the study area
- Identifies the listed threatened species, populations migratory species & ecological communities with potential to occur in the study area
- Define the potential impacts of the proposal on biodiversity and assess the significance of potential impacts on threatened species, populations and ecological communities and migratory species.

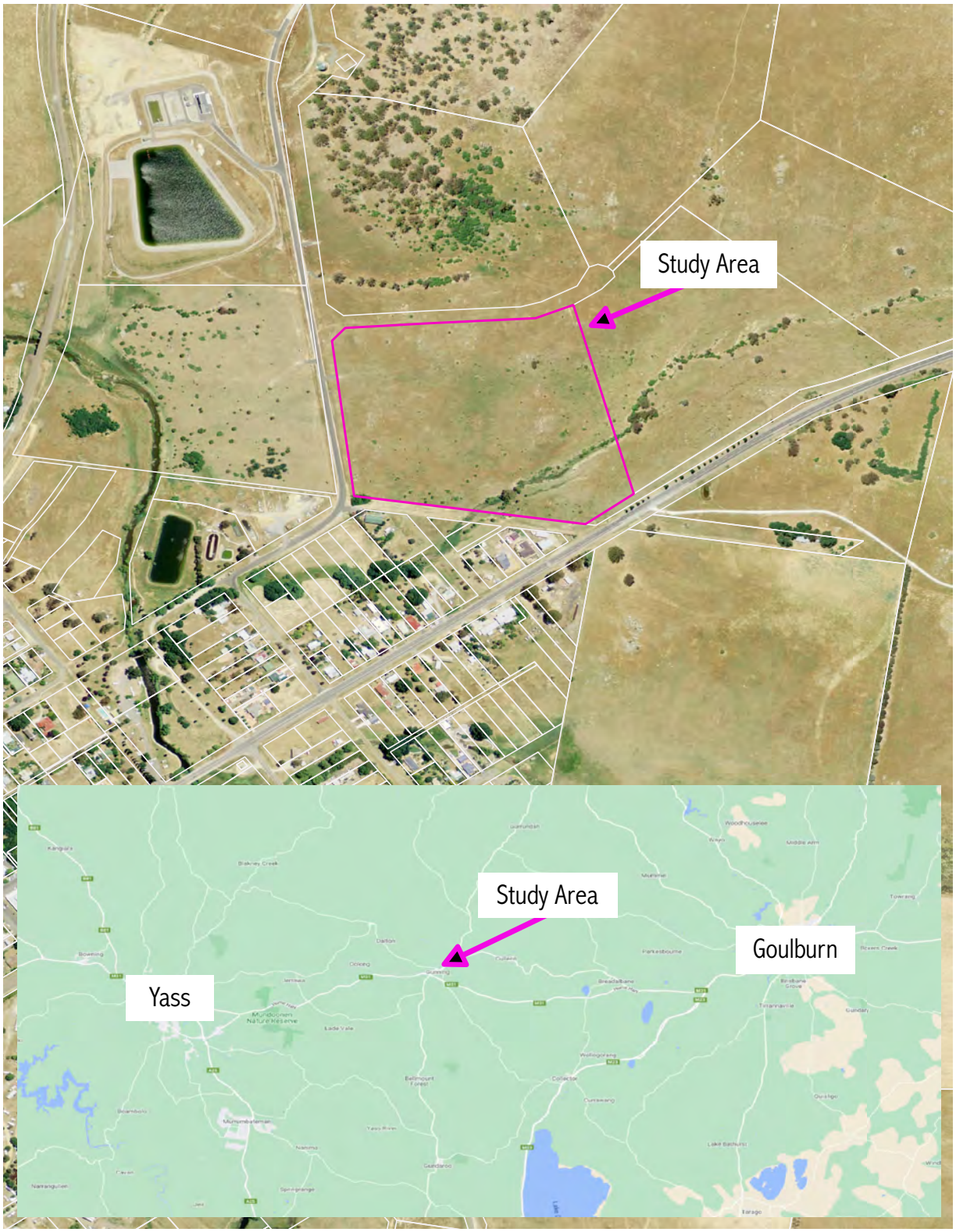
It is important to note that not all species that occur on or use this site could be identified without an extended survey period of several seasons and over numerous site visits. A survey of this extent is beyond the scope of this assessment more accurate field survey will be undertaken for any future development as required. To compensate for this, habitats have been assessed with consideration of potentially occurring species applying the principle, particularly in relation to listed matters.

1.4. Description of Proposal

The proposal is to reduce the minimum lot size of Lot 4 DP 1198749 from 10ha to 1000m^2.

This will allow subsequent subdivision of the land, subject to site constraints, into lot sizes of at least 1000m^2.

This Biodiversity Assessment considers the potential impact on flora and fauna of the proposal including matters protected under legislation. The impact assessment is based on the capacity of the landscape to support lot sizes of 1000m^2 on this site. However, it does not consider a specific subdivision design. Any future development application for subdivision must be accompanied by a specific biodiversity assessment for that application.



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Map 1-1
Study Area and Locality

0 100 200 300 m

2. Methods

2.1. Literature and Database Review

The study area and its landscape context were considered through a literature and database review in preparation for field survey and to inform survey aims and threatened biodiversity assessments. Aerial photography, NSW Government GIS data and NSW & Commonwealth databases as well as Macrozamia Environmental's records from previous surveys all informed this review, the following sources being key to this assessment;

- Current versions of legislation referred to in section 1.3 of this Biodiversity Assessment, *NSW Legislation website*
- NSW ePlanning Spatial Viewer, *NSW Department of Planning, Industry and Environment*
- BioNet Atlas of NSW Wildlife, *NSW Office of Environment and Heritage*
- Threatened Biodiversity Profiles, *NSW Office of Environment and Heritage*
- NSW Vegetation Information System, *NSW Office of Environment and Heritage*
- *Land and Property Information* SIX Map Topographic and Cadastral Data for this Local Government Area, periodically updated on our GIS
- EPBC Protected Matters Search Tool, *Commonwealth Department of Agriculture, Water and the Environment*.

Wherever applicable, NSW and Commonwealth policies and guidelines have been adopted in the undertaking of this assessment, the following have been key to preparation of this report;

- Threatened Species Test of Significance Guidelines *NSW Office of Environment and Heritage 2018*
- The EPBC Act Matters of National Environmental Significance: Significant Impact Guidelines, *Department of Environment, Water, Heritage and the Arts 2013*.

Threatened species, populations and migratory species that were recorded within 10km of the study area in the BioNet Atlas of NSW Wildlife and listed in the EPBC Protected Matters Search Tool were considered for their likelihood of occurrence in the study area the following factors informed this assessment;

- The location and date of records
- Habitat within the study area and habitats in the landscape including the continuity of suitable habitats for the matter under consideration
- Scientific literature pertaining to each matter and applying ecological knowledge to the assessment.

The potential for each threatened matter or migratory species to occur was then considered and the necessity for targeted field surveys was determined. Following field surveys and review of habitat occurring in the study area, the potential for species, communities or populations to use the study area or to be impacted directly or indirectly by the proposal was assessed, this assessment is summarised in the table at Appendix 1 of this report.

2.2. Field Survey

The study area has been considered for its terrain and landscape features, vegetation communities in the study area were defined and mapped and consideration made how they link to habitats of the surrounding landscape.

2.3. Flora and Vegetation Communities

All flora and fauna species identified were recorded along with ecological communities and habitat components occurring on the site.

Key flora species were recorded and vegetation communities mapped and defined then compared with OEH defined Plant Community Types and checked against described listed vegetation communities.

Targeted surveys were undertaken for threatened species of plants that were considered to have potential to occur on the site based on desktop research or where habitats on site were found to be suitable.

Floral nomenclature is consistent with *The Plant Information Network System of The Royal Botanic Gardens and Domain Trust* PlantNET online resource.

2.4. Fauna and Fauna Habitats

Given the lack of habitat available on the site or nearby, no structured fauna surveys were undertaken.

Habitat components that may be used for foraging, roosting, breeding or nesting by any potentially occurring fauna were considered, along with the continuity of habitat present within the study area as well as stepping stone or corridor habitat that may connect the study area to other parts of the landscape, particularly to areas of quality habitat or conservation areas.

Habitat surveys targeted tree hollows, stags, bird nests, possum dreys, decorticating bark, rock shelters, rock outcrops / crevices, mature / old growth trees, food species particularly nectar producing and palatable species such as mistletoes and proteaceae species.

Artificial structures such as bridges/ culverts, dams, service pits and other structures were also considered for their habitat value.

Faunal nomenclature is consistent with;

- Cogger, H. (1992). Reptiles and Amphibians of Australia, Revised Edition. Reed, Sydney.
- Morcombe, M. (2000). Field Guide to Australian Birds. Steve Parish Publishing Pty Ltd, Queensland.
- Strahan, R. (1995). The Mammals of Australia. Australian Museum/Reed Books, Sydney.

2.5. Survey Limitations

The flora survey aimed to record all the key and most frequent species occurring on the study area in order to accurately describe vegetation characteristics and classify plant community types present as well as all important weed species. A definitive list of the flora occurring in the study area cannot be derived without structured surveys over several seasons. Such survey effort is beyond the scope of this assessment given past land uses on the site, its degraded nature and the nature of the proposal's impacts.

Despite these limitations the biodiversity assessment undertaken for flora, vegetation communities and fauna is adequate to undertake appropriate biodiversity impact assessment.

Biodiversity survey following OEH's published threatened species survey and assessment guidelines was not undertaken as sufficient detail to determine the likelihood of occurrence of threatened species and communities as well as potentially occurring migratory species for the purposes of this assessment has been achieved through flora and habitat assessment during the field survey.

3. Results

3.1. Literature and Database Review

Desktop assessment has identified the following characteristics of the site;

Landform and drainage

The study area occurs at an elevation of 650 to 690m asl, it is for the most part sloping to the north and drained by ephemeral watercourses towards Jerrara Creek and which flows to the east to the Shoalhaven River.

Soils and geology

The majority of the study area is mapped as the "Garland Soil Landscape" *NSW Soil Landscapes 1:150000 mapping* and a small area in the northeast corner is mapped as the "Wyangala Soil Landscape".

The Garland Soil Landscape is described as occurring in undulating rises and valleys formed from granitic parent material. Extensive areas occur in two north- south trending bands between Gunning and Hovells Creek and between Tarago Lagoon and the Isabella River. Commonly light red sandy duplex soils on upper slopes and mottled yellow duplex soils with sandy textured topsoils and bleached A2 horizons on mid and lower slopes. Sandy Red and Yellow Earths also found on sideslopes. Deep Siliceous Sands are found in some drainage lines. Granitic tors and pavements occasionally present. In some areas Red Podzolic Soils may be dominant.

Gullying of drainage lines is the most frequent form of soil erosion. Where gullies are allowed to progress unchecked, they can often reach depths of >3 m. Sheet erosion occurs only in very dry years or following bushfires, because the predominantly slightly sandy textured soils respond quickly to even relatively light falls of rain. Occasional salting in low-lying areas, particularly where Ordovician metasediments occur upslope.

In terms of native vegetation only scattered trees remain. Likely vegetation community is a Savannah woodland of yellow box and Blakelys red gum. A well-developed herbaceous layer, composed of spear grasses, kangaroo grass, and Poa species, occurred naturally beneath the open tree canopy. However, because of heavy grazing or fires, these grasses have been wholly or partly replaced with wallaby grasses, wire grass and often shrubs.

The Wyangala Soil Landscape is described as occurring on the Wyangala granite in north-south trending bands between gunning and Hovels creek. Siliceous Sands, Red Earths and red duplex soils occur on sideslopes with Yellow Podzolic Soils on footslopes and in some drainage lines. Large granitic boulders are a feature.

Some gully erosion is found within the drainage lines. Sheet erosion occurs following drought or bushfires. Occasional salting of low-lying areas. Most of the area has been substantially cleared. The most likely original vegetation community was a Savannah woodland of yellow box and Blakelys red gum. In western areas cypress pine (*Callitris spp*.) sometimes occur on the crests of hills.

Environmental planning

Upper Lachlan Local Environmental Plan 2010 (LEP)

Parts of the Study Area are mapped as "sensitive land" on the Natural Resources Sensitivity—Biodiversity Map. As such the following clauses apply;

> (3) Before determining a development application for land to which this clause applies, the consent authority must consider any adverse impact from the proposed development on—

(a) a native ecological community, and

(b) the habitat of any threatened species, populations or ecological community, and

(c) a regionally significant species of fauna and flora or habitat, and

(d) a habitat element providing connectivity.

(4) Development consent must not be granted to development on land to which this clause applies unless the consent authority is satisfied that—

(a) the development is designed, sited and will be managed to avoid any adverse environmental impact, or

(b) if that impact cannot be avoided—the development is designed, sited and will be managed to minimise that impact, or

(c) if that impact cannot be minimised—the development will be managed to mitigate that impact.

This report cannot assess these matters in terms of possible future developments, it will be necessary for any future development applications to meet the requirements of sub-clauses (3) and (4). This report does consider the feasibility of Clause 6.2 – Biodiversity applying to future development of the site.

SEPP (Koala Habitat Protection) 2019

The Koala SEPP applies to this Local Government Area and there is no *approved koala plan of management* applying to the land. Consequently, before a Council may grant consent to a development application for consent to carry out development on the land, the Council must assess, in accordance with *the Guideline*, whether the development is likely to have any impact on koalas or koala habitat. This report addresses the Koala SEPP in Section 6.

Threatened Biodiversity

Section 4, *Threatened Species Populations & Ecological Communities*, of this report addresses findings of desktop review of threatened biodiversity.

Appendix 1 of this report presents these protected matters that have been considered in this assessment.

3.2. Vegetation communities and flora species

The study area occurs in an environment that has supported eucalypt dominated woodland and forest for many years prior to European settlement. These ecosystems have been progressively modified over the past 200 years, intersected by road and utility corridors and cleared for agriculture, typically grazing enterprises, in the lower flatter parts of the landscape while hill tops and ridges have typically been cleared for timber and often allowed to regenerate due to poorer soils and unsuitability for agriculture. In some parts of the landscape native vegetation communities are relatively intact, particularly on upper slopes and ridges, however they cannot be considered 'old growth' having suffered disturbance and clearing periodically in the past.

These areas of native vegetation still occurring in this landscape are typically Box-gum Woodland (*PCT 1330 Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion*). Elements of this community persist in a fragmented pattern however they are not intact examples of this community, often only canopy species remain and understories are grazed by domestic stock. In the immediate landscape, this community is represented by the canopy species Yellow-box (*Eucalyptus melliodora*), Apple-box (*E. bridgesiana*) and Blakelies Red-gum (*E. blakelyi*).

This community is listed as a Critically Endangered Ecological Community under the NSW BC Act listed as "*White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived*

Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions".

There are no examples of this community on the subject site and no examples of this community in the landscape are at risk of impact by the proposal.

Understory species are sparse and generally represented by exotic species including Hawthorn (*Crataegus laevigata*) and Sweet Briar (*Rosa rubiginosa*), these also occur on the subject site.

The vegetation of the study area is dominated by exotic pasture species, the following species were observed;

Clover (*Trifolium spp*.)

Dock (*Rumex spp*.)

Common centaury (*Centaurium erythraea*)

Hairy Panic (*Panicum effusum*)

Phalaris (*Phalaris aquatica*)

Serrated Tussock (*Nassella trichotoma*)

Chilean Needlegrass (*Nassella neesiana*)

Cocksfoot (*Dactylis glomerata*)

Fescue (*Vulpia spp*.)

Brome (*Bromus spp.*)

Rough Dog's Tail (*Cynosurus echinatus*)

Hair Grass (*Aira spp*.)

Wallaby Grass (*Rytidosperma spp*.)

Speargrasses (*Austrostipa spp.*)

Purple Wiregrass (*Aristida ramosa*)

Weeping Grass (*Microlaena stipoides*)

Star Cudweed (*Euchiton sphaericus*)

Serrated Tussock & Chilean Needlegrass are listed as weeds of national significance under schedules of the NSW *Biosecurity Act 2015* and *Local Land Services* (2017) future use of the site should manage these species, a weed management plan should be prepared and implemented with consideration of future land uses.

No flora species or communities were recorded or considered likely to occur that are listed matters under the BC Act or the EPBC Act.

3.3. Fauna and Fauna Habitat

Due to the limited survey period and lack of habitat diversity, few fauna were found using the site, however, the potential for fauna to use the site, particularly threatened species has been considered based on the habitats present.

The majority of the site offers little to no habitat of value to native fauna. The drainage line traversing the site offers some value in terms of minor vegetative structure, intermittent surface water and continuity across the landscape.

Important habitat components for fauna including vegetative structure, arboreal habitat,

seasonally flowering/ fruiting grasses and forbs, dead standing and fallen timber, rocky areas and termite mounds.

Habitat continuity across the subject site is generally poor along with continuity with other habitats in the landscape. In addition to a lack of wildlife corridors and steppingstone habitat, movement of fauna is hindered by tracks, roads, cleared corridors for electrical transmission infrastructure and rural fences.

No fauna species or fauna habitats were recorded or considered likely to occur that are listed matters under the BC Act or the EPBC Act.

3.4. Impacts

The proposal is an administrative one and will allow the subject site to change land use from agriculture to residential. The subject site has been managed for agriculture for many years and is typical of most of the land in the district, it is dominated by exotic pasture, devoid of native vegetation and offers very little biodiversity value. A change to residential use would increase the resources available to manage weeds and result in landscaping that improves biodiversity.

Specific impacts of a future subdivision of the subject site would need to be considered in the context of the subdivision design and the planning environment at the time a proposal is lodged. Section 9, *Impact Mitigation Measures*, of this report provide measures that will offset and manage potential impacts.

4. Threatened Species, Populations and Ecological Communities

The BC Act provides a series of native vegetation clearing thresholds and a Biodiversity Values Map (BVM) to determine the necessity for the impacts on biodiversity of a development to be assessed using the BC Act's Biodiversity Assessment Method. Due to the small size of this proposal it does not meet these thresholds and is not mapped on the BVM. Despite this, where there is potential for listed matters (species, populations or ecological communities) to be impacted by a proposal a Test of Significance must be undertaken to determine the significance of any impact.

The potential for protected matters occurring in the area to be impacted has been assessed in the threatened matter evaluations table at Appendix 1 of this report.

The findings of this assessment are as follows;

4.1. Threatened species

Appendix 1 addressed several listed species that have been recorded within 10km of the study area in the past or considered to have some potential to occur on the site based on habitats in the landscape.

Following this assessment, no Threatened Species listed under the BC Act were considered likely to occur on the site or be impacted by the proposal.

4.1. Endangered Populations

No Endangered Populations listed under the BC Act have been considered likely to be at risk of impact by the proposal.

4.2. Endangered Ecological Communities

Appendix 1 addressed 2 listed communities. Neither of these were found likely to be at risk of impact by the proposal, elements of Boxgum Woodland occur in the landscape however none persist on the subject area forming this community.

5. Environment Protection and Biodiversity Conservation Act 1999

The *Commonwealth Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) specifies that approval is required from the Commonwealth Minister for the Environment for actions that have, will have or are likely to have a significant impact on a matter of "national environmental significance".

The Act identifies nine matters of national environmental significance being:

1) World Heritage properties
2) National heritage places
3) Wetlands of international importance (Ramsar wetlands)
4) Threatened species and ecological communities
5) Migratory species
6) Commonwealth marine areas
7) Nuclear actions (including uranium mining)
8) Great Barrier Reef Marine Park
9) Water impacts from coal seam gas and large coal mining actions

Matters number 4 (Threatened species, ecological communities) and 5 (Migratory species) are relevant to this proposal.

5.1. Threatened Species & Ecological Communities:

Threatened species listed under this act have been considered in the Appendix 2 assessment along with NSW BC Act listed species.

The Commonwealth Environment Department protected matters search tool was used to highlight any maters of national environmental significance that could be of concern. No matters were considered likely to be impacted by the proposal.

5.2. Migratory Species:

In addition to threatened species and ecological communities, the EPBC Act allows for the listing of internationally protected migratory species, i.e. species listed under the Japan-Australia Migratory Bird Agreement (JAMBA), the China - Australia Migratory Bird Agreement (CAMBA) and the Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention).

No protected migratory species were observed on site at the time of this assessment or considered likely to occur on the site or rely on resources provided by its habitats.

6. State Environmental Planning Policy (Koala Habitat Protection) 2019

State Environmental Planning Policy (Koala Habitat Protection) 2019 (KHP SEPP) aims to encourage the conservation and management of areas of natural vegetation that provide habitat for koalas to support a permanent free-living population over their present range and reverse the current trend of koala population decline. This SEPP lists Local Government Areas (LGA) to which the SEPP applies, Koala use tree species for each koala management area and a mechanisms for the preparation and approval for koala plans of management.

The KHP SEPP applies in this LGA and no approved koala plan of management has been prepared for the land, as such the following applies.

> *9 Development assessment process—no approved koala plan of management for land*
>
> *(1) This clause applies to land to which this Policy applies if the land—*
>
> *(a (Repealed)*
>
> *(b) has an area of at least 1 hectare (including adjoining land within the same ownership), and*
>
> *(c) does not have an approved koala plan of management applying to the land.*
>
> *(2) Before a council may grant consent to a development application for consent to carry out development on the land, the council must assess, in accordance with the Guideline, whether the development is likely to have any impact on koalas or koala habitat.*
>
> *(3) If the council is satisfied that the development is likely to have low or no impact on koalas or koala habitat, the council may grant consent to the development application.*
>
> *(4) If the council is satisfied that the development is likely to have a higher level of impact on koalas or koala habitat, the council must, in deciding whether to grant consent to the development application, take into account a koala assessment report for the development.*
>
> *(5) However, despite subclauses (3) and (4), the council may grant development consent if the applicant provides to the council—*
>
> *(a) information, prepared by a suitably qualified and experienced person in accordance with the Guideline, the council is satisfied demonstrates that the land subject of the development application—*
>
> *(i) does not include any trees belonging to the koala use tree species listed in Schedule 2 for the relevant koala management area, or*
>
> *(ii) is not core koala habitat, or*
>
> *(b) information, prepared in accordance with the Guideline, the council is satisfied demonstrates that the land subject of the development application—*
>
> *(i) does not include any trees with a diameter at breast height over bark of more than 10 centimetres, or*
>
> *(ii) includes only horticultural or agricultural plantations.* The vegetation occurring on the site has been considered by a suitably qualified ecologist, trees do occur in the area that are listed as koala habitat trees by the KHP SEPP however the habitat is unlikely to support koalas due to its small area and remoteness from core koala habitat.

Core Koala Habitat is defined by KHP SEPP as follows;

> *(a) an area of land which has been assessed by a suitably qualified and experienced person in accordance with the Guideline as being highly suitable koala habitat and where koalas are recorded as being present at the time of assessment of the land as highly suitable koala habitat, or*
>
> *(b) an area of land which has been assessed by a suitably qualified and experienced person in accordance with the Guideline as being highly suitable koala habitat and where koalas have been recorded as being present in the previous 18 years.*

At this stage this SEPP will not apply as a Development Application has not been lodged, however, a subsequent application for subdivision will trigger clause 9 (3), as; *development is likely to have low or no impact on koalas or koala habitat.* In this case, Council must be satisfied that the development is likely to have low or no impact on koalas or koala habitat before the Council may grant consent to the development application

Habitat on the site is unlikely to support koalas, koala habitat is not present on or near the subject site and a subdivision would not have any impact on koalas or koala habitat. Therefore it is unlikely that the Koala SEPP would preclude a future subdivision development on this site.

7. NSW Fisheries Management Act 1994

The Fisheries Management Act 1994 provides for the protection of fish and marine vegetation, endangered populations and ecological communities by a listing process. No species, populations or communities listed under this act were recorded on site at the time of this assessment or are considered likely to occur on this site. No Tests of Significance have been prepared for species protected by this act in relation to the proposed development.

8. Assessment of the Biodiversity Impact

Considering the information detailed above that has been summarised from information collected during field and desktop investigations and assessments of significance for threatened species and communities the following final assessments are made.

8.1. Direct Impacts

The proposal will result in the 13ha subject site being available to transition from agricultural to residential.

8.2. Indirect Impacts

Operation of the subject site for residential use will increase traffic on Boureong Drive that may have minor impacts on road strike mortality of fauna. This impact is considered very minor given the low abundance and quality of habitat in the area.

As the site transitions to residential landscaping of residential dwellings will increase vegetation diversity. This will result in more animals, particularly birds using the site and be a positive impact on biodiversity.

8.3. Potential Impacts on Flora

Vegetation impacts will not significantly impact any threatened flora or endangered ecological communities.

The proposal will not involve the removal of any significant vegetation, plant habitats or significantly degrade the ecological value of the study area.

8.4. Potential Impacts on Fauna and Habitat

No areas of important habitat or unique habitat components will be removed as part of this proposal.

The impact of the proposal on fauna populations and their habitats is considered likely to be insignificant.

No listed threatened fauna or their habitats are considered at risk of impact by this proposal.

9. Impact Mitigation Measures

The following impact mitigation measures are recommended for adoption to reduce the likelihood of any negative impacts on flora and fauna associated with this proposal both in the short and long term.

9.1 Any future Development Application to subdivide Lot 4 DP 1198749 must be accompanied by a Biodiversity Assessment that;

a) Considers the specific design of the proposal &

b) Meets planning requirements for biodiversity current at the time of application

10. Conclusion

This report has assessed the flora and fauna associated with this site and the extent and nature of impacts on biodiversity of the planning proposal.

It is essential that this report's impact mitigation measures be implemented in order to manage potential weed issues on the site and ensure that adjoining areas of high biodiversity value lands are not impacted.

There are no other biodiversity issues associated with this proposal and if the impact mitigation measures recommended by this report are implemented the overall impact of this proposal on flora and fauna will be negligible.

11. References

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Appendix 1 – Threatened Matter Evaluations

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Threatened Species Evaluations

The following table present the evaluations for threatened species, endangered ecological communities and endangered populations found either

1. Within a 10km buffer of the study site in the Atlas of NSW Wildlife (Bionet).
2. Identified as potentially occurring in the area by the Commonwealth EPBC Protected Matters Search Tool.
3. Considered to have potential to occur in the landscape given habitats available

The assessment of potential for impact to the species or ecological community is based on the nature of the proposal, it's direct and indirect impacts and the ecology of the species. Where a potential impact to a threatened species, ecological community or endangered populations has been identified a *Test of Significance* for determining whether proposed development or activity is likely to significantly affect threatened species or ecological communities, or their habitats has been undertaken in line with Section 7.3 of the *Biodiversity Conservation Act 2016*.

Abbreviations

Matter status under each act, *NSW Biodiversity Conservation Act 2016* (BC Act) or the *Commonwealth Environment Protection & Biodiversity Conservation Act 1999* (EPBC Act) (depending on the table column the abbreviation is placed in) are abbreviated as follows;

- E: listed as endangered
- V: listed as vulnerable
- CE: listed as Critically Endangered
- EEC: listed as an Endangered Ecological Community
- CEEC: listed as a Critically Endangered Ecological Community
- M: Migratory Species under the EPBC Act.

References

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Species name	Habitat requirements	TSC Act	EPBC Act	Presence of habitat	Likelihood of occurrence	Potential impact
Fauna						
Birds						
Anthochaera Phrygia Regent Honeyeater	The regent honeyeater inhabits dry open forest and woodland, particularly Box-Ironbark woodland, and riparian forests of River Sheoak. These woodlands have significantly large numbers of mature trees, high canopy cover and abundance of mistletoes. The Regent Honeyeater is a generalist forager, although it feeds mainly on the nectar from a relatively small number of eucalypts that produce high volumes of nectar. Key eucalypt species include Mugga Ironbark, Yellow Box, White Box and Swamp Mahogany. Also utilises *E. microcarpa, E. punctata, E. polyanthemos, E. moluccana, Corymbia robusta, E. crebra, E. caleyi, Corymbia maculata, E. mckieana, E. macrorhyncha, E. laevopinea*, and *Angophora floribunda*. Nectar and fruit from the mistletoes *Amyema miquelii, A. pendula and A. cambagei* are also utilised. When nectar is scarce lerp and honeydew can comprise a large proportion of the diet.	CE	CE	Present, feed trees and mistletoe present landscape, not on subject site	Possible rare visitor to site	No unlikely to be impacted Proposal will not impact potential habitat
Grantiella picta Painted Honeyeater	Inhabits Boree/ Weeping Myall (*Acacia pendula*), Brigalow (*A. harpophylla*) and Box-Gum Woodlands and Box-Ironbark Forests. A specialist feeder on the fruits of mistletoes growing on woodland eucalypts and acacias. Prefers mistletoes of the genus *Amyema*. Insects and nectar from mistletoe or eucalypts are occasionally eaten. Nest from spring to autumn in a small, delicate nest hanging within the outer canopy of drooping eucalypts, she-oak, paperbark or mistletoe branches.	V	V	Present, woodland habitat and mistletoe present in landscape	Possible occasional visitor	No unlikely to be impacted Proposal will not significantly impact potential habitat
Melithreptus gularis gularis Black-chinned Honeyeater	Occupies mostly upper levels of drier open forests or woodlands dominated by box and ironbark eucalypts, especially Mugga Ironbark (*Eucalyptus sideroxylon*), White Box (*E. albens*), Inland Grey Box (*E. microcarpa*), Yellow Box (*E. melliodora*), Blakely's Red Gum (*E. blakelyi*) and Forest Red Gum (*E. tereticornis*). Also inhabits open forests of	V		Absent	Unlikely	No

Species name	Habitat requirements	TSC Act	EPBC Act	Presence of habitat	Likelihood of occurrence	Potential impact
(eastern subspecies)	smooth-barked gums, stringybarks, ironbarks, river sheoaks (nesting habitat) and tea-trees. Feeding territories are large making the species locally nomadic. The Black-chinned Honeyeater tends to occur in the largest woodland patches in the landscape as birds forage over large home ranges of at least 5 hectares.					
Botaurus poiciloptilus Australasian Bittern	Favours permanent freshwater wetlands with tall, dense vegetation, particularly bullrushes (*Typha* spp.) and spikerushes (*Eleocharis* spp.). Hides during the day amongst dense reeds or rushes and feed mainly at night on frogs, fish, yabbies, spiders, insects and snails.		E	Absent	Unlikely	No
Calidris ferruginea Curlew Sandpiper	The curlew sandpiper generally occupies littoral and estuarine habitats, and in New South Wales is mainly found in intertidal mudflats of sheltered coasts. It also occurs in non-tidal swamps, lakes and lagoons on the coast and sometimes inland. It forages in or at the edge of shallow water, occasionally on exposed algal mats or waterweed, or on banks of beach-cast seagrass or seaweed.		CE,M	Absent	Unlikely	No
Callocephalon fimbriatum Gang-gang Cockatoo	In spring and summer, the species is generally found in tall mountain forests and woodlands, particularly in heavily timbered and mature wet sclerophyll forests. In autumn and winter, the species often moves to lower altitudes in drier more open eucalypt forests and woodlands, particularly box-gum and box-ironbark assemblages, or in dry forest in coastal areas and often found in urban areas. May also occur in sub-alpine Snow Gum (*Eucalyptus pauciflora*) woodland and occasionally in temperate rainforests. Favours old growth forest and woodland attributes for nesting and roosting. Feed mainly on seeds of native and introduced trees and shrubs, with a preference for eucalypts, wattles and introduced hawthorns. They will also eat berries, fruits, nuts and insects and their larvae. Nests are located in hollows that are 10 cm in diameter or larger and at least 9 m above the ground in eucalypts.	V		Absent	Unlikely	No
Calyptorhynchus lathami Glossy Black-Cockatoo	Inhabits open forest and woodlands of the coast and the Great Dividing Range where stands of sheoak occur. Black Sheoak (*Allocasuarina littoralis*) and Forest Sheoak (*A. torulosa*) are important foods. Inland populations feed on a wide range of sheoaks, including Drooping	V		Absent	Unlikely	No

Species name	Habitat requirements	TSC Act	EPBC Act	Presence of habitat	Likelihood of occurrence	Potential impact
	Sheoak, *Allocasuaraina diminuta*, and *A. gymnathera*. Belah (*Casuarina cristata*) is also utilised and may be a critical food source for some populations. Feeds almost exclusively on the seeds of several species of she-oak (*Casuarina* and *Allocasuarina* species), shredding the cones with the massive bill. Dependent on large hollow-bearing eucalypts for nest sites.					
Glossopsitta pusilla Little Lorikeet	Forages primarily in the canopy of open *Eucalyptus* forest and woodland, yet also finds food in *Angophora, Melaleuca* and other tree species. Riparian habitats are particularly used, due to higher soil fertility and hence greater productivity. Isolated flowering trees in open country, e.g. paddocks, roadside remnants and urban trees also help sustain viable populations of the species. Feeds mostly on nectar and pollen, occasionally on native fruits such as mistletoe, and only rarely in orchards. Roosts in treetops, often distant from feeding areas. Nests in proximity to feeding areas if possible, most typically selecting hollows in the limb or trunk of smooth-barked Eucalypts. Entrance is small (3 cm) and usually high above the ground (2–15 m). Riparian trees often chosen, including species like *Allocasuarina*.	V		Present in landscape	Unlikely but may pass through site	No unlikely to be impacted Proposal will not significantly impact potential habitat
Lathamus discolour Swift Parrot	On the Australian mainland they occur in areas where eucalypts are flowering profusely or where there are abundant lerp (from sap-sucking bugs) infestations. Favoured feed trees include winter flowering species such as Swamp Mahogany *Eucalyptus robusta*, Spotted Gum *Corymbia maculata*, Red Bloodwood *C. gummifera*, Mugga Ironbark *E. sideroxylon*, and White Box *E. albens*. Commonly used lerp infested trees include Inland Grey Box *E. microcarpa*, Grey Box *E. moluccana* and Blackbutt *E. pilularis*. Return to some foraging sites on a cyclic basis depending on food availability.	E	CE	Absent	Unlikely	No
Polytelis swainsonii Superb Parrot	Inhabit Box-Gum, Box-Cypress-pine and Boree Woodlands and River Red Gum Forest. In the Riverina the birds nest in the hollows of large trees (dead or alive) mainly in tall riparian River Red Gum Forest or Woodland. On the South West Slopes nest trees can be in open Box-Gum Woodland or isolated paddock trees. Species known to be used		V	Food source present in landscape	Unlikely but may pass through site	No - Potential impacts will not be to

Species name	Habitat requirements	TSC Act	EPBC Act	Presence of habitat	Likelihood of occurrence	Potential impact
	are Blakely's Red Gum, Yellow Box, Apple Box and Red Box. May forage up to 10 km from nesting sites, primarily in grassy box woodland. Feed in trees and understorey shrubs and on the ground and their diet consists mainly of grass seeds and herbaceous plants. Also eaten are fruits, berries, nectar, buds, flowers, insects and grain.					habitat present.
Chthonicola sagittata Speckled Warbler	The Speckled Warbler lives in a wide range of *Eucalyptus* dominated communities that have a grassy understorey, often on rocky ridges or in gullies. Typical habitat would include scattered native tussock grasses, a sparse shrub layer, some eucalypt regrowth and an open canopy. Large, relatively undisturbed remnants are required for the species to persist in an area. The diet consists of seeds and insects, with most foraging taking place on the ground around tussocks and under bushes and trees. Pairs are sedentary and occupy a breeding territory of about ten hectares, with a slightly larger home-range when not breeding.	V		Present in landscape	Unlikely, quantity of habitat is insignificant	No unlikely to be impacted Proposal will not significantly impact potential habitat
Climacteris picumnus victoriae Brown Treecreeper (eastern subspecies)	Found in eucalypt woodlands (including Box-Gum Woodland) and dry open forest of the inland slopes and plains inland of the Great Dividing Range; mainly inhabits woodlands dominated by stringybarks or other rough-barked eucalypts, usually with an open grassy understorey, sometimes with one or more shrub species; also found in mallee and River Red Gum (*Eucalyptus camaldulensis*) Forest bordering wetlands with an open understorey of acacias, saltbush, lignum, cumbungi and grasses; usually not found in woodlands with a dense shrub layer; fallen timber is an important habitat component for foraging; also recorded, though less commonly, in similar woodland habitats on the coastal ranges and plains.	V		Present in landscape	Unlikely, quantity of habitat is insignificant	No unlikely to be impacted Proposal will not significantly impact potential habitat.
Daphoenositta chrysoptera Varied Sittella	The varied sitella inhabits eucalypt forests and woodlands, especially those containing rough-barked species and mature smooth-barked gums with dead branches, mallee and *Acacia* woodland. Feeds on arthropods gleaned from crevices in rough or decorticating bark, dead branches, standing dead trees and small branches and twigs in the tree canopy.	V		Present in landscape	Possible, small quantity of habitat present	No unlikely to be impacted Proposal will not

Species name	Habitat requirements	TSC Act	EPBC Act	Presence of habitat	Likelihood of occurrence	Potential impact
						significantly impact potential habitat
Artamus cyanopterus cyanopterus Dusky Woodswallow	Dusky woodswallows are widespread in eastern, southern and south western Australia. The species occurs throughout most of New South Wales, but is sparsely scattered in, or largely absent from, much of the upper western region. Most breeding activity occurs on the western slopes of the Great Dividing Range. They inhabit dry, open eucalypt forests and woodlands, including mallee associations, with an open or sparse understorey of eucalypt saplings, acacias and other shrubs, and ground-cover of grasses or sedges and fallen woody debris. It has also been recorded in shrublands, heathlands and very occasionally in moist forest or rainforest. Also found in farmland, usually at the edges of forest or woodland. Dusky woodswallows eat invertebrates, mainly insects, which are captured whilst hovering or sallying above the canopy or over water. Also frequently hovers, sallies and pounces under the canopy, primarily over leaf litter and dead timber. Also occasionally take nectar, fruit and seed. Can be resident year round or migratory, depending on climatic conditions. In NSW, after breeding, birds migrate to the north of the state and to southeastern Queensland.	V		Absent	Unlikely	No
Melanodryas cucullata cucullata Hooded Robin (south-eastern form)	Prefers lightly wooded country, usually open eucalypt woodland, acacia scrub and mallee, often in or near clearings or open areas. Requires structurally diverse habitats featuring mature eucalypts, saplings, some small shrubs and a ground layer of moderately tall native grasses. Often perches on low dead stumps and fallen timber or on low-hanging branches. Territories range from around 10 ha during the breeding season, to 30 ha in the non-breeding season.	V		Absent	Unlikely	No
Hieraaetus morphnoides Little Eagle	Occupies open eucalypt forest, woodland or open woodland. Sheoak or *Acacia* woodlands and riparian woodlands of interior NSW are also used. Nests in tall living trees within a remnant patch, where pairs	V		Present in landscape	Possible, habitat present –	No unlikely to be impacted

Species name	Habitat requirements	TSC Act	EPBC Act	Presence of habitat	Likelihood of occurrence	Potential impact
	build a large stick nest in winter. Lays two or three eggs during spring, and young fledge in early summer. Preys on birds, reptiles and mammals, occasionally adding large insects and carrion.				nearby Bionet records	Proposal will not significantly impact potential habitat
Haliaeetus leucogaster White Bellied Sea Eagle	The White-bellied Sea-Eagle is a large eagle that has long broad wings and a short, wedge-shaped tail, it is distributed around the Australian coastline, including Tasmania, and well inland along rivers and wetlands of the Murray Darling Basin. It is widespread along the east coast, and along all major inland rivers and waterways. Habitats require the presence of large areas of open water including larger rivers, swamps, lakes, and the sea. Occurs at sites near the sea such as around bays and inlets, beaches, reefs, lagoons, estuaries and mangroves; and at, or in the vicinity of freshwater swamps, lakes, reservoirs, billabongs and saltmarsh. Terrestrial habitats include coastal dunes, tidal flats, grassland, heathland, woodland, and forest (including rainforest). Breeding habitat consists of mature tall open forest, open forest, tall woodland, and swamp sclerophyll forest close to foraging habitat. Nest trees are typically large emergent eucalypts and often have emergent dead branches or large dead trees nearby which are used as 'guard roosts'. Nests are large structures built from sticks and lined with leaves or grass.	V		No specific habitat component for this species occur	Incidental occurrence is possible	No.
Falco hypoleucos Grey Falcon	This falcon is sparsely distributed in NSW, chiefly throughout the Murray-Darling Basin, with the occasional vagrant east of the Great Dividing Range. The breeding range has contracted since the 1950s with most breeding now confined to arid parts of the range. Usually restricted to shrubland, grassland and wooded watercourses of arid and semi-arid regions, although it is occasionally found in open woodlands near the coast. Also occurs near wetlands where surface	E		No specific habitat component for this species occur	Incidental occurrence is possible	No.

Species name	Habitat requirements	TSC Act	EPBC Act	Presence of habitat	Likelihood of occurrence	Potential impact
	water attracts prey. Preys primarily on birds, especially parrots and pigeons, using high-speed chases and stoops; reptiles and mammals are also taken. Like other falcons it utilises old nests of other birds of prey and ravens, usually high in a living eucalypt near water or a watercourse; peak laying season is in late winter and early spring; two or three eggs are laid.					
Falco subniger Black Falcon	Widely but sparsely distributed in New South Wales, mostly occurring in inland regions. Some reports of 'Black Falcons' on the tablelands and coast of New South Wales are likely to be referable to the Brown Falcon. In New South Wales there is assumed to be a single population that is continuous with a broader continental population, given that falcons are highly mobile, commonly travelling hundreds of kilometres. The Black Falcon occurs as solitary individuals, in pairs, or in family groups of parents and offspring.	V		No specific habitat component for this species occur	Incidental occurrence is possible	No.
Circus assimilis Spotted Harrier	Occurs throughout the Australian mainland, except in densely forested or wooded habitats of the coast, escarpment and ranges, and rarely in Tasmania. Individuals disperse widely in NSW and comprise a single population. Occurs in grassy open woodland including Acacia and mallee remnants, inland riparian woodland, grassland and shrub steppe. It is found most commonly in native grassland, but also occurs in agricultural land, foraging over open habitats including edges of inland wetlands. Builds a stick nest in a tree and lays eggs in spring (or sometimes autumn), with young remaining in the nest for several months. Preys on terrestrial mammals (eg bandicoots, bettongs, and rodents), birds and reptile, occasionally insects and rarely carrion.	V		No specific habitat component for this species occur	Incidental occurrence is possible	No.
Ninox connivens Barking Owl	Inhabits woodland and open forest, including fragmented remnants and partly cleared farmland. It is flexible in its habitat use, and hunting can extend in to closed forest and more open areas. Sometimes able to successfully breed along timbered watercourses in heavily cleared habitats (e.g. western NSW) due to the higher density of prey on these fertile soils. Roost in shaded portions of tree canopies, including tall	V		Absent	Unlikely	No

Species name	Habitat requirements	TSC Act	EPBC Act	Presence of habitat	Likelihood of occurrence	Potential impact
	midstorey trees with dense foliage such as *Acacia* and *Casuarina* species. Preferentially hunts small arboreal mammals such as Squirrel Gliders and Ringtail Possums, but when loss of tree hollows decreases these prey populations the owl becomes more reliant on birds, invertebrates and terrestrial mammals such as rodents and rabbits. Requires very large permanent territories in most habitats due to sparse prey densities. Monogamous pairs hunt over as much as 6000 hectares, with 2000 hectares being more typical in NSW habitats.					
Ninox strenua Powerful Owl	The Powerful Owl inhabits a range of vegetation types, from woodland and open sclerophyll forest to tall open wet forest and rainforest. It requires large tracts of forest or woodland habitat but can occur in fragmented landscapes as well. It roosts by day in dense vegetation comprising species such as Turpentine *Syncarpia glomulifera*, Black She-oak *Allocasuarina littoralis*, Blackwood *Acacia melanoxylon*, Rough-barked Apple *Angophora floribunda*, Cherry Ballart *Exocarpus cupressiformis* and a number of eucalypt species. The main prey items are medium-sized arboreal marsupials, particularly the Greater Glider, Common Ringtail Possum and Sugar Glider. As most prey species require hollows and a shrub layer, these are important habitat components for the owl. In good habitats 400 ha can support a pair of Powerful Owls; where hollow trees and prey have been depleted the owls need up to 4000 ha. Powerful Owls nest in large tree hollows (at least 0.5 m deep), in large eucalypts (diameter at breast height of 80-240 cm) that are at least 150 years old.	V		Absent	Unlikely	No
Tyto novaehollandiae Masked Owl	Lives in dry eucalypt forests and woodlands from sea level to 1100 m. A forest owl, but often hunts along the edges of forests, including roadsides. The typical diet consists of tree-dwelling and ground mammals, especially rats. Pairs have a large home-range of 500 to 1000 hectares. Roosts and breeds in moist eucalypt forested gullies, using large tree hollows or sometimes caves for nesting.	V		Absent	Unlikely	No

Species name	Habitat requirements	TSC Act	EPBC Act	Presence of habitat	Likelihood of occurrence	Potential impact
Petroica phoenicea Flame Robin	Breeds in upland tall moist eucalypt forests and woodlands, often on ridges and slopes. Prefers clearings or areas with open understoreys. The groundlayer of the breeding habitat is dominated by native grasses and the shrub layer may be either sparse or dense. Occasionally occurs in temperate rainforest, and also in herbfields, heathlands, shrublands and sedgelands at high altitudes. In winter lives in dry forests, open woodlands and in pastures and native grasslands, with or without scattered trees.	V		Present in landscape	Unlikely	No
Petroica boodang Scarlet Robin	Found from south east Queensland to south east South Australia and in Tasmania and south west Western Australia. In NSW, it occurs from the coast to the inland slopes. After breeding, some Scarlet Robins disperse to the lower valleys and plains of the tablelands and slopes. Some birds may appear as far west as the eastern edges of the inland plains in autumn and winter. This robin lives in dry eucalypt forests and woodlands. The understorey is usually open and grassy with few scattered shrubs. This species lives in both mature and regrowth vegetation. It occasionally occurs in mallee or wet forest communities, or in wetlands and tea-tree swamps. Scarlet Robin habitat usually contains abundant logs and fallen timber: these are important components of its habitat. The Scarlet Robin breeds on ridges, hills and foothills of the western slopes, the Great Dividing Range and eastern coastal regions; this species is occasionally found up to 1000 metres in altitude. The Scarlet Robin is primarily a resident in forests and woodlands, but some adults and young birds disperse to more open habitats after breeding. In autumn and winter many Scarlet Robins live in open grassy woodlands, and grasslands or grazed paddocks with scattered trees. The Scarlet Robin is a quiet and unobtrusive species which is often quite tame and easily approached. Birds forage from low perche s, fence-posts or on the ground, from where they pounce on small insects and other invertebrates which are taken from the ground, or off tree trunks and logs; they sometimes forage in the shrub or canopy layer. Scarlet Robin	V		Present in landscape	Unlikely	No

Species name	Habitat requirements	TSC Act	EPBC Act	Presence of habitat	Likelihood of occurrence	Potential impact
	pairs defend a breeding territory and mainly breed between the months of July and January; they may raise two or three broods in each season. This species' nest is an open cup made of plant fibres and cobwebs and is built in the fork of tree usually more than 2 metres above the ground; nests are often found in a dead branch in a live tree, or in a dead tree or shrub. Eggs are pale greenish-, bluish- or brownish-white, spotted with brown; clutch size ranges from one to four. Birds usually occur singly or in pairs, occasionally in small family parties; pairs stay together year-round. In autumn and winter, the Scarlet Robin joins mixed flocks of other small insectivorous birds which forage through dry forests and woodlands.					
Stagonopleura guttata Diamond Firetail	Found in grassy eucalypt woodlands, including Box-Gum Woodlands and Snow Gum *Eucalyptus pauciflora* Woodlands. Also occurs in open forest, mallee, Natural Temperate Grassland, and in secondary grassland derived from other communities. Often found in riparian areas (rivers and creeks), and sometimes in lightly wooded farmland. Feeds exclusively on the ground, on ripe and partly-ripe grass and herb seeds and green leaves, and on insects (especially in the breeding season).	V		Present in landscape	Unlikely	No
Rostratula australis Australian Painted Snipe	Prefers fringes of swamps, dams and nearby marshy areas where there is a cover of grasses, lignum, low scrub or open timber. Nests on the ground amongst tall vegetation, such as grasses, tussocks or reeds.	E	E	Absent	Unlikely	No
Mammals						
Pteropus poliocephalus Grey-headed Flying-fox	Occur in subtropical and temperate rainforests, tall sclerophyll forests and woodlands, heaths and swamps as well as urban gardens and cultivated fruit crops. Roosting camps are generally located within 20 km of a regular food source and are commonly found in gullies, close to water, in vegetation with a dense canopy. Can travel up to 50 km from the camp to forage; commuting distances are more often <20 km.	V	V	Absent, suitable habitat absent.	Unlikely, may fly over site.	No

Species name	Habitat requirements	TSC Act	EPBC Act	Presence of habitat	Likelihood of occurrence	Potential impact
	Feed on the nectar and pollen of native trees, in particular *Eucalyptus, Melaleuca* and *Banksia*, and fruits of rainforest trees and vines.					
Myotis macropus Southern Myotis	Generally roost in groups of 10 - 15 close to water in caves, mine shafts, hollow-bearing trees, storm water channels, buildings, under bridges and in dense foliage. Forage over streams and pools catching insects and small fish by raking their feet across the water surface.	V		Present in landscape	Unlikely	No
Chalinolobus dwyeri Large-eared Pied Bat	It is generally rare with a very patchy distribution in NSW. Roosts in caves (near their entrances), crevices in cliffs, old mine workings and in the disused, bottle-shaped mud nests of the Fairy Martin, frequenting low to mid-elevation dry open forest and woodland close to these features. Found in well-timbered areas containing gullies. This species probably forages for small, flying insects below the forest canopy.	V	V	Present in landscape	Unlikely	No
Micronomus norfolkensis Eastern Coastal Free-tailed Bat	Found along the east coast of Australia from south Queensland to southern NSW. Occurs in dry sclerophyll forest, woodland, swamp forests and mangrove forests east of the Great Dividing Range. It roosts mainly in tree hollows but will also roost under bark or in man-made structures. Usually solitary but also recorded roosting communally, probably insectivorous.	V		Present in landscape	Unlikely	No
Falsistrellus tasmaniensis Eastern False Pipistrelle	Prefers moist habitats, with trees taller than 20 m. Generally roosts in eucalypt hollows, but has also been found under loose bark on trees or in buildings. Hunts beetles, moths, weevils and other flying insects above or just below the tree canopy.	V		Present in landscape	Unlikely	No
Miniopterus schreibersii oceanensis Large Bentwing-bat	Caves are the primary roosting habitat, but also use derelict mines, storm-water tunnels, buildings and other man-made structures. Form discrete populations centred on a maternity cave that is used annually in spring and summer for the birth and rearing of young. Maternity caves have very specific temperature and humidity regimes. Hunt in forested areas, catching moths and other flying insects above the tree top.	V		Present in landscape	Unlikely	No
Miniopterus australis	Occurs along east coast and ranges of Australia from Cape York in Queensland to Wollongong in NSW. Prefers Moist eucalypt forest, rainforest, vine thicket, wet and dry sclerophyll forest, Melaleuca	V		Present in landscape	Unlikely	No

Species name	Habitat requirements	TSC Act	EPBC Act	Presence of habitat	Likelihood of occurrence	Potential impact
Little Bentwing-bat	swamps, dense coastal forests and banksia scrub. Generally found in well-timbered areas. Little Bentwing-bats roost in caves, tunnels, tree hollows, abandoned mines, stormwater drains, culverts, bridges and sometimes buildings during the day, and at night forage for small insects beneath the canopy of densely vegetated habitats. They often share roosting sites with the Common Bentwing-bat and, in winter, the two species may form mixed clusters. Only five nursery sites /maternity colonies are known in Australia.					
Scoteanax rueppellii Greater Broad-nosed Bat	Utilises a variety of habitats from woodland through to moist and dry eucalypt forest and rainforest, though it is most commonly found in tall wet forest. Although this species usually roosts in tree hollows, it has also been found in buildings. Open woodland habitat and dry open forest suits the direct flight of this species as it searches for beetles and other large, slow-flying insects; this species has been known to eat other bat species.	V		Present in landscape	Unlikely	No
Saccolaimus flaviventris Yellow-bellied Sheathtail Bat	Occurs across northern and eastern Australia it is a rare visitor in late summer and autumn in the most southerly parts of its range, being most of Victoria, south-western NSW and adjacent South Australia. There are scattered records of this species across the New England Tablelands and North West Slopes. Forages in most habitats across its very wide range, with and without trees appears to defend an aerial territory. Seasonal movements are unknown; there is speculation about a migration to southern Australia in late summer and autumn.	V		Present in landscape	Unlikely	No
Dasyurus maculatus Spotted-tailed Quoll	Recorded across a range of habitat types, including rainforest, open forest, woodland, coastal heath and inland riparian forest, from the sub-alpine zone to the coastline. Individual animals use hollow-bearing trees, fallen logs, small caves, rock outcrops and rocky-cliff faces as den sites. A generalist predator with a preference for medium-sized (500g-5kg) mammals. Consumes a variety of prey, including gliders, possums, small wallabies, rats, birds, bandicoots, rabbits, reptiles and insects. Females occupy home ranges up to about 750 hectares and males up	V	E	Possible in landscape	Unlikely, this species requires a very large home range and while it may occur on the site from time to time this	No, no habitat affected.

Species name	Habitat requirements	TSC Act	EPBC Act	Presence of habitat	Likelihood of occurrence	Potential impact
	to 3500 hectares. Are known to traverse their home ranges along densely vegetated creeklines.				would be very rare.	
Phascolarctos cinereus Koala	Inhabits a range of eucalypt forest and woodland communities, including coastal forests, the woodlands of the tablelands and western slopes, and the riparian communities of the western plains. Feed on the foliage of more than 70 eucalypt species and 30 non-eucalypt species, but in any one area will select preferred browse species. Inactive for most of the day, feeding and moving mostly at night. Spend most of their time in trees, but will descend and traverse open ground to move between trees. Home range size varies with quality of habitat, ranging from less than two ha to several hundred hectares in size.	V	V	Present in landscape	Unlikely	No
Amphibians						
Litoria aurea Green and Golden Bell Frog	There is only one known population on the NSW Southern Tablelands. Inhabits marshes, dams and stream-sides, particularly those containing bullrushes (*Typha* spp.) or spikerushes (*Eleocharis* spp.). Optimum habitat includes water-bodies that are unshaded, free of predatory fish such as Plague Minnow (*Gambusia holbrooki*), have a grassy area nearby and diurnal sheltering sites available. Some sites, particularly in the Greater Sydney region occur in highly disturbed areas.		V	Present, dams containing rushes present.	Possible	No - Potential impacts will not be to habitat present.
Litoria booroolongensis Booroolong Frog	Live along permanent streams with some fringing vegetation cover such as ferns, sedges or grasses. Adults occur on or near cobble banks and other rock structures within stream margins. Shelter under rocks or amongst vegetation near the ground on the stream edge.	E	E	Absent, no permanent streams.	Unlikely	No
Litoria littlejohni Littlejohn's Tree Frog, Health Frog	The majority of records are from within the Sydney Basin Bioregion with only scattered records south to the Victorian border and this species has not been recorded in southern NSW within the last decade. Records are isolated and tend to be at high altitude. This species breeds in the upper reaches of permanent streams and in perched swamps. Non-breeding habitat is heath based forests and woodlands where it shelters under leaf litter and low vegetation, and hunts for invertebrate prey either in shrubs or on the ground.		V	Absent, no breeding habitat (permanent streams).	Unlikely	No

Species name	Habitat requirements	TSC Act	EPBC Act	Presence of habitat	Likelihood of occurrence	Potential impact
Reptiles						
Suta flagellum Little Whip Snake	The Little Whip Snake is found within an area bounded by Crookwell in the north, Bombala in the south, Tumbarumba to the west and Braidwood to the east. Occurs in Natural Temperate Grasslands and grassy woodlands as well as in secondary grasslands derived from clearing of woodlands. Found on well drained hillsides, mostly associated with scattered loose rocks.	V		No suitable habitat in study area	Unlikely	No
Aprasia parapulchella Pink-tailed Legless Lizard	Inhabits sloping, open woodland areas with predominantly native grassy groundlayers, particularly those dominated by Kangaroo Grass (*Themeda australis*). Sites are typically well-drained, with rocky outcrops or scattered, partially-buried rocks. Commonly found beneath small, partially-embedded rocks and appear to spend considerable time in burrows below these rocks.	V	V	Absent.	Unlikely	No
Delma impar Striped Legless Lizard	Found mainly in Natural Temperate Grassland but has also been captured in grasslands that have a high exotic component. Also found in secondary grassland near Natural Temperate Grassland and occasionally in open Box-Gum Woodland. Habitat is where grassland is dominated by perennial, tussock-forming grasses such as Kangaroo Grass *Themeda australis*, spear-grasses *Austrostipa* spp. and poa tussocks *Poa* spp., and occasionally wallaby grasses *Austrodanthonia*spp. Sometimes found in grasslands with significant amounts of surface rocks, which are used for shelter.		V	Absent, dense tussock forming grasses absent.	Unlikely	No
Varanus rosenbergi Rosenberg's Goanna	Found in heath, open forest and woodland. Associated with termites, the mounds of which this species nests in; termite mounds are a critical habitat component. Individuals require large areas of habitat. Feeds on carrion, birds, eggs, reptiles and small mammals. Shelters in hollow logs, rock crevices and in burrows, which they may dig for themselves, or they may use other species' burrows, such as rabbit warrens. Generally slow moving; on the tablelands likely only to be seen on the hottest days.	V		Absent.	Unlikely	No

Species name	Habitat requirements	TSC Act	EPBC Act	Presence of habitat	Likelihood of occurrence	Potential impact
Fish						
Macquaria australasica Macquarie Perch	While extant populations are still found across the Murray-Darling Basin and in an east coast catchment, populations are often small and geographically separated. In New South Wales, extant populations are known to occur in the upper reaches of the Lachlan, Murrumbidgee and Murray catchments in the Murray-Darling Basin, and in the Hawkesbury/Nepean catchment on the east coast. Macquarie perch spawn at sites located at the downstream end of pools, with eggs then drifting downstream to lodge amongst gravel in riffles.	E	E	Absent, no permanent waterways in study area.	No	No
Insects						
Synemon plana Golden Sun Moth	found in the area between Queanbeyan, Gunning, Young and Tumut. Occurs in Natural Temperate Grasslands and grassy Box-Gum Woodlands in which groundlayer is dominated by wallaby grasses *Austrodanthonia spp*. the bare ground between the tussocks is thought to be an important microhabitat feature for the Golden Sun Moth, as it is typically these areas on which the females are observed displaying to attract males. Adults are short-lived (one to four days) and do not feed - having no functional mouthparts; the larvae are thought to feed exclusively on the roots of wallaby grasses.	E	CE	Requires very specific habitat criteria, not present	No	No
Flora						
Diuris aequalis Buttercup Doubletail	The Buttercup Doubletail has been recorded in Kanangra-Boyd National Park, Gurnang State Forest, towards Wombeyan Caves, the Taralga - Goulburn area, and the ranges between Braidwood, Tarago and Bungendore. Recorded in forest, low open woodland with grassy understorey and secondary grassland on the higher parts of the Southern and Central Tablelands (especially on the Great Dividing Range). Leaves die back each year and resprout just before flowering. Populations tend to contain few, scattered individuals; despite extensive surveys, only about 200 plants in total, from 20 populations are known.	E	V	Absent	Unlikely	No - Potential impacts will not be to habitat present.

Species name	Habitat requirements	TSC Act	EPBC Act	Presence of habitat	Likelihood of occurrence	Potential impact
Eucalyptus aggregata Black Gum	Black Gum is found in the NSW Central and Southern Tablelands, with small isolated populations in Victoria and the ACT. Black Gum has a moderately narrow distribution, occurring mainly in the wetter, cooler and higher parts of the tablelands, for example in the Blayney, Crookwell, Goulburn, Braidwood and Bungendore districts. Grows in the lowest parts of the landscape. Grows on alluvial soils, on cold, poorly-drained flats and hollows adjacent to creeks and small rivers. Often grows with other cold-adapted eucalypts, such as Snow Gum (*Eucalyptus pauciflora*), Ribbon Gum (*E. viminalis*), Candlebark (*E. rubida*), Black Sallee (*E. stellulata*) and Swamp Gum (*E. ovata*). Black Gum usually occurs in an open woodland formation with a grassy groundlayer dominated either by River Tussock (*Poa labillardierei*) or Kangaroo Grass (*Themeda australis*), but with few shrubs.		V	Absent	Not detected during field surveys – unlikely to occur	No
Lepidium hyssopifolium Basalt Pepper-cress	In NSW, there is a small population near Bathurst, one populations at Bungendore, and one near Crookwell. In NSW the species was known to have occurred in both woodland with a grassy understorey and in grassland. The species may be a disturbance opportunist. The cryptic and non-descript nature (appearing like several weed species) of the species makes it hard to detect.		E	Absent	Not detected during field surveys – unlikely to occur	No
Leucochrysum albicans var. tricolor Hoary Sunray	In NSW and ACT, Hoary Sunray occurs in grasslands, grassy areas in woodlands and dry open forests, and modified habitats, on a variety of soil types including clays, clay loams, stony and gravely soil. Plants can be found in natural or semi-natural vegetation and grazed or ungrazed habitat. The Hoary Sunray is a low tufted to mounding perennial straw daisy. It grows to 15 cm tall and flowers in spring and summer. After flowering it dries out to rootstock.		E	Not present in the study area	Unlikely	No, potential habitat will not be impacted.
Rutidosis leptorrhynchoides Button Wrinklewort	Local populations at Goulburn, the Canberra - Queanbeyan area and at Michelago. Other populations occur in Victoria. Occurs in Box-Gum Woodland, secondary grassland derived from Box-Gum Woodland or in Natural Temperate Grassland; and often in the ecotone between the two communities.	E	E	Not present in the study area	Unlikely	No, potential habitat will not be impacted.

Species name	Habitat requirements	TSC Act	EPBC Act	Presence of habitat	Likelihood of occurrence	Potential impact
Ammobium craspedioides Yass Daisy	Found from near Crookwell on the Southern Tablelands to near Wagga Wagga on the South Western Slopes. Most populations are in the Yass region. Found in moist or dry forest communities, Box-Gum Woodland and secondary grassland derived from clearing of these communities. Grows in association with a large range of eucalypts (*Eucalyptus blakelyi, E. bridgesiana, E. dives, E. goniocalyx, E. macrorhyncha, E. mannifera, E. melliodora, E. polyanthemos, E. rubida*).	V	V	Not present in the study area	Unlikely	No, potential habitat will not be impacted.
Dodonaea procumbens Trailing Hop-bush	Creeping Hop-bush is found in the dry areas of the Monaro, between Michelago and Dalgety. Here it occurs mostly in Natural Temperate Grassland or Snow Gum Eucalyptus pauciflora Woodland. There is one population at Lake Bathurst (the northern-most occurrence of the species). Grows in Natural Temperate Grassland or fringing eucalypt woodland of Snow Gum (*Eucalyptus pauciflora*), in open bare patches where there is little competition from other species. It is found on sandy-clay soils, usually on or near vertically-tilted shale outcrops. Often occurs on roadside batters			Not present in the study area	Unlikely	No, potential habitat will not be impacted.
Pomaderris delicata Delicate Pomaderris	Delicate Pomaderris is known from only two sites; between Goulburn and Bungonia and south of Windellama. At both known sites the Delicate Pomaderris grows in dry open forest dominated by *Eucalyptus sieberi* with a dense she-oak understorey.	CE	CE	Not present in the study area	Unlikely	No, potential habitat will not be impacted.
Thesium austral Austral Toadflax	Austral Toad-flax is found in very small populations scattered across eastern NSW, along the coast, and from the Northern to Southern Tablelands. Occurs in grassland on coastal headlands or grassland and grassy woodland away from the coast. Often found in association with Kangaroo Grass (*Themeda australis*).		V	Not present in the study area	Unlikely	No, potential habitat will not be impacted.
Ecological Communities						
Natural Temperate Grassland of the Southern Tablelands of NSW and the	The ecological community is characterised by a dominance of native perennial tussock grasses. There is usually a second, lower stratum of shorter perennial and annual grasses and forbs growing between the taller tussocks, and there may be a third discontinuous stratum of even smaller forbs, grasses and cryptogams. Sedges and rushes may also occur, particularly in seasonally wet areas. A tree and shrub stratum		CE	Absent	No	No

Species name	Habitat requirements	TSC Act	EPBC Act	Presence of habitat	Likelihood of occurrence	Potential impact
Australian Capital Territory	may be present, but with only up to 10% projective foliage cover of each being present. Variation in the composition and structure of the ecological community occurs as a result of intrinsic site factors (e.g. drainage patterns, soil characteristics) and agricultural practices applied since post-1788 settlement. The major dominant or co-dominant grass species are: *Themeda triandra* (kangaroo grass), *Poa sieberiana* (snowgrass), *Poa labillardierei* (river tussock grass), *Austrostipa bigeniculata* (kneed speargrass), *Austrostipa scabra* (slender speargrass), *Bothriochloa macra* (red grass), various *Rytidosperma* species syn. *Austrodanthonia* species (wallaby grasses), *Lachnagrostis filiformis* (blowngrass) and *Sorghum leiocladum* (wild sorghum).					
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland (Commonwealth) White Box Yellow Box Blakely's Red Gum Woodland (NSW)	Box – Gum Grassy Woodlands and Derived Grasslands are characterised by a species-rich understorey of native tussock grasses, herbs and scattered shrubs, and the dominance, or prior dominance, of White Box, Yellow Box or Blakely's Red Gum trees. The tree-cover is generally discontinuous and consists of widely-spaced trees of medium height in which the canopies are clearly separated. Associated and occasionally co-dominant trees include, but are not restricted to: Grey Box (*Eucalyptus microcarpa*), Fuzzy Box (*E. conica*), Apple Box (*E. bridgesiana*), Red Box (*E. polyanthemos*), Red Stringybark (*E. macrorhyncha*), White Cypress Pine (*Callitris glaucophylla*), Black Cypress Pine (*C. enderlicheri*), Long-leaved Box (*E. goniocalyx*), New England Stringybark (*E. caliginosa*), Brittle Gum (*E. mannifera*), Candlebark (*E. rubida*), Argyle Apple (*E. cinerea*), Kurrajong (*Brachychiton populneus*) and Drooping She-oak (*Allocasuarina verticillata*). The understorey in intact sites is characterised by native grasses and a high diversity of herbs; the most commonly encountered include Kangaroo Grass (*Themeda australis*), Poa Tussock (*Poa sieberiana*), wallaby grasses (*Austrodanthonia* spp.), spear-grasses (*Austrostipa* spp.), Common Everlasting (*Chrysocephalum apiculatum*), Scrambled Eggs (*Goodenia pinnatifida*), Small St John's Wort	CEEC	CE	Modified habitat present, this community is likely to have naturally occurred on parts of the site.	Community is not present despite some species of this community occurring.	No impact.

Species name	Habitat requirements	TSC Act	EPBC Act	Presence of habitat	Likelihood of occurrence	Potential impact
	(*Hypericum gramineum*), Narrow-leafed New Holland Daisy (*Vittadinia muelleri*) and blue-bells (*Wahlenbergia* spp.). This ecological community occurs in areas where rainfall is between 400 and 1200 mm per annum, on moderate to highly fertile soils where resources such as water and nutrients are abundant.					
Tablelands Snow Gum, Black Sallee, Candlebark and Ribbon Gum Grassy Woodland in the South Eastern Highlands, Sydney Basin, South East Corner and NSW South Western Slopes Bioregions	Characterised by the presence or prior occurrence of Snow Gum, Candlebark, Ribbon Gum and/or Black Sallee trees. The trees may occur as pure stands, mixtures of the four species or in mixtures with other trees, including wattles. Commonly co-occurring eucalypts include Apple Box (*Eucalyptus bridgesiana*), Swamp Gum (*E. ovata*), Black Gum (*E. aggregata*), Mountain Gum (*E. dalrympleana*), Broad-leaved Peppermint (*E. dives*) and Narrow-leaved Peppermint (*E. radiata*) and commonly occurring tree-layer or mid-layer wattles include Blackwood (*Acacia melanoxylon*) and Silver Wattle (*A. dealbata*). The understorey in intact sites is characterised by native grasses and a high diversity of herbs; commonly encountered include Kangaroo Grass (*Themeda australis*), Common Snow-grass (*Poa sieberiana*), River Tussock (*Poa labillardierei*), Short Snow-grass (*Poa meionectes*), various wallaby-grasses (*Rytidosperma* spp.), various spear-grasses (*Austrostipa* spp.), Common Everlasting (*Chrysocephalum apiculatum*), Scaly-buttons (*Leptorhynchos squamatus*), Common Woodruff (*Asperula conferta*), Wattle Mat-rush (*Lomandra filiformis*), St John's Wort (*Hypericum gramineum*), Stinking Pennywort (*Hydrocotyle laxiflora*) and Slender Tick-trefoil (*Desmodium varians*). Shrubs are generally sparse or absent, though they may be locally common. Sub-shrubs (woody species <0.5 m tall) may be common. The most common shrubs and sub-shrubs include Gruggly-bush (*Melicytus* sp. 'Snowfields'), Urn Heath (*Melichrus urceolatus*), Sweet Bursaria (*Bursaria spinosa*) and Mountain Mirbelia (*Mirbelia oxylobioides*).	EEC		Absent	No	No

Species name	Habitat requirements	TSC Act	EPBC Act	Presence of habitat	Likelihood of occurrence	Potential impact
Tableland Basalt Forest in the Sydney Basin and South Eastern Highlands Bioregions	Tableland Basalt Forest is dominated by an open eucalypt canopy of variable composition. *Eucalyptus viminalis, E. radiata, E. dalrympleana* subsp. *dalrympleana* and *E. pauciflora* may occur in the community in pure stands or in varying combinations. The community typically has an open canopy of eucalypts with sparse mid-story shrubs (e.g. *Acacia melanoxylon* and *A. dealbata*) and understory shrubs (e.g. *Rubus parvifolius*) and a dense groundcover of herbs and grasses, although disturbed stands may lack either or both of the woody strata. The structure of the community varies depending on past and current disturbances, particularly fire history, clearing and grazing. Contemporary tree-dominated stands of the community are largely relics or regrowth of originally taller forests and woodlands, which are likely to have had scattered shrubs and a largely continuous grassy groundcover. At some sites, mature trees may exceed 30 m tall, although regrowth stands may be shorter than 10 m tall. Tableland Basalt Forest typically occurs on loam or clay soils associated with basalt or, less commonly, alluvium, fine-grained sedimentary rocks, granites and similar substrates that produce relatively fertile soils. Its distribution spans altitudes from approximately 600 m to 900 m above sea level, usually on undulating or hilly terrain. Mean annual rainfall varies from approximately 750 mm up to 1100 mm.	EEC		Absent	No	No
Migratory Species						
Hirundapus caudacutus White-throated Needletail	In Australia, the White-throated Needletail is almost exclusively aerial, from heights of less than 1 m up to more than 1000 m above the ground. Although they occur over most types of habitat, they are probably recorded most often above wooded areas, including open forest and rainforest, and may also fly between trees or in clearings, below the canopy, but they are less commonly recorded flying above woodland. When flying above farmland, they are more often recorded above partly cleared pasture, plantations or remnant vegetation at the edge of paddocks.		M	Absent	Unlikely, aerial species, rarely lands in Australia.	No

Species name	Habitat requirements	TSC Act	EPBC Act	Presence of habitat	Likelihood of occurrence	Potential impact
Monarcha melanopsis Black-faced Monarch	In NSW and the ACT, the species occurs around the eastern slopes and tablelands of the Great Dividing Range. The Black-faced Monarch mainly occurs in rainforest ecosystems, including semi-deciduous vine-thickets, complex notophyll vine-forest, tropical (mesophyll) rainforest, subtropical (notophyll) rainforest, mesophyll (broadleaf) thicket/ shrubland, warm temperate rainforest, dry (monsoon) rainforest and (occasionally) cool temperate rainforest.		M	Absent, suitable ecosystems absent.	Unlikely	No
Motacilla flava Yellow Wagtail	This insectivorous bird inhabits open country near water, such as wet grassland. Has been recorded in short grass, bare ground, swamp margins, sewage ponds, saltmarshes, ploughed land, town lawns. It picks small invertebrates from the ground or water surface, but may also make short flights to take prey from the air or follow grazing livestock to take insects stirred up as they feed.		M	Absent, large water bodies absent.	Unlikely	No
Myiagra cyanoleuca Satin Flycatcher	Satin Flycatchers are mainly recorded in eucalypt forests, especially wet tall sclerophyll forest, often dominated by eucalypts such as Brown Barrel, *Eucalypt fastigata*, Mountain Gum, *E. dalrympleana*, Mountain Grey Gum, Narrow-leaved Peppermint, Ribbon Gum, or occasionally Mountain Ash, *E. regnans*. Such forests usually have a tall shrubby understorey of tall acacia. In higher altitude Black Sallee, *E. stellulata*, woodlands, they are often associated with tea-trees and tree-ferns. They sometimes also occur in dry sclerophyll forests and woodlands, usually dominated by eucalypts such as Blakely's Red Gum, *E. blakelyi*, Mugga Ironbark, *E. sideroxylon*, Yellow Box, White Box, *E. albens*, Manna Gum or stringybarks, including Red Stringybark, *E.macrorhyncha* and Broad-leaved Stringybark, usually with open grassy understorey		M	Present, dry sclerophyll forests and woodlands containing preferred species occur.	Possible	No - Potential impacts will not be to habitat present.
Rhipidura rufifrons Rufous Fantail	The Rufous Fantail mainly inhabits wet sclerophyll forests, often in gullies dominated by eucalypts such as Tallow-wood (*Eucalyptus microcorys*), Mountain Grey Gum (*E. cypellocarpa*), Narrow-leaved Peppermint (*E. radiata*), Mountain Ash (*E. regnans*), Alpine Ash (*E. delegatensis*), Blackbutt (*E. pilularis*) or Red Mahogany (*E. resinifera*); usually with a dense shrubby understorey often		M	Absent	Unlikely	No

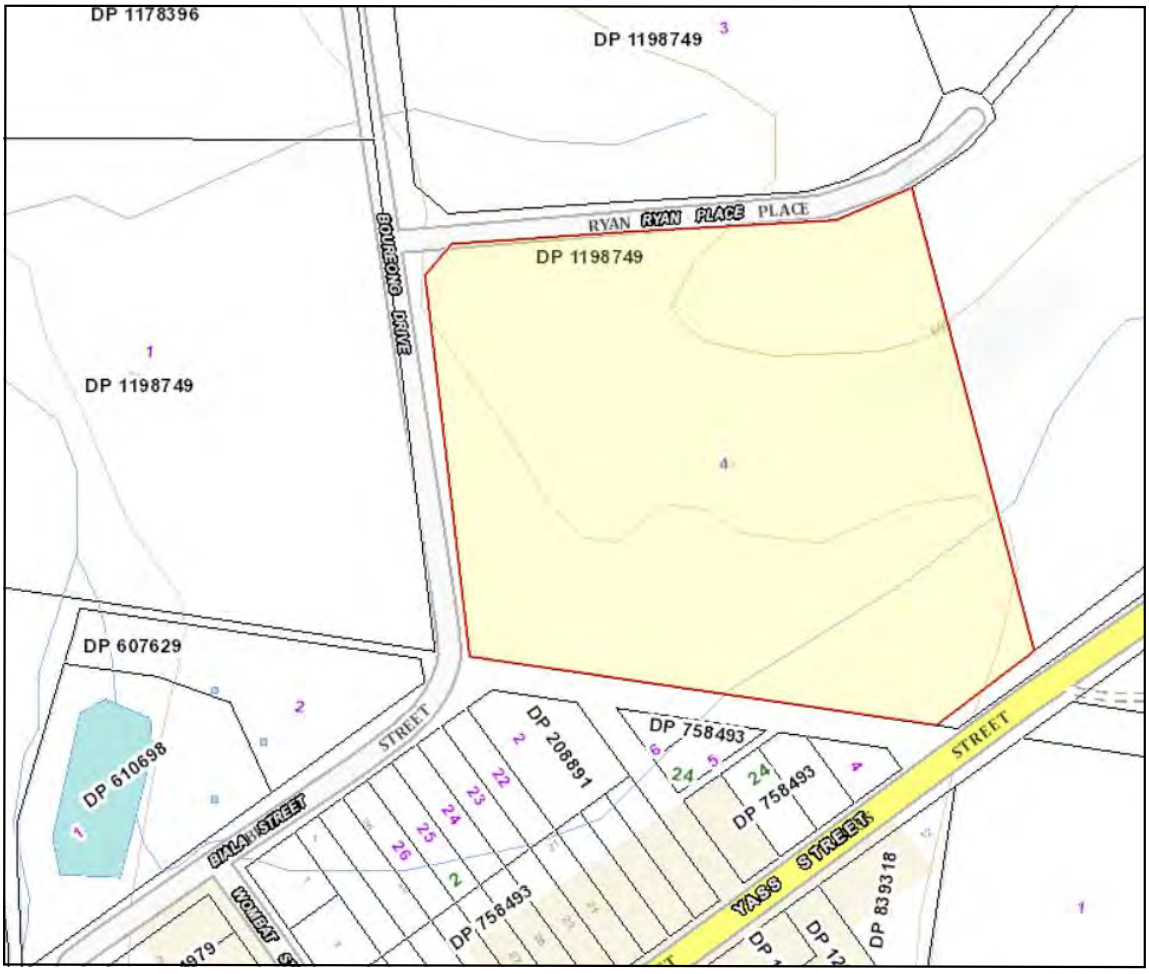
Species name	Habitat requirements	TSC Act	EPBC Act	Presence of habitat	Likelihood of occurrence	Potential impact
	including ferns. They also occur in subtropical and temperate rainforests; where they are recorded in temperate Lilly Pilly (*Acmena smithi*) rainforest, with Grey Myrtle (*Backhousia myrtifolia*), Sassafras (*Doryphora sassafras*) and Sweet Pittosporum (*Pittosporum undulatum*) subdominants. They occasionally occur in secondary regrowth, following logging or disturbance in forests or rainforests. Sometimes recorded in drier sclerophyll forests and woodlands, including Spotted Gum (*Eucalyptus maculata*), Yellow Box (*E. melliodora*), ironbarks or stringybarks, often with a shrubby or heath understorey.					
Actitis hypoleucos Common Sandpiper	The species utilises a wide range of coastal wetlands and some inland wetlands, with varying levels of salinity, and is mostly found around muddy margins or rocky shores and rarely on mudflats. Generally the species forages in shallow water and on bare soft mud at the edges of wetlands; often where obstacles project from substrate, e.g. rocks or mangrove roots. Birds sometimes venture into grassy areas adjoining wetlands.		M	Absent	Unlikely	No
Calidris acuminata Sharp-tailed Sandpiper	The Sharp-tailed Sandpiper prefers muddy edges of shallow fresh or brackish wetlands, with inundated or emergent sedges, grass, saltmarsh or other low vegetation. This includes lagoons, swamps, lakes and pools near the coast, and dams, waterholes, soaks, bore drains and bore swamps, saltpans and hypersaline saltlakes inland. They use flooded paddocks, sedgelands and other ephemeral wetlands, but leave when they dry.		M	Absent	Unlikely	No
Calidris melanotos Pectoral Sandpiper	In Australasia, the Pectoral Sandpiper prefers shallow fresh to saline wetlands. The species is found at coastal lagoons, estuaries, bays, swamps, lakes, inundated grasslands, saltmarshes, river pools, creeks, floodplains and artificial wetlands. The species is usually found in coastal or near coastal habitat but occasionally found further inland. It prefers wetlands that have open fringing mudflats and low, emergent or fringing vegetation, such as grass or samphire.		M	Absent	Unlikely	No

Species name	Habitat requirements	TSC Act	EPBC Act	Presence of habitat	Likelihood of occurrence	Potential impact
Gallinago hardwickii Latham's Snipe	Latham's Snipe occurs in a wide variety of permanent and ephemeral wetlands. They usually occur in open, freshwater wetlands that have some form of shelter (usually low and dense vegetation) nearby. They generally occupy flooded meadows, seasonal or semi-permanent swamps, or open waters, but various other freshwater habitats can be used including bogs, waterholes, billabongs, lagoons, lakes, creek or river margins, river pools and floodplains. They may be found in a variety of vegetation types or communities including tussock grasslands with rushes, reeds and sedges, coastal and alpine heathlands, lignum or tea-tree scrub, button-grass plains, alpine herbfields and open forest.		M	Absent	Unlikely	No
Pandion haliaetus Osprey	Eastern Ospreys occur in coastal habitats and terrestrial wetlands of tropical and temperate Australia and offshore islands. They are mostly found in coastal areas but occasionally travel inland along major rivers, particularly in northern Australia. They require extensive areas of open fresh, brackish or saline water for foraging. They frequent a variety of wetland habitats. They may occur over atypical habitats such as heath, woodland or forest when travelling to and from foraging sites.		M	Absent	Unlikely	No

Appendix 2 – Concept Plans

Laterals Planning

Lot 4 DP 1198749
18 Boureong Drive, Gunning
(Map Source: Six Maps)



Lot 4 DP 1198749
18 Boureong Drive, Gunning
(Map Source: Six Maps)

GUNNING LOT 4 DP 1198749

Odour Amenity Impact Assessment

Prepared for:

Laterals Engineering and Management
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BASIS OF REPORT

This report has been prepared by SLR Consulting Australia Pty Ltd (SLR) with all reasonable skill, care and diligence, and taking account of the timescale and resources allocated to it by agreement with Laterals Engineering and Management (the Client). Information reported herein is based on the interpretation of data collected, which has been accepted in good faith as being accurate and valid.

This report is for the exclusive use of the Client. No warranties or guarantees are expressed or should be inferred by any third parties. This report may not be relied upon by other parties without written consent from SLR.

SLR disclaims any responsibility to the Client and others in respect of any matters outside the agreed scope of the work.

DOCUMENT CONTROL

Reference	Date	Prepared	Checked	Authorised
610.30375-R01-v2.0	4 June 2021	Jason Shepherd	K Lawrence	Jason Shepherd

CONTENTS

DOCUMENT REFERENCES

TABLES

FIGURES

1 Introduction

SLR Consulting Australia Pty Ltd (SLR) was engaged by Laterals Engineering and Management Pty Ltd (Laterals) to prepare an amenity impact assessment (AIA) for Gunning Lot 4 DP1198749 (the Site) relating to potential odour impacts from the nearby Gunning Sewerage Treatment Plant (GSTP).

This odour AIA was commissioned to assess whether any constraints are posed by the GSTP on the proposed residential use of the Site.

The odour AIA was performed with reference to relevant standards, guidelines, and resources from across Australia, including:

- Environmental Planning and Assessment Regulation 2000 (NSW Government, 2000)
- ACT Government publication 'Separation Distance Guidelines for Air Emissions' (ACT Government, 2018)
- Environmental Protection Authority (EPA) Victoria publication 'Recommended Separation Distances for Industrial Residual Air Emissions' (EPAV, 2013)
- EPA South Australia publication 'Evaluation Distances for Effective Air Quality and Noise Management' (EPA SA, 2016)
- Gunning Sewerage Treatment Plant Pollution Incident Response Management Plan (Upper Lachlan Shire Council, undated)

2 Project Description and Site Details

2.1 Site Location and Surroundings

Gunning is a town on the Old Hume Highway, between Goulburn and Yass in the Southern Tablelands of New South Wales, Australia, about 260 km southwest of Sydney and 75 km north of Canberra. At the 2016 census, Gunning had a population of 659.

The Site is approximately 10 hectares in size, and is located immediately northeast of existing Gunning residences. It is approximately 150 m east of the GSTP.

The location of the Site relative to the GSTP and the nearest existing Gunning residences is shown in the aerial photograph presented in Figure 1.

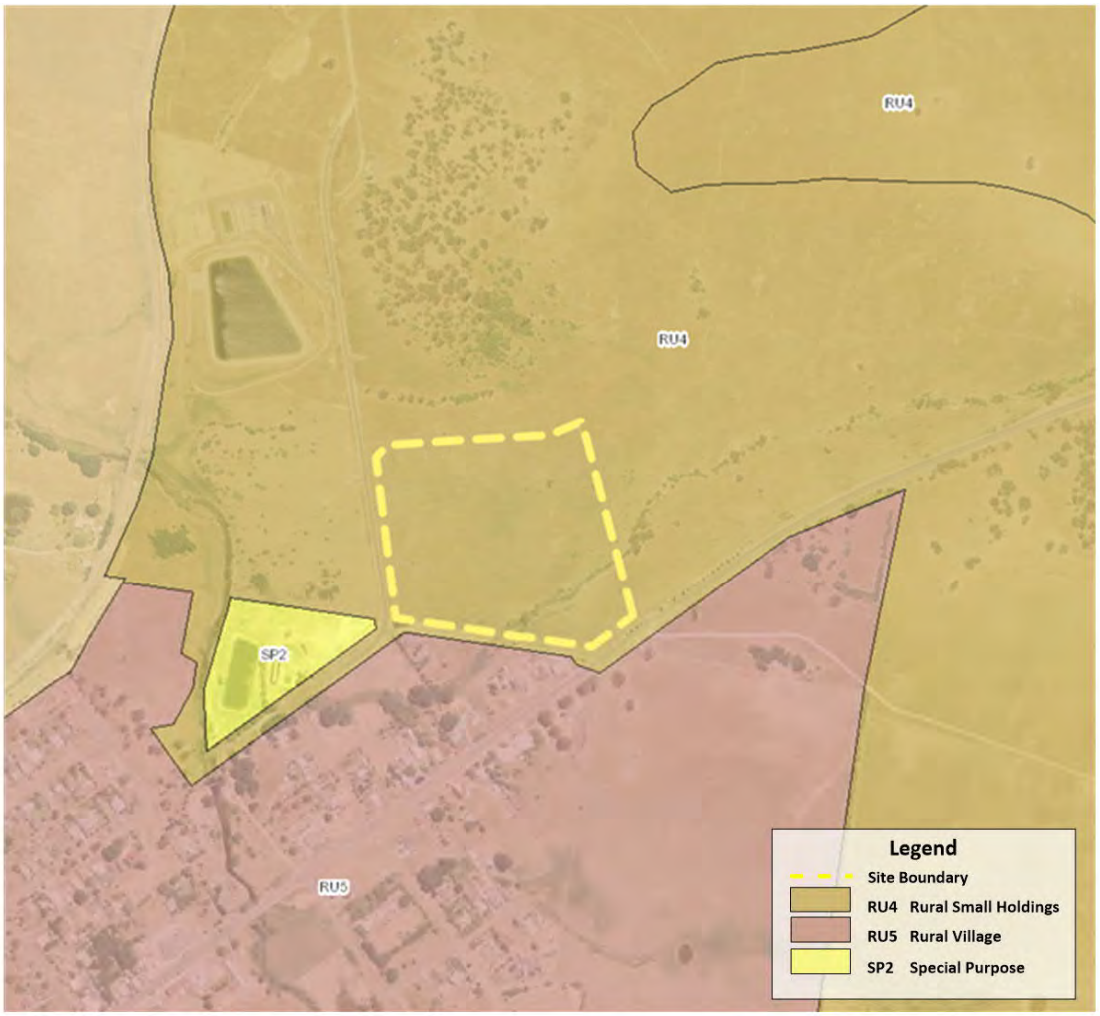
The Site is zoned as RU4 Rural Small Holdings (see Figure 2). It is bordered by RU4 and RU5 Village to the southwest (existing residences of Gunning). It is proposed to rezone the Site to RU5, the objective of which is:

> 'to provide for a range of land uses, services and facilities that are associated with a rural village. To promote development in existing towns and villages in a manner that is compatible with their urban function. To encourage well-serviced sustainable development.'

It is proposed to develop the Site with residential lots.

Figure 1 Site Location

Figure 2 Land Use Zoning



3 Relevant Odour and Amenity Standards and Guidelines

3.1 Odour

Impacts from odorous air contaminants are often nuisance-related rather than health-related. Odour performance goals guide decisions on odour management but are generally not intended to achieve 'no odour'.

The detectability of an odour is a sensory property that refers to the theoretical minimum concentration that produces an olfactory response or sensation. This point is called the odour threshold and defines one odour unit (ou). An odour goal of less than 1 ou would theoretically result in no odour impact being experienced.

In practice, the character of a particular odour can only be judged by the receiver's reaction to it, and preferably only compared to another odour under similar social and regional conditions. Based on the literature available, the level at which an odour is perceived to be a nuisance can range from 2 ou to 10 ou depending on a combination of the following factors:

- Odour quality: whether an odour results from a pure compound or from a mixture of compounds. Pure compounds tend to have a higher threshold (lower offensiveness) than a mixture of compounds.
- Source characteristics: whether the odour is emitted from a stack (point source) or from an area (diffuse source). Generally, the components of point source emissions can be identified and treated more easily than diffuse sources. Emissions from point sources can be more easily controlled using control equipment. Point sources tend to be located in urban areas, while diffuse sources are more often located in rural locations.
- Health Effects: whether a particular odour is likely to be associated with adverse health effects. In general, odours from agricultural activities are less likely to present a health risk than emissions from industrial facilities.

An example for this can be shown in a theoretical case of a bakery. A person walking past the bakery may smell the bakery odours and like these baking odours (it can be shown that people generally react positively to baking odours). However, a person living next to the bakery and who experiences the baking odours throughout their house and garden on a continuous basis may find the baking odours offensive to the point where they complain to local authorities.

Other factors may also come into play when assessing odour impacts, such as:

- Population sensitivity: any given population contains individuals with a range of sensitivities to odour. The larger a population, the greater the number of sensitive individuals it may contain.
- Background level: whether a given odour source, because of its location, is likely to contribute to a cumulative odour impact. In areas with more closely-located sources it may be necessary to apply a lower threshold to prevent offensive odour.
- Public expectation: whether a given community is tolerant of a particular type of odour and does not find it offensive, even at relatively high concentrations. For example, background agricultural odours may not be considered offensive until a higher threshold is reached than for odours from a landfill facility.

3.2 Separation/Buffer Distances

The application of minimum recommended separation distances (or 'buffer' distances) provides a valuable screening tool to judge whether a detailed assessment is required to evaluate the potential risk of conflicting land uses. Separation distances provide guidance on the appropriate level of separation between a source of emissions and sensitive land uses in order to mitigate the impacts of intended and unintended emissions on people. This approach relies on the knowledge that impacts on the environment generally decrease with increasing distance from the source of emissions. Separation distances are based on an understanding of the types of emissions associated with various industries and their potential impacts on people. These distances can vary based on the scale and size of the industry, location topography, prevailing winds and other factors.

NSW

There are no separation guidelines issued by NSW EPA, hence the following sections refer to guidelines set by other regulatory agencies in Australia. These recommended separation distances have been developed to be applied to sensitive uses, such as residential dwellings, schools, hospitals and childcare centres, and are considered appropriate for this Project (residential development).

ACT

Separation Distance Guidelines for Air Emissions (ACT Government, 2018) includes recommended separation distances for sewage treatment plants that are based on the type of installation and the size of the population that they serve, as provided in Table 1.

Table 1 ACT Separation Distance Guidelines for Air Emissions: Sewage Treatment Works

Description	Equivalent Population	Distance (m)
Mechanical/biological wastewater plants including aerated lagoons	<1,000	100
	>1,000 & <5,000	200
	>5,000 & <15,000	300
	>15,000	Individual assessment
Facultative lagoons	<1,000	150
	>1,000 & <5,000	350
	>5,000 & <15,000	700
	>15,000	Individual assessment

Victoria

Recommended Separation Distances for Industrial Residual Air Emissions' (EPAV, 2013) also provides separation distances for sewage treatment plants that are based on the type of installation and the size of the population that they serve. Table 2 provides the equations and distances to be used when considering proposals for new and existing sewage treatment plants based on the equivalent population that they will serve.

Table 2 EPAV Recommended Separation Distances for Sewage Treatment Plants

Type of Installation	Separation Distance (m; n = Equivalent Population)
Mechanical/biological wastewater plants	$10 \times n^{1/3}$
Aerobic pondage systems	$5 \times n^{1/2}$
Facultative ponds	$10 \times n^{1/2}$
Disposal areas for secondary treated effluent by spray irrigation	200
Disposal areas for secondary treated effluent by flood irrigation	50

South Australia

Evaluation Distances for Effective Air Quality and Noise Management (EPA SA, 2016) includes recommended evaluation distances for wastewater treatment plants based on the type of installation and the size of the population that they serve, which are identical to those in the ACT Separation Distance Guidelines for Air Emissions (Table 1).

Western Australia

The Separation Distances between Industrial and Sensitive Land Uses (WA EPA, 2015) states that recommended separation distances for wastewater treatment plants should be assessed on a case by case basis and advice should be sought from the authority.

4 Existing Conditions

4.1 GSTP

The village of Gunning is serviced by approximately 9 km of sewer mains and one major pump station (collects all flows from reticulation) transferring sewage to the GSTP. The GSTP is relatively small, described in the GSTP Pollution Incident Response Management Plan (Upper Lachlan Shire Council, undated) as treating approximately 100 kilolitres (kL) of sewage daily in dry weather, potentially reaching 250 kL per day during heavy rain periods. SLR understands that the GSTP has a design 1,000 persons equivalent capacity. For comparison, Schedule 3 of the Environment Planning and Assessment (NSW Government, 2000) considers a sewerage system or works a Designated Development (requiring an environmental impact statement) if it has an intended processing capacity of more than 750 kL per day (or 2,500 persons equivalent capacity), more than double the capacity of the GSTP.

Potential Odour Emissions and Impacts from the GSTP

Wastewater management processes have the potential to expose sensitive land uses to unacceptable air emissions. The GSTP may generate odour from the wastewater treatment process and sludge handling, the impacts of which could vary from being just detectable to levels that can cause nuisance and become objectionable and offensive. The main effect of environmental odour is nuisance, but stronger or persistent odours can lead to feelings of nausea, headache, loss of sleep and other symptoms of stress. Repeated exposure to nuisance levels of odour can lead to a high level of annoyance. While some people may become accustomed to odours, others may become sensitised to them.

There is little information publicly available on the design and treatment processes at the GSTP. Upper Lachlan Shire Council were contacted to confirm the operation of the GSTP however, no response was received at the time of reporting.

The main components of the GSTP identified from aerial imagery are shown in Figure 3. The main odour sources are expected to be the aeration pond and sludge lagoons . The tertiary pond, which stores treated water prior to discharge, is not expected to be a significant source of odours and has not been considered further.

Figure 3 Layout of the GSTP

Given the relatively small scale of the GSTP, the emission of odour is likely to be low, however the scale of the impact of any odour at nearby sensitive receptors (existing and proposed) will further depend on the distance and direction between source and receptor. The greater the separation between the two, the greater opportunity for the odour to disperse, becoming diluted to below detectable concentrations. As the odour plume will travel and disperse downwind of the source, the wind must travel in the direction of the receptor for the impact to reach the receptor.

4.2 Complaints History

Upper Lachlan Shire Council were contacted to request a complaints history record for the GSTP however, no response was received at the time of reporting. Previous studies by SLR in Gunning have obtained anecdotal advice that there is no significant history of odour nuisance in the area.

4.3 Meteorology

The nearest available meteorological monitoring station operated by the Bureau of Meteorology (BOM) is the Goulburn Airport automatic weather station (AWS) (station number 070330), located approximately 42 km east of the Site. Of the parameters monitored at the Goulburn Airport AWS, the most relevant to this AIA are wind speed and wind direction, as these will influence the transport of any air pollutants (including odour) from the GSTP towards the Site.

Annual wind roses for the years 2016 to 2020 compiled from data recorded by the Goulburn Airport AWS are presented in Figure 4, with seasonal wind roses for 2020 presented in Figure 5. These plots indicate the prevailing wind directions for the year and how they change between seasons. Wind roses show the frequency of occurrence of winds by direction and strength. The bars correspond to the 16 compass points (degrees from North). The bar at the top of each wind rose diagram represents winds blowing from the north (i.e. northerly winds), and so on. The length of the bar represents the frequency of occurrence of winds from that direction, and the widths of the bar sections correspond to wind speed categories, the narrowest representing the lightest winds. Thus, it is possible to visualise how often winds of a certain direction and strength occur over a long period, either for all hours of the day, or for particular periods during the day.

The following description of wind speeds references the Beaufort Wind Scale, as outlined in Table 3. Use of the Beaufort Wind Scale is consistent with terminology used by the BoM.

Table 3 Beaufort Wind Scale

Beaufort Scale #	Description	m/s	Description on land
0	Calm	0-0.5	Smoke rises vertically
1	Light air	0.5-1.5	Smoke drift indicates wind direction
2-3	Light/gentle breeze	1.5-5.3	Wind felt on face, leaves rustle, light flags extended, ordinary vanes moved by wind
4	Moderate winds	5.3-8.0	Raises dust and loose paper, small branches are moved
5	Fresh winds	8.0-10.8	Small trees in leaf begin to sway, crested wavelets form on inland waters
6	Strong winds	>10.8	Large branches in motion, whistling heard in telephone wires; umbrellas used with difficulty

Source: http://www.bom.gov.au/lam/glossary/beaufort.shtml

The annual wind roses for the five years 2016 to 2020 indicate that there is consistently a relatively high proportion of moderate and strong winds from the west-northwest, followed by winds from the east-southeast. All seasons see a similar pattern to the annual distribution, however the winter months see this pattern strengthen towards the west-northwest while the summer months experience more of a balance of winds from the two opposing directions.

During all seasons, winds from the southwest and west-southwest, which would blow emissions from the GSTP towards the Site, occur very infrequently (approximately 3% of the time). Furthermore, light winds (0 - 3 m/s) generally associated with worst case odour impacts, occur very infrequently from these directions (approximately 2% of the time).

Figure 4 Goulburn Airport AWS Annual Wind Roses (2016 - 2020)

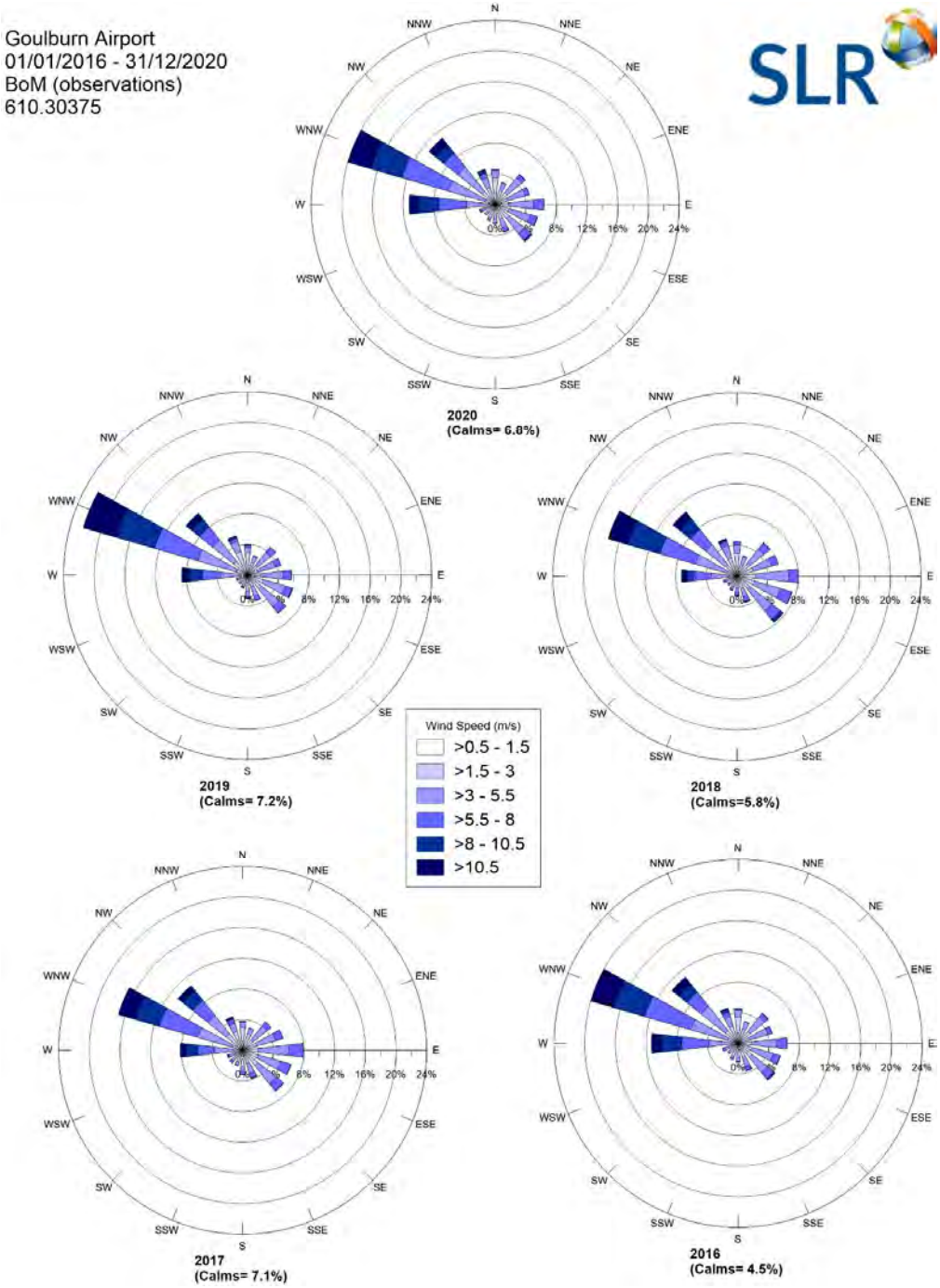
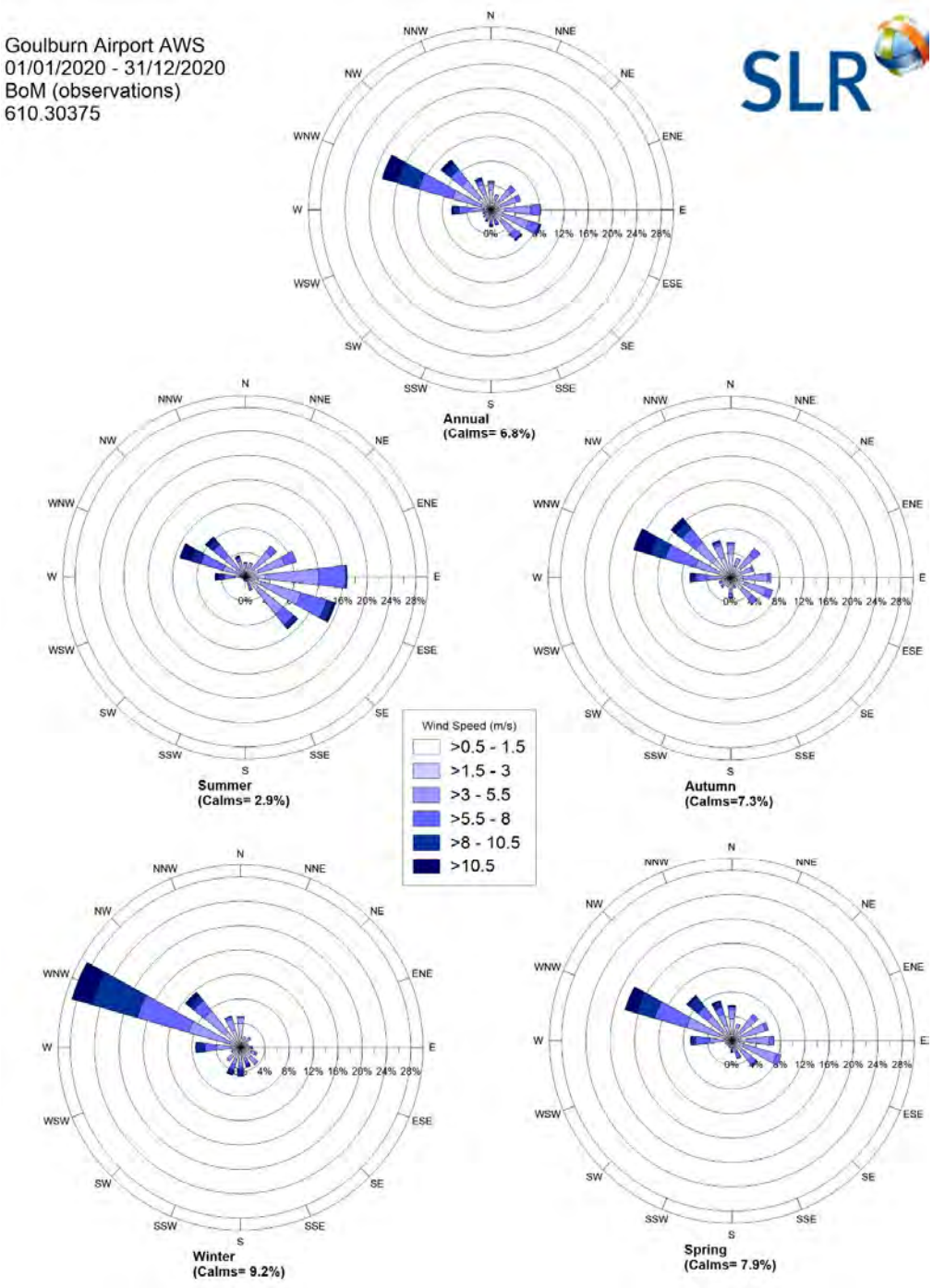


Figure 5 Goulburn Airport AWS Annual and Seasonal Wind Roses (2020)



5 Desktop Study

5.1 Qualitative Assessment

Based on the review of state guidelines on separation distances for sewerage treatment plants (Section 3.2), Table 4 provides the minimum separation distances that would be recommended for the GSTP, conservatively assuming a population of 1000 (Gunning's 2016 population was 659).[1]

Table 4 Sewerage Treatment Plant Separation Distances by State

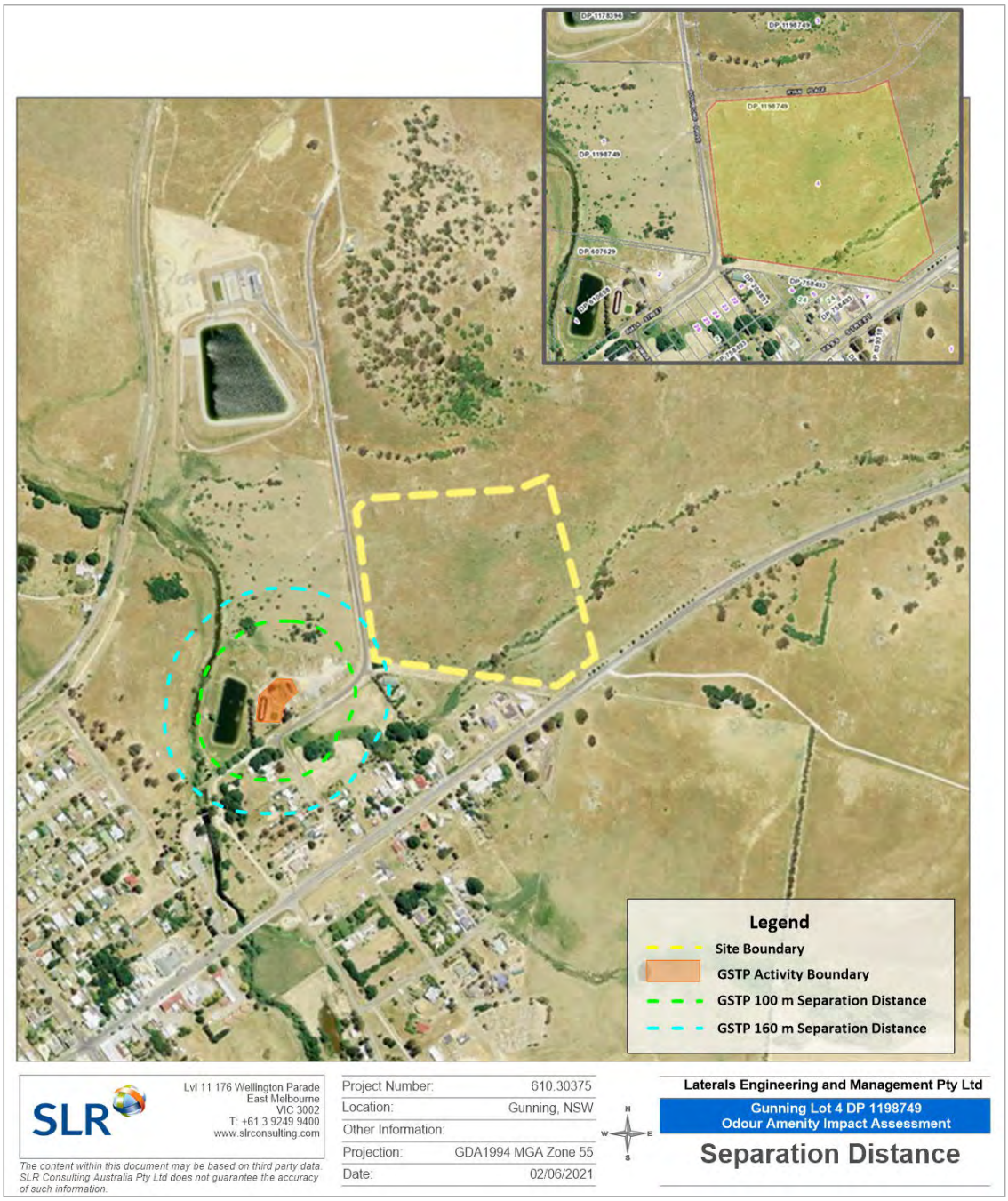
State	Type of Installation	Separation Distance (population= 1000)
ACT South Australia	Mechanical/biological wastewater plants including aerated lagoons	100
	Facultative lagoons	150
Victoria	Mechanical/biological wastewater plants	100
	Aerobic pondage systems	160
	Facultative ponds	320
	Disposal areas for secondary treated effluent by spray irrigation	200
	Disposal areas for secondary treated effluent by flood irrigation	50

The most relevant separation distances listed in Table 4 for the GSTP is considered to be those for mechanical/biological wastewater plants (100 m) and aerobic pondage systems (160 m).

EPAV advises that the distance between an industrial activity and the nearest sensitive land use should be measured from the 'activity boundary' of the industrial activity, a convex polygon that includes all current or proposed industrial activities from which residual air emissions may arise. Figure 6 illustrates the approximate extent of the separating distances of 100 and 160 m from the relevant activity and shows that the nearest point of the Site boundary is beyond the 100 m separation distance and just inside the 160 m separation distance. It is noted that there are existing residences directly to the south of the GSTP that lie within both these separation distances.

[1] Note: The peak inflow to the GSTP of 250 kL per day (see Section 4.1) would also be equivalent to an equivalent population of 833 based on the conversion given in Schedule 3 of the Environment Planning and Assessment (NSW Government, 2000) pf 750 kL per day being comparable to a 2,500 persons equivalent capacity.

Figure 6 GSTP Recommended Separation Distance



5.2 Additional Considerations

Light winds blowing from the southwest and west-southwest would be required for odour emissions from the GTSP to be transported to the Site. As indicated by the wind roses provided in Section 4.3, winds from these directions occur approximately 3% of the time annually, rising to 5% of the time over the winter months. Thus, for the majority of the time, winds will disperse any odour emissions from the GSTP in directions away from the Site. Winds blowing emissions towards the Site can be expected to occur with a frequency equivalent to approximately one day every month.

6 Conclusion

In the absence of separation guidelines issued by NSW EPA, a conservative separation distance of 160 m has been adopted for the GSTP using guidelines set by other regulatory agencies in Australia. The Site predominantly lies outside this separation distance, suggesting that there is a low risk of potential adverse amenity impacts on the Site from the GSTP. In addition, prevailing wind conditions suggest that the Site would be downwind of the GSTP very infrequently, and therefore the likelihood of any odour plume from the GSTP intersecting the Site could be considered unlikely.

Based on the above, the risk of odour impacts at the Site is considered low and therefore suitable for sensitive land use as proposed.

7 References

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18 Boureong Drive, Gunning

(Lot 4 DP 1198749)

Flood Impact and Risk Assessment (FIRA)

Revision 1
October 2024

Catchment Simulation Solutions

18 Boureong Drive, Gunning
(Lot 4 DP 1198749)

Flood Impact and Risk Assessment (FIRA)

Client	Client Representative
Stuart and Catherine Duke	Robert Mowle (Laterals Engineering and Management)

REVISION/REVIEW HISTORY

Revision #	Description	Prepared by	Reviewed by
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1 INTRODUCTION

Upper Lachlan Shire Council, on behalf of Stuart and Catherine Duke, is proposing to amend the Upper Lachlan Local Environment Plan (LEP) 2010 for a large portion of the land located at 18 Boureong Drive (Lot 4 DP 1198749), Gunning (herein referred to as 'the site'). The location of the site is shown in **Figure 1**, which is enclosed in **Appendix A**. **Figure 1** shows that the existing site contains a residential dwelling and two sheds in the northern-most corner, with the remainder of the site undeveloped with rural pasture and scattered trees.

The Planning Proposal will involve rezoning the site from RU4 Primary Production Small Lots zone to RU5 Village zone and reduce the minimum lot size from 10ha to 1,000m^2 to enable the development of dwelling houses. The very southern portion of the site (where an existing watercourse is located) will be rezoned to C3 (environmental management) and contain three lots. Another proposed lot in the south-western corner of the site will be zoned MU1 (mixed use), and another lot on the western boundary zoned RE1 (public recreation).

The Planning Proposal has been through the Department of Planning and Environment (DPE) – Biodiversity and Conservation Regional Delivery gateway process which has identified that a Flood Impact and Risk Assessment (FIRA) is required to support the rezoning including the need to demonstrate consistency with Section 9.1 Ministerial Direction 4.1 *Flooding*. The NSW SES has also provided feedback on the potential rezoning and has requested additional information be included within the FIRA to demonstrate emergency management and planning principles can be achieved.

In recognition of the requested information, Catchment Simulation Solutions has prepared the current FIRA to address the following specific requirements:

- The impact of flooding on the potential future development, including flood behaviour along the watercourse passing through the site, across the range of possible floods up to the Probable Maximum Flood (PMF)
- The impact of flooding on the safety of people for the full range of possible floods, including isolation risk, frequency, duration and timing of isolation.
- Appropriate access/egress routes
- The implications of climate change on flooding – particularly increased rainfall intensity on flood behaviour
- Appropriate zoning of riparian lands and lands within the flood planning area, and
- Consistency with Section 9.1 Ministerial Direction 4.1 *Flooding*

The following report summarises the outcomes of the FIRA.

2 FLOOD BEHAVIOUR

2.1 General

In order to understand the potential impact of flooding on the rezoning, it is first necessary to define flood behaviour for "existing" conditions. Existing flood behaviour was previously defined across the Gunning locality as part of the '*The Village of Gunning Flood Study*' (Lyall & Associates, 2014). This includes the Meadow Creek catchment, which contains the site. The flood study included the development of a RORB model to simulate rainfall-runoff (i.e., hydrologic) processes as well as a TUFLOW model to simulate flood hydraulics.

The RORB and TUFLOW models were provided by Upper Lachlan Shire Council (via the SES Flood Data Portal) for use as part of the assessment. However, before they were used, a review of each model was completed to ensure they provided a suitable representation of flood behaviour in the vicinity of the site. The outcomes of the model review along with the updates that were completed to each model are detailed in Section 2.2.

Once the models were updated, they were used to simulate flood behaviour for existing topographic and development conditions. The results of the flood simulations are discussed in Section 2.3.

It was noted that the *'The Villages of Crookwell, Gunning, Collector and Taralga Floodplain Risk Management Study and Draft Plan'* (Lyall & Associates, 2017) was prepared subsequent to the '*The Village of Gunning Flood Study*' (Lyall & Associates, 2014). However, the underlying flood modelling was not updated. Therefore, the RORB and TUFLOW models are identical in both studies and reflect the most contemporary computer models for the local catchment.

2.2 Model Updates

2.2.1 RORB Model

As discussed, a RORB model was used to simulate hydrologic processes across the Gunning locality as part of '*The Village of Gunning Flood Study*' (Lyall & Associates, 2014) and *'The Villages of Crookwell, Gunning, Collector and Taralga Floodplain Risk Management Study and Draft Plan'* (Lyall & Associates, 2017). The RORB model was reviewed as part of the current assessment, and it was determined that model files for only a limited set of design storms were provided (i.e., 20 year ARI, 100 year ARI and PMF) and no model files were provided for the 200 year and 500 year ARI events.

Therefore, it was necessary to create modified RORB input files for additional flood events to cover the full range of potential floods across the Gunning locality, as well as additional durations that may produce critical flood behaviour through the development site. In this regard, RORB input files were generated to reflect:

- Adoption of the 'future' catchment conditions RORB hydrologic scenario that was developed as part of '*The Village of Gunning Flood Study*' (Lyall & Associates, 2014) to

reflect a conservative approach to flow generation at the site. This assumed full development based on that allowable by the land use zoning at the time the study was prepared.

- Retaining of the initial and continuing losses, kc and m parameters from Table 3.3 of '*The Village of Gunning Flood Study*' (Lyall & Associates, 2014) for the 20, 100 and 200 year ARI events. Adoption of these parameters were also applied to 500 year and PMF events (no better guidance was available).
- Generation of input files for flood durations ranging from 60 minutes to 540 minutes (60, 90, 120, 180, 270, 360, 540 minutes, noting a maximum of 360 minutes was applied for the PMF).

The RORB model was then used to generate revised design flows for the 20 year, 100 year, 200 year and 500 year ARI events, as well as the PMF.

2.2.2 TUFLOW Model

The TUFLOW hydraulic model was also reviewed within the vicinity of the development site. This review indicated that a number of changes to the model would be necessary to provide enhanced detail for the current study. The updates to the existing model included:

- Topography: The existing TUFLOW model utilises LiDAR collected pre 2014 to define the topography across the model extent. To supplement this topographic data, detailed site survey collected by Southern Cross Consulting Surveyors in July 2021 was provided and included within the TUFLOW model to allow the existing topography across the development sites to be represented more precisely. A copy of the survey is included within **Appendix B**.
- Inflow Locations: The existing TUFLOW model applied inflows to the watercourse within the southern portion of the site at a location roughly halfway through the site. To provide a representation of flood behaviour throughout the entire watercourse within the site, this inflow boundary was relocated 250 metres further upstream (170 metres upstream of the eastern lot boundary).
- Inflows: The inflows described in Section 2.2.1 were applied to the TUFLOW model.
- Direct Rainfall: The TUFLOW model utilised a 'rainfall on grid' approach across the township of Gunning (which did not include the development site. The rainfall depths for the 'rainfall on grid' portion of the TUFLOW model for all ARIs and durations were defined based on procedures outlined in ARR1987 for the Gunning locality (in line with those adopted in '*The Village of Gunning Flood Study*' (Lyall & Associates, 2014)). The development site remained outside of the 'rainfall on grid' portion of the TUFLOW model.

The modified TUFLOW layout is shown on **Figure 2**.

2.3 Results

The updated TUFLOW model was used to simulate flood behaviour for the 20 year, 100 year, 200 year and 500 year ARI events, as well as the PMF for durations ranging from 60 minutes to 540 minutes (noting a maximum of 360 minutes was applied for the PMF based on limits set out in the Bureau of Meteorology's *'Generalised Short Duration Method'* (Bureau of Meteorology, 2003)).

Flood mapping was prepared for each design flood by enveloping the peak flood behaviour from all durations for that event, and is presented in **Appendix A** as follows:

- Peak floodwater depths and levels: **Figures 3** to **7**.
- Peak velocity: **Figures 8** to **12**.

Figure 3 through **Figure 7** shows that a watercourse passes into the site across the eastern site boundary, and travels in a south-westerly direction before ultimately discharging from the site along the southern site boundary. Typical water depths along the watercourse vary from 0.3 metres in the 20 year ARI event, to 0.5 metres in the 500 year ARI event and up to 1.5 metres in the PMF. However, the terrain adjacent to the watercourse is incised resulting in inundation extents being contained closely to the watercourse. The remainder of the site remains flood free in all events owing to the natural grade of the site, and relatively minor nature of the watercourse.

Figures 8 through **Figure 12** indicate that peak velocities can vary from 1.5m/s in the 20 year up to 4.5m/s in the PMF.

Hydraulic Categories

Hydraulic Categories for the 100 Year ARI flood and PMF were also calculated. This involved subdividing the floodplain into floodway, flood storage and flood fringe categories.

Criteria for defining hydraulic categories were established in *'The Villages of Crookwell, Gunning, Collector and Taralga Floodplain Risk Management Study and Draft Plan'* (Lyall & Associates, 2017). This included defining floodways based on criteria defined by Howells et al (2004), as follows:

- Velocity x Depth > 0.25m^2/s AND Velocity > 0.25m/s, OR
- Velocity > 1m/s.

Flood storage and flood fringe areas were subsequently defined based on (and consistent with *'The Villages of Crookwell, Gunning, Collector and Taralga Floodplain Risk Management Study and Draft Plan'* (Lyall & Associates, 2017)) as per the following:

- Flood Storage: Areas not defined as floodway and depth > 0.4m.
- Flood Fringe: Remaining areas.

These criteria were applied to the 100 Year ARI and PMF results from the updated flood modelling and the resulting hydraulic categories are presented in **Figure 13** and **14** respectively.

Figure 13 indicates that in the 100 Year ARI event, the watercourse is made up of floodway and flood storage, with small areas of flood fringe (noting that a minimum depth threshold of 0.05 metres has been adopted). Figure 14 indicates that in the PMF, the watercourse is primarily classified as floodway with small areas of flood storage ad flood fringe on the extremities of the flood extent.

Flood Hazard

To confirm the nature and extent of the flood hazard through the site, flood hazard mapping was prepared based upon flood hazard vulnerability curves presented in '*Flood Hazard – Flood risk management guideline FB03*' (NSW Government Department of Planning and Environment, 2023). The hazard curves, which are reproduced in **Plate 1**, assess the potential vulnerability of people, cars and structures to flooding based upon the depth and velocity of floodwaters at a particular location. The maximum flood hazard for each design flood are presented in **Figures 15** to **19**.

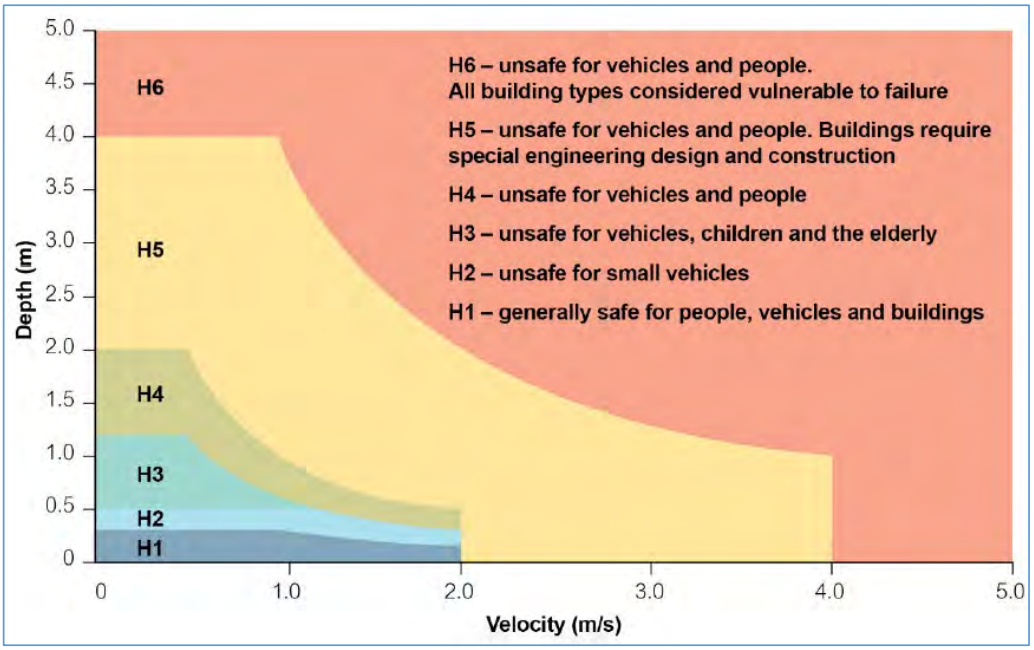


Plate 1 Flood hazard vulnerability curves (NSW Government, 2023)

Figures 15 to **19** show that the flood hazard is typically no greater than H1 in the 20 year ARI event. However, in the 100 year ARI through 500 year ARI events, a hazard of up to H5 is more common within the watercourse. At the peak of the PMF, a hazard of H5 and H6 is typical within the watercourse.

2.4 Post-Development Flood Behaviour

As previously discussed, the site is located on elevated ground, with only a small tributary of Meadows Creek traversing the lower (southern) portion of the site. A concept design for the works proposed as part of the planning proposal is provided in **Appendix C**. It shows the area where residential development is proposed is located on the elevated sections of the site away from the main watercourse (i.e., no interaction between habitable areas and floodwaters is expected during all events up to and including the PMF).

It is acknowledged that development of the site would produce additional impervious areas, which may result in additional runoff volume and higher peak discharges. In this regard, it is understood that a stormwater management strategy will be implemented as part of the

future development of the site which will appropriately manage and treat flows generated from the site, ensuring that post-development discharges from the site do not exceed that under existing conditions. Assessment of the stormwater strategy is beyond the scope of the current flood assessment and, therefore, no post-development modelling or flood impact assessment has been undertaken on the assumption that no increases in current peak discharges will occur as a result of the development of the site.

2.5 Climate Change Assessment

Climate change and, in particular, rainfall increases have the potential to impact on present-day flood behaviour. As such, it was considered important to gain an understanding of the flood behaviour that could be expected under future climate change conditions. In this regard, the 200 year and 500 year ARI flood events have been used as proxies for the 100 year ARI flood under future climate change conditions (representing increases in 100 year ARI rainfall intensity of 11% and 27% respectively). This is identical to the approach adopted in the *'The Villages of Crookwell, Gunning, Collector and Taralga Floodplain Risk Management Study and Draft Plan'* (Lyall & Associates, 2017).

Flood level difference mapping was then prepared by subtracting peak 100 year ARI flood levels from the peak 200 year and 500 year ARI flood levels. The differences are presented on **Figure 20** and **21** respectively.

Figure 20 shows that a ~11% increase in 100 year ARI rainfall intensity is predicted to increase flood levels within the site by between 0.02 and 0.06 metres, however, some localised areas can increase by up to 0.1 metres. Little to no additional flood extent is predicted.

Figure 21 indicates that a ~27% increase in 100 year ARI rainfall intensity will increase peak flood levels within the site by between 0.07 and 0.14 metres. Again, little additional inundation extent is predicted relative to present day conditions.

2.6 Blockage Assessment

No hydraulic structures are present in the immediate vicinity of the site, and therefore, uncertainty related to blockage would not impact flood behaviour at the site. Therefore, no blockage sensitivity assessment has been undertaken.

2.7 Flood Planning Level/Area

Flood planning levels (FPLs) and the flood planning area (FPA) are important tools in the management of flood risk. The flood planning area is used to define the area where flood-related development controls apply. For those areas contained within the flood planning area, the flood planning levels are frequently used to establish the elevation of key components of a development, such as minimum floor levels.

The flood planning level is typically derived by adding a freeboard to a defined flood event (most commonly the 100 year ARI flood). The freeboard is intended to account for any uncertainties in the derivation of the defined flood level. *'The Villages of Crookwell, Gunning, Collector and Taralga Floodplain Risk Management Study and Draft Plan'* (Lyall & Associates,

2017) defined a variable flood planning level/area for different sections of the floodplain, namely:

- Main Stream Flooding (MSF): 100 year ARI + 0.5 metres.
- Minor Tributary Flooding (MTF): level of the 100 year ARI across areas where depths in the 100 year ARI exceed 0.15 metres. Areas inundated that did not meet this criterion did not form part of the flood planning area.
- Major Overland Flow (MOF): level of the 100 year ARI across areas of high and low hazard floodways AND where depths in the 100 year ARI exceed 0.15 metres. Areas inundated that did not meet this criterion did not form part of the flood planning area.

On review of the definitions of the sections of the floodplain, the inundation within the site would fall within the MTF category (being a minor unnamed tributary of Meadow Creek). The flood planning level was then defined based upon the peak 100 year ARI flood level where depths exceed 0.15 metres. Areas inundated that did not meet this criterion did not form part of the flood planning area. The resulting flood planning area, together with the flood planning level (100-year ARI) contours are shown on **Figure 22**. The 100 Year ARI and PMF extents have also been shown on **Figure 22** to define significant areas of the floodplain (100 year ARI extent) and the extent of the floodplain (PMF extent).

As shown on **Figure 22**, the flood planning area is restricted within close proximity to the watercourse and falls fully within the proposed C3 zoning. Any works on the C3 zoned lots will have a covenant placed on them prohibiting any buildings within the flood affected areas.

It is noted that if the MSF (main stream flooding) criteria that was applied to the main Meadow Creek watercourse within *'The Villages of Crookwell, Gunning, Collector and Taralga Floodplain Risk Management Study and Draft Plan'* (Lyall & Associates, 2017) was applied to the watercourse through the development site, that, owing to the relatively incised terrain adjacent to the watercourse, only a small additional area on either side of the 100 year ARI extent would result. Therefore, the developable portion of the site is not sensitive to the chosen flood planning level criteria.

2.8 Emergency Response Considerations

As discussed in Section 2.2.3, and shown on **Figures 3** to **7**, no inundation of the RU5, MU1 or RE1 portions of the site is predicted in any flood event and any works on the C3 zoned lots will have a covenant placed on them prohibiting any buildings within the flood affected areas (i.e., up to and including the PMF). Therefore, all future dwellings will be elevated above all potential floods and evacuation from the site will not be necessary. However, emergency access/egress to and from the site may still be necessary (e.g., in case of a medical emergency).

In this regard, flood depth and hazard hydrographs were extracted along potential evacuation routes to/from the site. The potential evacuation routes that were identified through Gunning are shown on **Plate 2**, with the depth/hazard hydrographs presented on **Plate 3** through **Plate 6** at the following key locations:

- Location 1 - Wombat St near the intersection of Biala St (**Plate 3)**
- Location 2 - Wombat Street south of Yass Street (**Plate 4)**

- Location 3 - Collector Road south of Lerida St (**Plate 5)**, and
- Location 4 - Yass Street between Gundaroo St and Warrataw St (just west of the Meadow Creek crossing/Jack Shaw Bridge on Yass St) (**Plate 6)**

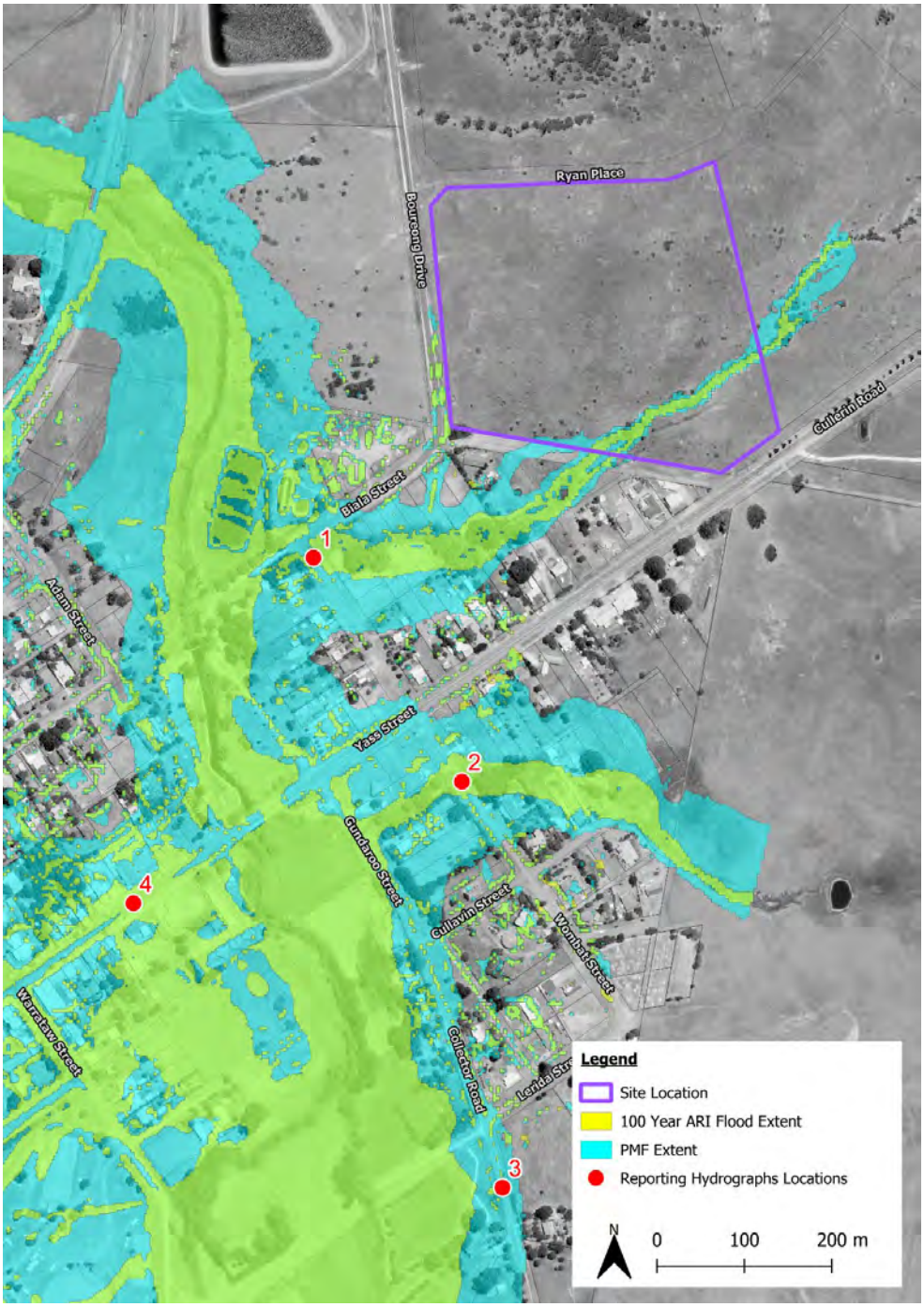


Plate 2 Locations of flood hazard/depth hydrograph extraction

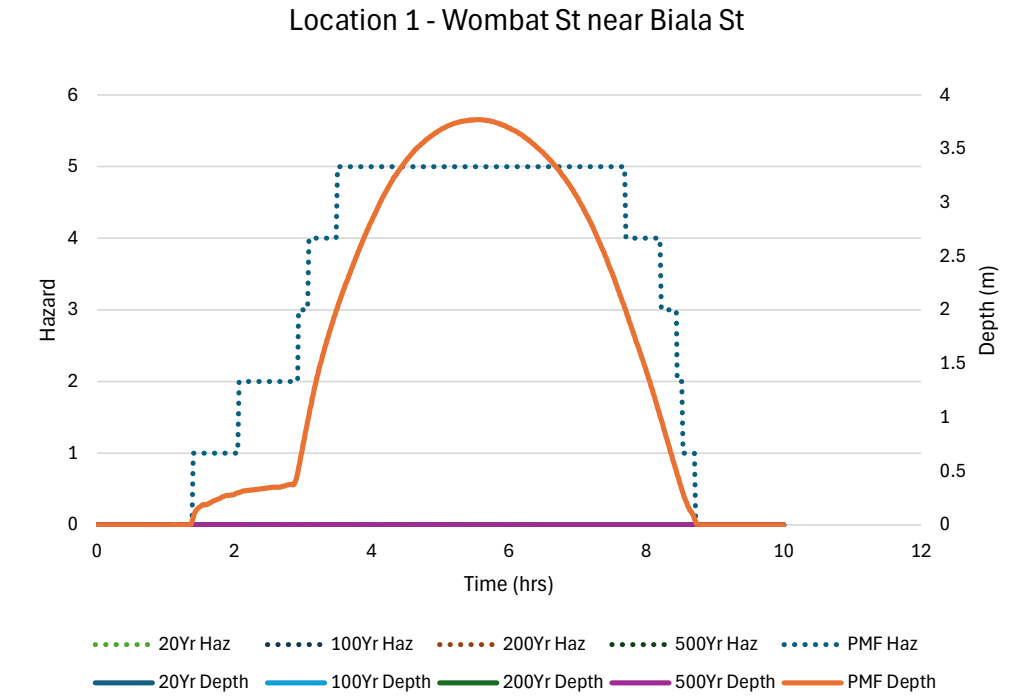


Plate 3 Hazard and depth hydrographs at Location 1

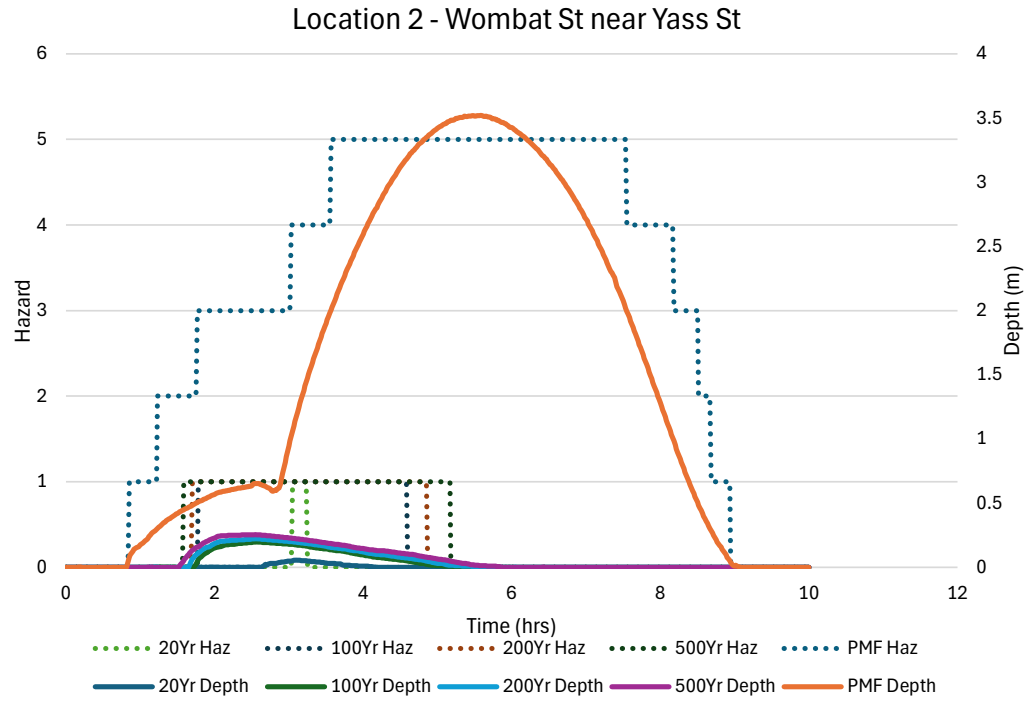


Plate 4 Hazard and depth hydrographs at Location 2

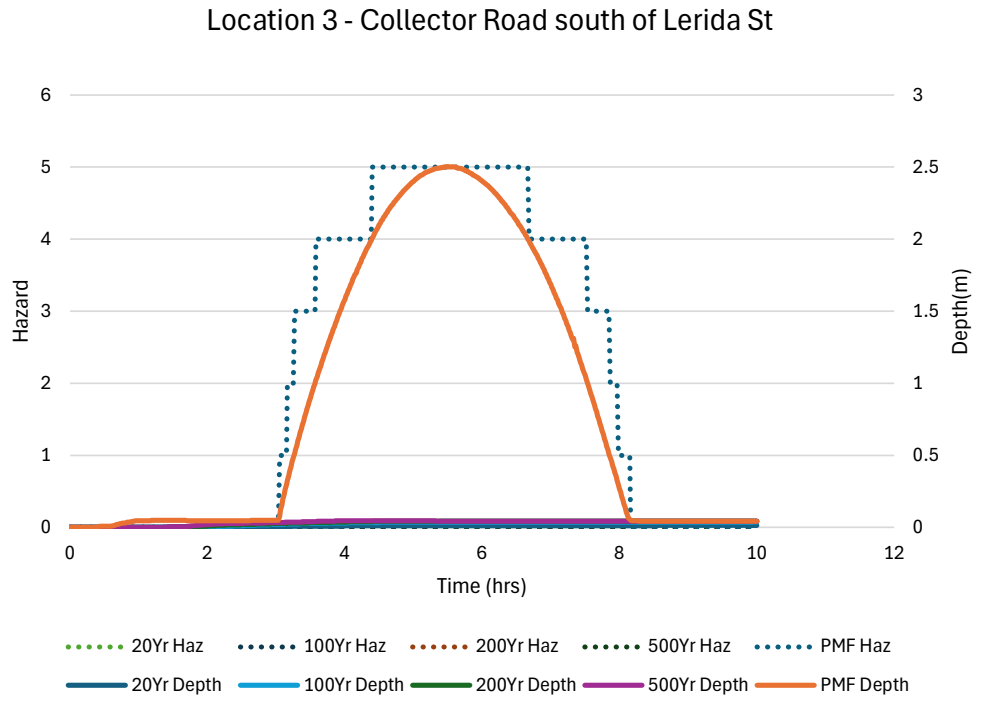


Plate 5 Hazard and depth hydrographs at Location 3

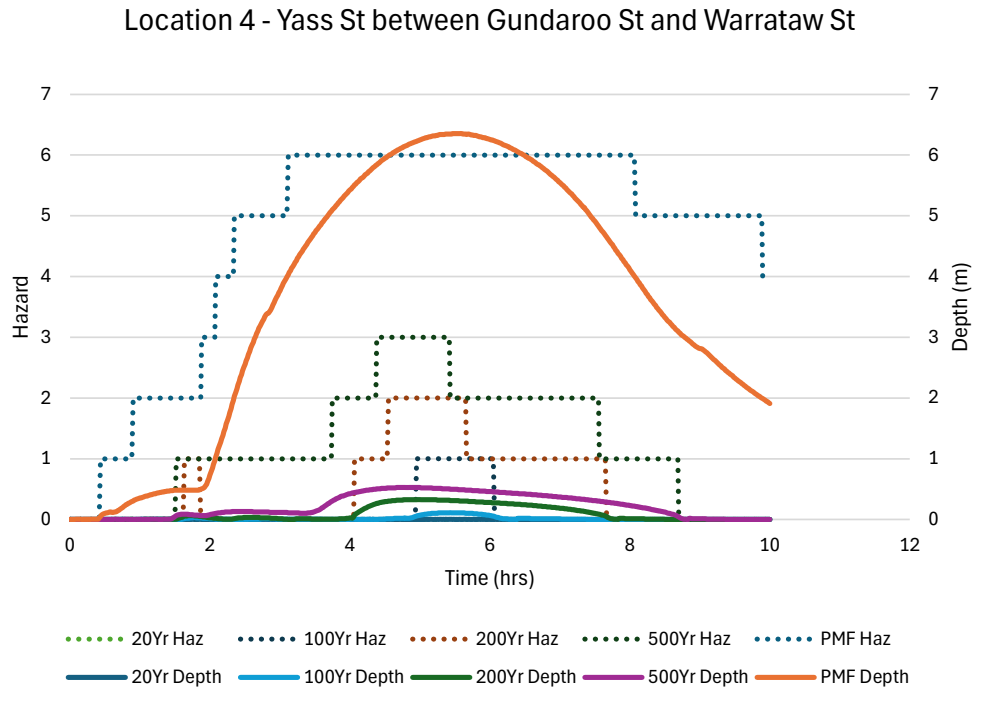


Plate 6 Hazard and depth hydrographs at Location 4

Interrogation of the hydrographs on **Plate 3** through **Plate 5** indicates that in all flood events up to and including the 500 year ARI, safe passage (either no inundation, or inundation with a hazard of no greater than H1) is available from the site and into the eastern portion (all areas to the east of Meadows Creek) of the township of Gunning (i.e.: via Locations 1 and 2). It also indicates that access south, through Gunning to the Hume Highway is also available from all proposed lots in events up to and including the 500 year ARI (i.e.: via Locations 1, 2 and 3). **Plate 6** indicates that access to the western side of Gunning (via Yass Street) would be cut in the 200 year ARI for 3.5 hours (3.5 hours after the onset of rainfall).

However, in the PMF, **Plate 3** through **Plate 6** indicate that access from the site to Gunning would not be possible for a maximum of 8 hours due to the inundation on Wombat Street (Locations 1 and 2). Access/egress at these locations would be cut 1 hour after the onset of rainfall (i.e., reflecting minimal advanced warning/evacuation opportunities).

It is noted that in the PMF, the majority of the southern and western portions of Gunning would be inundated by significant depths of water (>2 metres), and therefore, Gunning would not be a safe evacuation destination. It is more likely that the residents of Gunning would evacuate in the early stages of a flood to higher ground, such as the development site.

Overall, it is considered that the planning proposal can adhere to the requirements of the NSW SES and allows for safe occupation of future residents during all flood events. If evacuation is required, relocation to the eastern side of Gunning can be undertaken safely (by not traversing through any flood water, or flood water with a maximum of H1 hazard) from all lots in all flood events up to and including the 1 in 500 year ARI. Isolation of the site from Gunning is predicted in the PMF, however, the duration of isolation of 8 hours is considered tolerable given the extreme rarity of such an event and relatively short duration of isolation.

As an aside, it is considered appropriate that a site-specific Flood Emergency Response Plan (FERP) be prepared at DA stage to raise awareness of the potential impacts of flooding within the site, and suggested actions for residents before, during and after a flood event. As suggested by the NSW SES, this plan is not necessarily designed to manage the flood risk, but rather to raise awareness and should complement any flood awareness campaigns the NSW SES undertakes from time to time.

3 REGULATORY REQUIREMENTS

The rezoning of flood liable land requires that the future rezoning and any potential development resulting from it can comply with all local and state government legislation/requirements. These are detailed in the following sections.

3.1 Upper Lachlan Local Environment Plan 2010

The Upper Lachlan Local Environment Plan 2010 (LEP2010) outlines a number of requirements and matters that need consideration when deciding to grant development consent on flood liable land.

Section 5.21(2) and 5.21(3) of LEP2010 primarily deals with ways in which the proposed development will interact and impact on existing flood behaviour, and how the flood risk is managed. Details of how the future development of the site can meet each specific requirement of LEP2010 is summarised in **Table 1**.

Table 1 Upper Lachlan LEP2010 requirements and matters to be considered

Council Requirement	Does Development Meet this Requirement?
Section 5.21(2)	
a) The development is compatible with the flood function and behaviour on the land	The flood function (hydraulic categories) across the site for the 100 Year ARI and PMF have been defined (**Figures 13-14**). These figures show that the majority of the flow within the watercourse through the site is classified as 'floodway' areas. The location of the proposed RU5 and MU1 development lots (and therefore future dwellings) are located clear of floodways and flood storage areas. Any works on the C3 zoned lots will have a covenant placed on them prohibiting any buildings within the flood affected areas. Therefore, any development leading from the planning proposal would be compatible with the flood function in all flood events.
b) The development will not adversely affect flood behaviour in a way that results in detrimental increases in the potential flood affectation of other development or properties	No works are proposed in the vicinity of the watercourse through the site, and a stormwater management plan will be prepared to manage and treat runoff from development resulting from the planning proposal. Therefore, works resulting from the planning proposal are not predicted to impact flood behaviour or increase the flood affectation of other developments or properties.
c) The development will not adversely affect the safe occupation and efficient evacuation of people or exceed the capacity of existing evacuation routes for the surrounding area in the event of a flood	As discussed in Section 2.7, no inundation of the RU5 or MU1 portions of the site is predicted in any flood event and any works on the C3 zoned lots will have a covenant placed on them prohibiting any buildings within the flood affected areas. Therefore, all future dwelling will be elevated above all potential floods and evacuation from the site will not be necessary, facilitating safe occupation and ensuring the capacity of existing evacuation routes is not compromised.

Council Requirement	Does Development Meet this Requirement?
	However, if access/egress is required, evacuation will be possible in all flood events up to and including the 1 in 500 year ARI via: - Flood free access from the site into the eastern portion of the township of Gunning (all areas to the east of Meadows Creek). - Flood free access to the south of Gunning to the Hume Highway. In the PMF, access to Gunning is cut, however, the duration of isolation of 8 hours is considered tolerable given the extreme rarity of such an event and the relatively short duration of isolation. Overall, development resulting from the planning proposal is not predicted to adversely affect the safe occupation or efficient evacuation of people from the site.
d) The development incorporates appropriate measures to manage risk to life in the event of a flood	The development is considered to incorporate appropriate measures to manage the risk to life by locating all future dwellings above all potential floods. This also means that evacuation from the site will not be necessary in any flood event. However, safe access (no greater than H1 hazard) is available from all lots into Gunning (and south to the Hume Highway) in all events up to and including the 1 in 500 year ARI should access to/from the site be required. In the PMF, the duration of isolation of 8 hours is considered tolerable given the extreme rarity of such an event.
e) The development will not adversely affect the environment or cause avoidable erosion, siltation, destruction of riparian vegetation or a reduction in the stability of river banks or watercourses	No works are proposed in the vicinity of the watercourse through the site, and a stormwater management plan will be prepared to manage and treat any runoff from development resulting from the planning proposal. Therefore, the development is not predicted to adversely impact the environment or cause erosion, siltation, destruction of riparian vegetation or a reduction in the stability of riverbanks or watercourses in all flood events.
Section 5.21(3)	
a) The development needs to consider the impact of the development on projected changes to flood behaviour as a result of climate change	An assessment of the impact on 100 Year ARI flood behaviour resulting from climate change has been completed (see **Section 2.4**) and concluded that flood behaviour does not significantly change due to rainfall increases of 11% and 27% Therefore, as no development is proposed within the current PMF extent, so impacts to existing flood behaviour are predicted under climate change conditions.
b) The development needs to consider the intended design and scale of buildings resulting from the development	The design and scale of development (dwellings) within the future subdivision is yet to be completed. However, it is expected that it will be sympathetic to and appropriate for the surrounding natural and built environment, be acceptable to the community and maintain economic feasibility. It also aims to facilitate the development of the

Council Requirement	Does Development Meet this Requirement?
	subject site in a manner that is consistent with the desired future character of Gunning and in-line with other similar developments within the Upper Lachlan Shire.
c) The development needs to consider whether the development incorporates measures to minimise the risk to life and ensure the safe evacuation of people in the event of a flood	See response to 5.21(2) c) and d)
d) The development needs to consider the potential to modify, relocate or remove buildings resulting from development if the surrounding area is impacted by flooding or coastal erosion	Any dwellings resulting from this planning proposal are not predicted to be impacted in any flood event, including under climate change conditions and are not in a location at risk of coastal erosion. Therefore, modifying, relocating, or removing buildings from the site to reduce the flood risk is not considered necessary.

3.2 Upper Lachlan Development Control Plan 2010

Section 4.5.1 of the Upper Lachlan Development Control Plan 2010 (DCP2010) outlines the flood related controls that are applicable to works in areas that are subject to inundation during a 1 in 100-year ARI flood event. The controls, together with commentary on how the future development can satisfy the controls are included in **Table 2**.

Table 2 Flood related development controls from the Upper Lachlan Development Control Plan 2010

DCP 2010 Control	Comment
Works cannot involve any physical alteration to waterway or floodway including vegetation clearing	The existing watercourse will not be altered, with all existing vegetation retained. Revegetation is also proposed to enhance the biodiversity.
Works cannot involve net filling exceeding 50m^3, any reductions of on-site flood storage capacity is avoided and any changes to depth, duration, and velocity of floodwaters of all floods up to and including the 100-year ARI are contained within the site	No works (including filling) is proposed within the PMF extent, and therefore there will be no change to flood behaviour outside of the development site in any flood event (i.e.: no loss of flood storage, no changes to depths or flow paths outside of the site, no acceleration or retardation of flows, and no changes to warning times due to consistent flood behaviour outside of the site).
Works cannot involve any change in the flood characteristics of the 100-year ARI outside of the subject site that result in: - Loss of flood storage, or - Loss of/changes to flow paths, or - Acceleration or retardation of flows, or - Any reduction of warning times elsewhere on the floodplain	
All built form, infrastructure (unless designed to be inundated) and open space must be located on land that would not be	The proposed development layout will ensure that all dwellings are located on land that is located above the PMF level.

subject to flooding during the 100-year ARI flood event	
Where there is existing development located on land that is subject to inundation during the 100-year ARI flood event, this development /activity must not be intensified through further development	There is no existing development subject to inundation during the 100-year ARI flood event within the site. All areas where increased development is proposed are located clear of the 100 year ARI flood (and PMF) extent.

3.3 NSW Flood Prone Land Policy

The key objectives of the NSW Flood Prone Land Policy are detailed in the *'Flood Risk Management Manual'* (NSW Government, 2023). The Policy is intended to reduce the impacts of flooding and flood liability on communities and individual owners and occupiers of flood prone property and to reduce private and public losses resulting from floods.

The proposed development adheres to these objectives by allowing for all future development resulting from the planning proposal (including internal infrastructure, such as the access roadways) to be located outside of the floodplain. This ensures that the future community will not be impacted by flooding. Furthermore, the development is not predicted to increase the flood risk external to the site. As a result, the development will not result in increased private and public losses from flooding.

Therefore, it is considered that the proposal for rezoning of this land is in accordance with the objectives of the NSW Flood Prone Land Policy.

3.4 Considering Flooding in Land Use Planning Guideline (2021)

The '*Considering flooding in land use planning guideline'* (DPE, 2021) provides advice to Councils on flood-related land use planning and areas where flood-related development controls should apply. This guideline applies to the current assessment as it is a planning proposal. As such, it is important to ensure that the rezoning and development of the land is consistent with this guideline. The key objectives of the guideline and commentary on how the planning proposal intends to comply with these requirements are outlined in **Table 3**.

Table 3 Summary of the guidance provided in the '*Considering flooding in land use planning guideline'* (DPE, 2021).

Requirement	Comment
Considering the full range of flood events up to and including the PMF	The current assessment has examined flood behaviour for the 20 year, 100 year, 200 year and 500 year ARI events, as well as the PMF.
Considering the key constraints that result from flooding on land, namely: flood function, flood hazard, extent and flood behaviour and risk to life	The current assessment has defined the flood function (hydraulic categories), flood hazard, flood extent and behaviour for the full range of events up to the PMF. All proposed dwellings and infrastructure resulting from the planning

	proposal will be situated clear of all design floods, ensuring the flood risk is suitably mitigated and the existing flood function through and downstream of the site will be retained.
Definition of the Flood Planning Area (FPA) based on a Defined Flood Event (DFE)	As discussed in Section 2.6, the FPA has been adopted based on the definition provided within *'The Villages of Crookwell, Gunning, Collector and Taralga Floodplain Risk Management Study and Draft Plan'* (Lyall & Associates, 2017) which used the 100 Year ARI event as the DFE.
Adherence to the flood planning clause in the standard instrument (LEP2010)	As per **Section 3.1**, the planning proposal adheres to the requirement of Clause 5.21 of LEP2010

3.5 Specific Guidance

A review by the NSW Government's Biodiversity, Conservation and Science, Regional Delivery (BCS) department of the original planning proposal outlined a number of specific items that were required to be addressed. These items are summarised in **Table 4**. **Table 4** also includes commentary on how these requirements have been addressed as part of the current assessment.

Table 4 Summary of the specific guidance provided from the BCS department of the NSW government.

Requirement	Comment
A flooding investigation is required to demonstrate consistency with Section 9.1(2) Direction 4.1 of the Local Planning Direction.	The current FIRA has investigated the flood behaviour on the land and demonstrated consistency with Section 9.1(2) Direction 4.1 of the Local Planning Direction (see Chapter 4 of the current report).
The proposal should address the issues associated with the proposed rezoning of riparian lands and lands within the Flood Planning Area.	The planning proposal does seek to rezone the riparian corridor to C3 (environmental management). However, the existing watercourse and riparian vegetation will not be altered, and additional vegetation is to be provided to increase biodiversity.
The proposal seeks to rezone land that is flood prone and therefore will need to demonstrate consistency with Section 9.1(2) Direction 4.1 of the Local Planning Direction, the NSW Government's Flood Prone Land Policy and the Flood Risk Management Manual, 2023. The planning proposal should be supported by a Flood Impact and Risk Assessment (FIRA) to address the requirements of the local planning direction over the range of floods up to the Probable Maximum	The portion of the site to be rezoned as RU5 falls outside of the PMF extent and is therefore not flood prone. Any development on the C3 land will have a covenant placed on them prohibiting any buildings within the flood affected areas. Notwithstanding, consistency with Section 9.1(2) Direction 4.1 of the Local Planning Direction (see Section 4 of the current report) has been demonstrated. Additionally, Section 3.3 of the current report has demonstrated consistency with the Flood Prone Land Policy, and the Flood Risk Management Manual, 2023.

Flood (PMF) and issues relating to flood risk, impacts and public safety.	This report serves as the FIRA and includes assessment of the 20 year, 100 year, 200 year and 500 year ARI events, as well as the PMF and addressed issues related to flood risk, impacts and public safety (see Chapter 2 of the current report).

The NSW State Emergency Service (SES) SES also completes a review of the original planning proposal and provided comments or outlined items that were to be addressed. These comments and items are summarised in **Table 5**. **Table 5** also includes responses to the comments, or provides further details on how the identified requirements are to be met.

Table 5 Summary of the specific guidance provided from the NSW SES.

Requirement	Comment
Evacuation for occupants on lots 1-3 would be viable in all flood events via Cullerin Rd to the west. However, occupants would be unable to access Gunning in at least the 100 year ARI event due to flooding on Cullerin Rd to the west.	Although the SES comment identifies lots as becoming isolated from Gunning in at least the 100 year ARI event, the flood depth/hazard hydrographs presented on **Plate 3** through **Plate 5** demonstrate that in all flood events up to and including the 500 year ARI, safe passage (a hazard of no greater than H1 which is considered as 'passable') is available from the site and into the eastern portion of the township of Gunning (all areas to the east of Meadows Creek). It also indicates that access south, through the eastern portion of Gunning to the Hume Highway is also available from all proposed lots in events up to and including the 500 year ARI. Therefore, it is considered that the residents would not be isolated in events up to the 1 in 500 year ARI. In the PMF, **Plate 3** through **Plate 5** indicates that access to/from Gunning would not be possible for a maximum of 8 hours due to the inundation on Wombat Street. Access/egress at these locations would be cut 1 hour after the onset of rainfall providing limited opportunity for advanced evacuation. Overall, it is considered that the lots resulting from the planning proposal can adhere to the requirements of the NSW SES of requiring access/egress during floods up to and including a 1 in 500 year event.
The remainder of the lots appear to be flood free in all events. However, due to offsite flooding of Cullerin road to the west, these lots also become isolated from Gunning in at least the 100 year ARI event. The lots are isolated from all vehicular access/egress in the PMF event due to high hazard flooding of Biala Street. Therefore, the proposal will increase the number of people exposed to the effects of flooding and the risk of secondary emergencies such as fires and medical emergencies. We therefore recommend seeking further information regarding the frequency, duration and timing of isolation to better understand the risk to the proposed community. Following this, if appropriate we also recommend investigating access/egress routes to facilitate rising road access. Ideally the access/egress routes should provide rising road access and/or be passable up to at least a 1 in 500 year local flooding.	
Consideration should also be given to the impacts of localised flooding on evacuation routes. Evacuation must not	The watercourse passing through the site is a first order Strahler stream, and therefore represents a small tributary. The site that is the subject of the planning proposal is situated on high ground and

require people to drive or walk through flood water.	would exhibit 'sheet flow' runoff. Therefore, the flood behaviour represented within *'The Villages of Crookwell, Gunning, Collector and Taralga Floodplain Risk Management Study and Draft Plan'* (Lyall & Associates, 2017) is considered to be adequate to represent flooding in the vicinity of the site, and therefore appropriate to define the ability of evacuation from the site. Although evacuation from the site via completely flood free routes is not possible, the flood depth/hazard hydrographs presented on **Plate 3** through **Plate 5** demonstrate that in all flood events up to and including the 500 year ARI, safe passage (a hazard of no greater than H1) is available from the site and into the eastern portion of the township of Gunning (all areas to the east of Meadows Creek). It also indicates that access south, through the eastern portion of Gunning to the Hume Highway is also available from all proposed lots in events up to and including the 500 year ARI.

4 SECTION 9.1: LOCAL PLANNING DIRECTIONS DIRECTION 4.1: FLOODING

Section 9.1(2) of the Environmental Planning and Assessment Act permits the Minister for Planning to issue a direction in relation to the making of local environmental plans. Several of these have been issued including Direction 4.1 which relates to flooding. The direction is outlined below, and commentary has been provided on how the planning proposal intends to meet those requirements.

Objectives

The objectives of this direction are:

(a) ensure that development of flood prone land is consistent with the NSW Government's Flood Prone Land Policy and the principles of the Floodplain Development Manual 2005, and

Consistent: It is noted that the *Floodplain Development Manual 2005* has been superseded by the *Flood Risk Management Manual 2023*. Nevertheless, the underlying principles of both documents are consistent.
This FIRA was prepared based on flood models originally developed as part of *'The Villages of Crookwell, Gunning, Collector and Taralga Floodplain Risk Management Study and Draft Plan'* (Lyall & Associates, 2017), which was prepared using the principles of the NSW Government's Flood Prone Land Policy and Floodplain Development Manual 2005.
The assessment has shown that the planning proposal allows for development within the site that is compatible with the flood behaviour and function on the land by locating all developable portions of the land outside of the floodplain.
The proposal is also not predicted to adversely impact on peak flood level or velocity outside of the development site in any flood event due to no works being undertaken within the PMF extent. Therefore, the proposal is not predicted to increase any public or private losses from flooding.
Furthermore, the development of the site recognises the value of use, occupation and development of the land.
Each of these outcomes demonstrate that the development proposal meets the key objectives of the NSW Government's Flood Prone Land Policy and Floodplain Development Manual 2005.

(b) ensure that the provisions of an LEP that apply to flood prone land are commensurate with flood behaviour and includes consideration of the potential flood impacts both on and off the subject land.

Consistent: The proposed development arrangement is considered to provide suitable management of the flood behaviour and flood risk by locating developable areas outside of the floodplain. It is considered that there is no potential flood impact during any flood event as all future works will be located outside of the PMF extent.

Application

This direction applies to all relevant planning authorities that are responsible for flood prone land when preparing a planning proposal that creates, removes or alters a zone or a provision that affects flood prone land.

Applies: The planning proposal is located within the Upper Lachlan Shire Council LGA. Upper Lachlan Shire Council are responsible for the management of flood prone land within the Upper Lachlan Shire Council LGA. The planning proposal aims to rezone land that is flood prone.

Direction 4.1

(1) A planning proposal must include provisions that give effect to and are consistent with:

(a) the NSW Flood Prone Land Policy

Consistent: A discussion on how this proposal has demonstrated compliance with the NSW Flood Prone Land Policy is included in Section 3.3 as well as the previous page of this report.

(b) the principles of the Floodplain Development Manual 2005

Consistent: As outlined in Section 3.3, the proposal has demonstrated compliance with the NSW Flood Prone Land Policy and has maintained the hydrologic and hydraulic parameters, hydraulic category definitions and flood planning area definitions from *'The Villages of Crookwell, Gunning, Collector and Taralga Floodplain Risk Management Study and Draft Plan'* (Lyall & Associates, 2017) which was prepared in accordance with the NSW Floodplain Development Manual 2005 and is considered to be the best local guidance.

(c) The Considering flooding in land use planning guideline 2021, and

Consistent: A discussion on how this proposal has demonstrated compliance with the 'Considering Flooding in Land Use Planning Guideline' 2021 is included in Section 3.4 of this report.

(d) any adopted flood study and/or floodplain risk management plan prepared in accordance with the principles of the Floodplain Development Manual 2005 and adopted by the relevant council.

Consistent: This FIRA has maintained the hydrologic and hydraulic parameters, hydraulic category definitions and flood planning area definitions from *'The Villages of Crookwell, Gunning, Collector and Taralga Floodplain Risk Management Study and Draft Plan'* (Lyall & Associates, 2017) which was prepared in accordance with the NSW Floodplain Development Manual 2005.

(2) A planning proposal must not rezone land within the flood planning area from Recreation, Rural, Special Purpose or Conservation Zones to a Residential, Employment, Mixed Use, W4 Working Waterfront or Special Purpose Zones.

Consistent. The rezoning is as such that the watercourse, as well as all land impacted by the PMF (which also fully encompasses the flood planning area) will be zoned as C3 (environmental management) which is not an exclusionary zoning as per this direction.

(3) A planning proposal must not contain provisions that apply to the flood planning area which:

(a) permit development in floodway areas,

Consistent: No development is proposed within the flood planning area, confirming that no habitable development is proposed within any floodway area.

(b) permit development that will result in significant flood impacts to other properties,

Consistent: No works resulting from the planning proposal will be located within the PMF extent, and therefore, the works will not produce any impacts on flood behaviour across other properties. However, a stormwater management plan will be required to manage and treat runoff from development resulting from the planning proposal.

(c) permit development for the purposes of residential accommodation in high hazard areas,

Consistent: No residential development is proposed within any high hazard areas during floods up to and including the PMF.

(d) permit a significant increase in the development and/or dwelling density of that land,

Consistent: The rezoning from RU4 to RU5 provides the opportunity for increased development within the overall site, however, this falls outside of the PMF extent. However, the location of the watercourse, as well as and affected by the PMF are to be zoned C3 (environmental management) reflecting a reduced potential for development density. A covenant will also be placed on these areas to ensure that no development or increase in dwelling density occurs within the flood planning area

(e) permit development for the purpose of centre-based childcare facilities, hostels, boarding houses, group homes, hospitals, residential care facilities, respite day care centres and seniors housing in areas where the occupants of the development cannot effectively evacuate,

Consistent: These types of sensitive land uses are not proposed as part of the rezoning. However, it is acknowledged that child care centres are permissible with consent. However, no habitable areas will be contained within the PMF extent and evacuation

to the eastern parts of Gunning or the Hume Highway will be possible during all floods up to and including the 1 in 500 year event.

(f) permit development to be carried out without development consent except for the purposes of exempt development or agriculture. Dams, drainage canals, levees, still require development consent,

Consistent: No development within the flood planning area is proposed. Notwithstanding, it is understood that a development application will be lodged seeking consent for the proposed development following the approval of the planning proposal.

(g) are likely to result in a significantly increased requirement for government spending on emergency management services, flood mitigation and emergency response measures, which can include but are not limited to the provision of road infrastructure, flood mitigation infrastructure and utilities, or

Consistent: The proposed rezoning will locate all development outside of the PMF extent. This will avoid the need for increased government spending on flood mitigation.
Evacuation from the site is not considered necessary, however, can be safely completed to the eastern portion of Gunning as well to the Hume Highway in all events up to and including the 1 in 500 year ARI. Therefore, the proposal will not require increased spending on emergency management services and emergency response measures.

(h) permit hazardous industries or hazardous storage establishments where hazardous materials cannot be effectively contained during the occurrence of a flood event.

Consistent: No works resulting from the planning proposal will be located within the PMF, and therefore no hazardous industries or hazardous storage establishments would fall within the flood planning area.

(4) A planning proposal must not contain provisions that apply to areas between the flood planning area and probable maximum flood to which Special Flood Considerations apply which:

(a) permit development in floodway areas,
(b) permit development that will result in significant flood impacts to other properties,
(c) permit a significant increase in the dwelling density of that land,
(d) permit the development of centre-based childcare facilities, hostels, boarding houses, group homes, hospitals, residential care facilities, respite day care centres and seniors housing in areas where the occupants of the development cannot effectively evacuate,
(e) are likely to affect the safe occupation of and efficient evacuation of the lot, or
(f) are likely to result in a significantly increased requirement for government spending on emergency management services, and flood mitigation and emergency response measures, which can include but not limited to road infrastructure, flood mitigation infrastructure and utilities.

Consistent: Upper Lachlan Shire Council has adopted the Special Flood Considerations clause (clause 5.22 within the LEP). However, no development within the PMF is proposed and no sensitive land uses are proposed and, therefore, the special flood considerations clause would not apply.

(5) For the purposes of preparing a planning proposal, the flood planning area must be consistent with the principles of the Floodplain Development Manual 2005 or as otherwise determined by a Floodplain Risk Management Study or Plan adopted by the relevant council.

Consistent: The flood planning area definition contained in *'The Villages of Crookwell, Gunning, Collector and Taralga Floodplain Risk Management Study and Draft Plan'* (Lyall & Associates, 2017), which was prepared in accordance with the NSW Floodplain Development Manual 2005 and has been adopted by Upper Lachlan Shire.

Consistency

(9) A planning proposal may be inconsistent with this direction only if the planning proposal authority can satisfy the Planning Secretary (or their nominee) that:

(a) the planning proposal is in accordance with a floodplain risk management study or plan adopted by the relevant council in accordance with the principles and guidelines of the Floodplain Development Manual 2005, or

Not applicable: The planning proposal is consistent with this direction.

(b) where there is no council adopted floodplain risk management study or plan, the planning proposal is consistent with the flood study adopted by the council prepared in accordance with the principles of the Floodplain Development Manual 2005 or

Not applicable: The planning proposal is consistent with this direction.

(c) the planning proposal is supported by a flood impact and risk assessment accepted by the relevant planning authority and is prepared in accordance with the principles of the Floodplain Development Manual 2005 and consistent with the relevant planning authorities' requirements, or

Not applicable: The planning proposal is consistent with this direction.

(d) the provisions of the planning proposal that are inconsistent are of minor significance as determined by the relevant planning authority.

Not applicable: The planning proposal is consistent with this direction.

5 SUMMARY

Upper Lachlan Shire Council, on behalf of Stuart and Catherine Duke, is proposing to amend the Upper Lachlan Local Environment Plan (LEP) 2010 to rezone land located at Lot 4 DP 1198749 from RU4 (Primary Production Small Lots) zone to RU5 (Village) zone, MU1 (Mixed Use) zone and C3 (Environmental Management). This report serves as a flood impact and risk assessment that was completed to address the potential flood impacts of the proposed rezoning and development of the site.

The assessment was completed using a RORB hydrologic model to simulate catchment hydrology and a TUFLOW model to simulate flood hydraulics. Both models were developed as part of '*The Village of Gunning Flood Study*' (Lyall & Associates, 2014), and subsequently used as part of *'The Villages of Crookwell, Gunning, Collector and Taralga Floodplain Risk Management Study and Draft Plan'* (Lyall & Associates, 2017). However, the models were refined as part of the current assessment to provide an improved understanding of the flood risk through the site.

The models were used to simulate a range of design floods including the 20 year, 100 year, 200 year and 500 year ARI events, as well as the PMF for 'existing' conditions. The outcomes of the existing conditions assessment showed that there would be no interaction of floodwater in any event with the development that will result from the planning proposal, with all flood prone land contained within the proposed C3 zoning. Local runoff generated within the site will be managed by a stormwater management plan that will be prepared as part of the development application stage.

An assessment of climate change impacts was also completed (using the 200 year ARI and 500 year ARI events as proxies for increased rainfall intensity during the 100 year ARI flood). This assessment showed that future increases in rainfall are not predicted to have a significant impact on present day design flood behaviour.

The flood planning area has been mapped based on the definition of mainstream flooding from *'The Villages of Crookwell, Gunning, Collector and Taralga Floodplain Risk Management Study and Draft Plan'* (Lyall & Associates, 2017) and confirms that all development that would result from the planning proposal would be located outside of the flood planning area.

Emergency response has been considered and although evacuation from the site is not considered necessary (i.e., all proposed dwellings can be located above the peak level of the PMF), safe access (no greater than H1 hazard) is available from all lots into Gunning (and south to the Hume Highway) in all events up to and including the 1 in 500 year ARI. In the PMF, the duration of isolation of 8 hours is considered tolerable given the extreme rarity of such an event and relatively short duration of isolation.

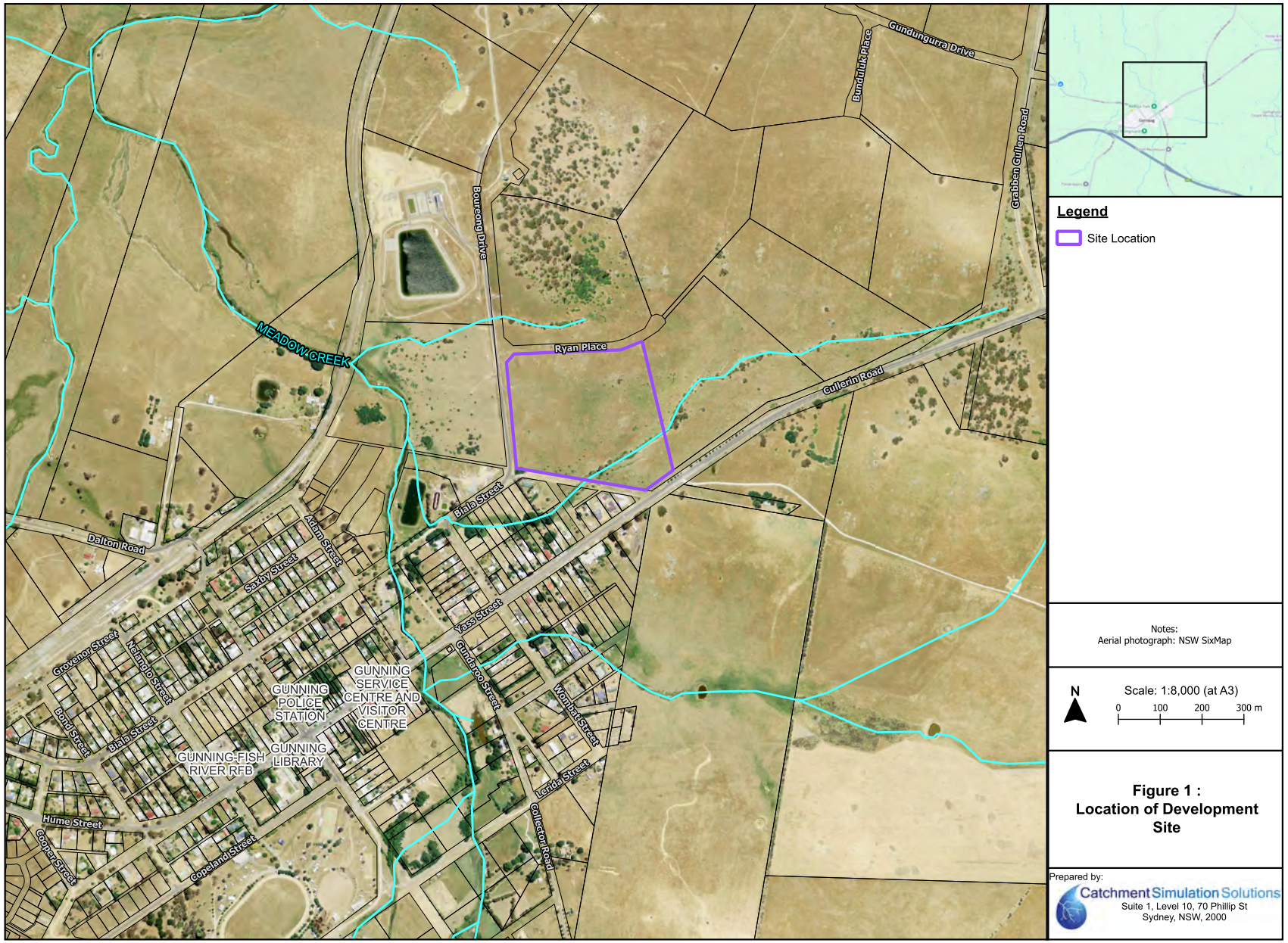
Overall, the rezoning and development of the land is considered to adhere to the principles of the Floodplain Development Manual 2005, NSW Government's Flood Prone Land Policy, and Considering Flooding in Land Use Planning Guideline 2021. It also demonstrates

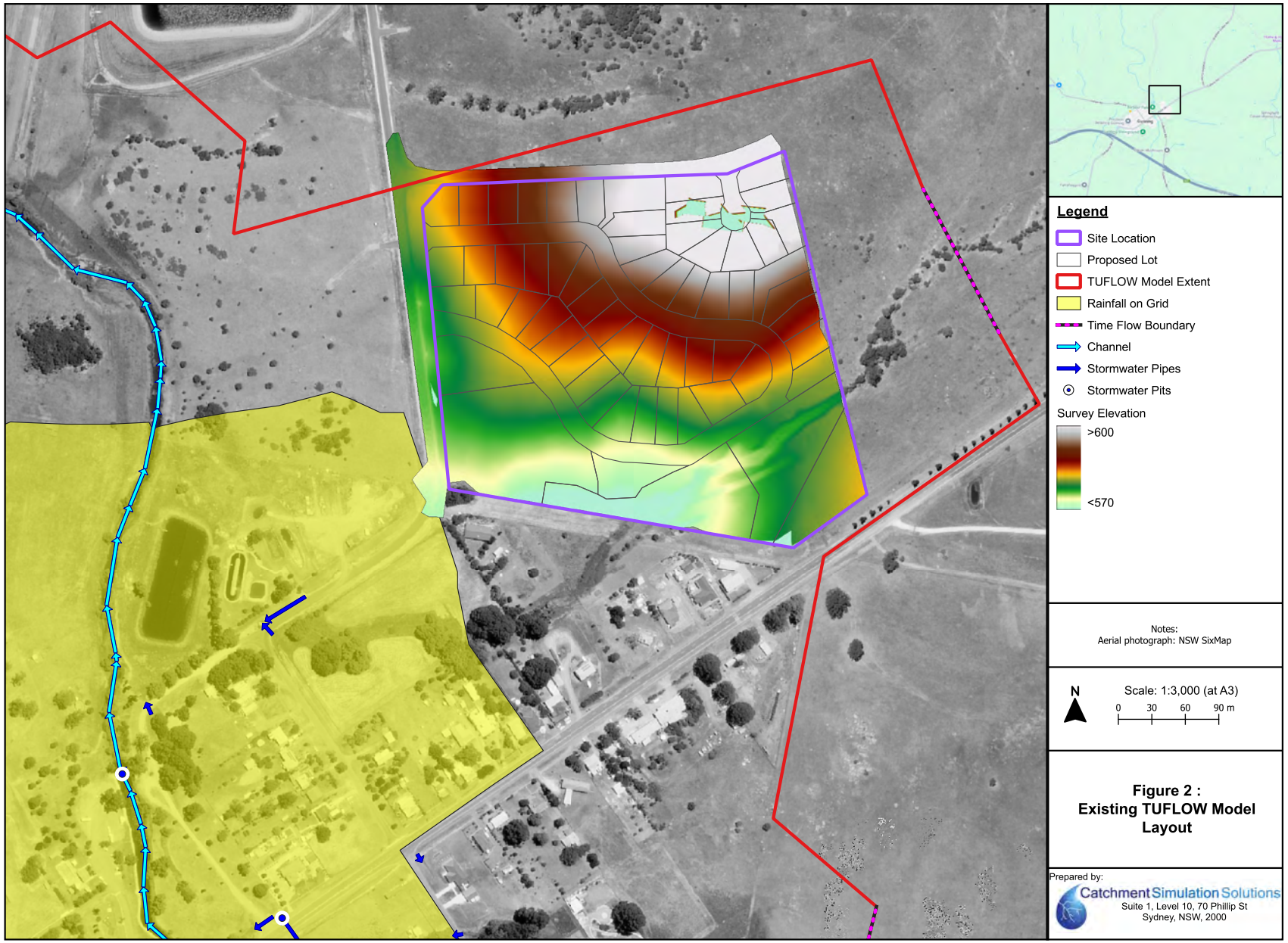
compliance with the Upper Lachlan Shire Local Environment Plan 2010 and Upper Lachlan Shire Development Control Plan 2010. All specific guidance provided by the NSW Government's Biodiversity, Conservation and Science, Regional Delivery (BCS) department and the NSW SES has also been addressed, which includes Ministerial Direction 4.1.

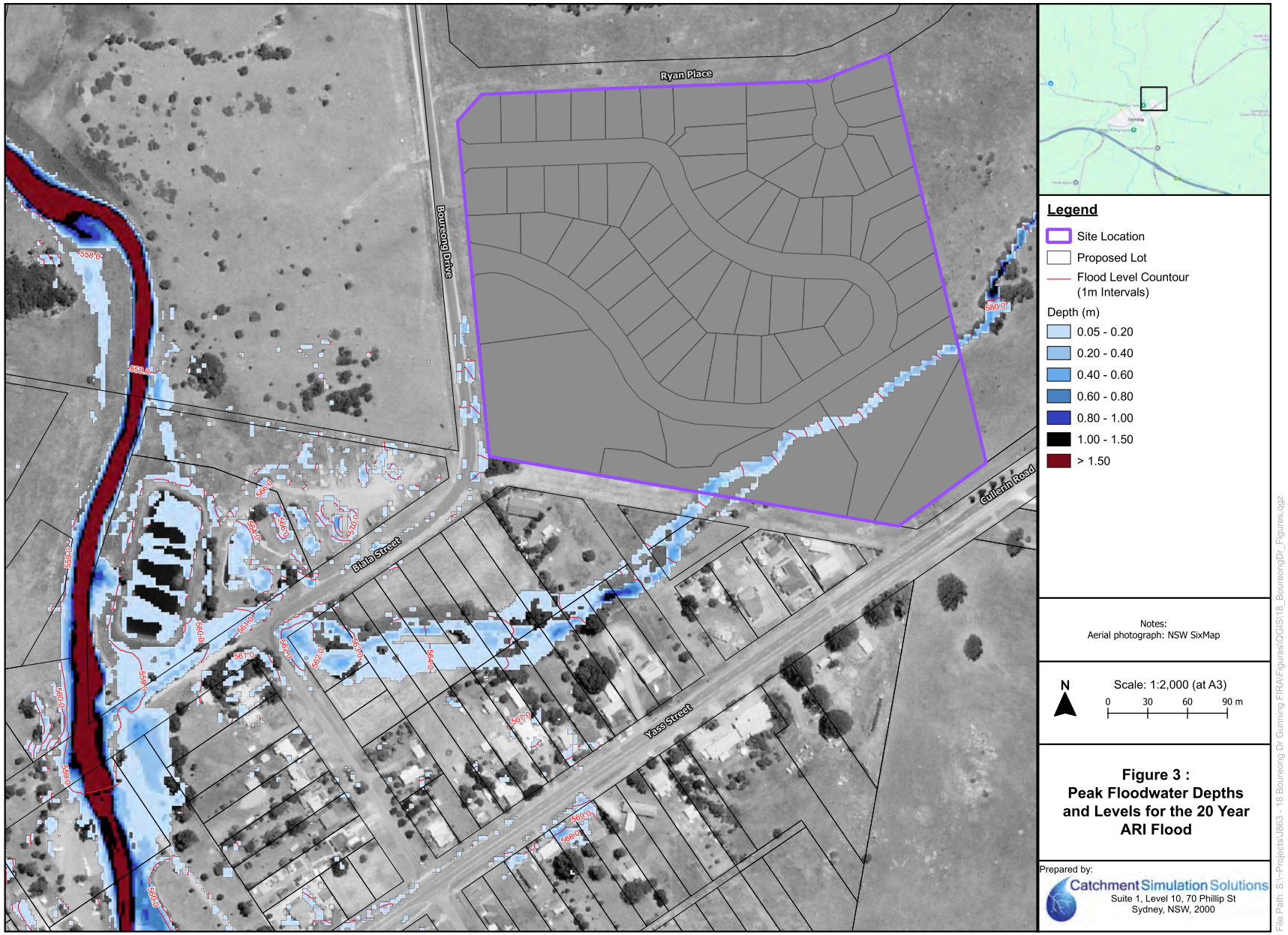
6 REFERENCES

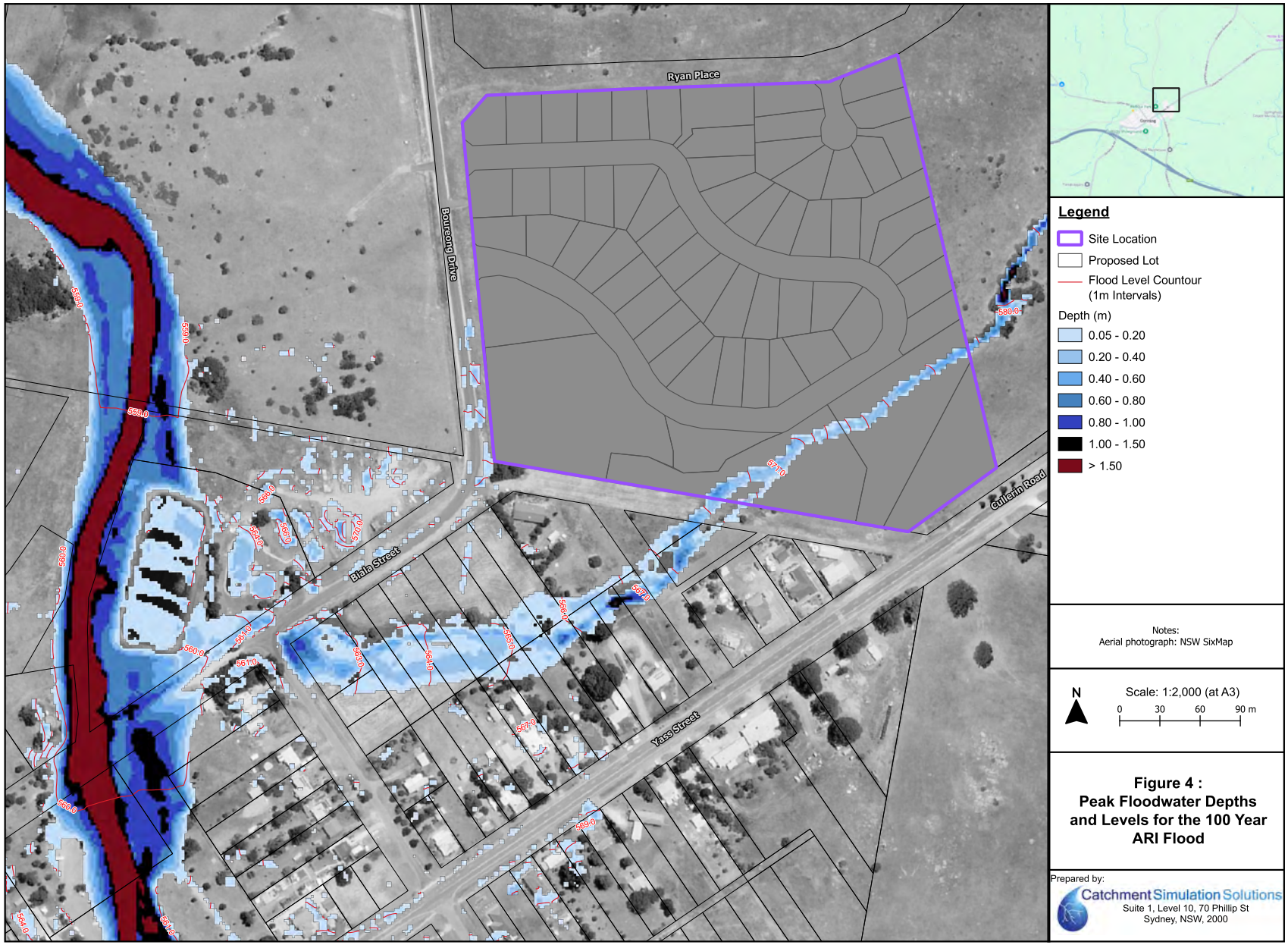
- Department of Planning and Environment (2021) *Considering flooding in land use planning guideline*
- Engineers Australia (2015). *Australian Rainfall and Runoff – Project 11: Blockage Guidelines for Culverts and Small Bridges*
- Lyall & Associates (2014). *The Village of Gunning Flood Study*. Prepared for Upper Lachlan Shire Council
- Lyall & Associates (2017). *The Villages of Crookwell, Gunning, Collector and Taralga Floodplain Risk Management Study and Draft Plan*. Prepared for Upper Lachlan Shire Council
- NSW Government. (2023). *Flood Risk Management Guideline FB02 - Flood Function*
- NSW Government. (2023). *Flood Risk Management Guideline FB03 – Flood Hazard*
- NSW Government. (2023). *Flood Risk Management Manual*
- Upper Lachlan Shire (2010) *Upper Lachlan Shire Development Control Plan*
- Upper Lachlan Shire (2010) *Upper Lachlan Local Environment Plan*

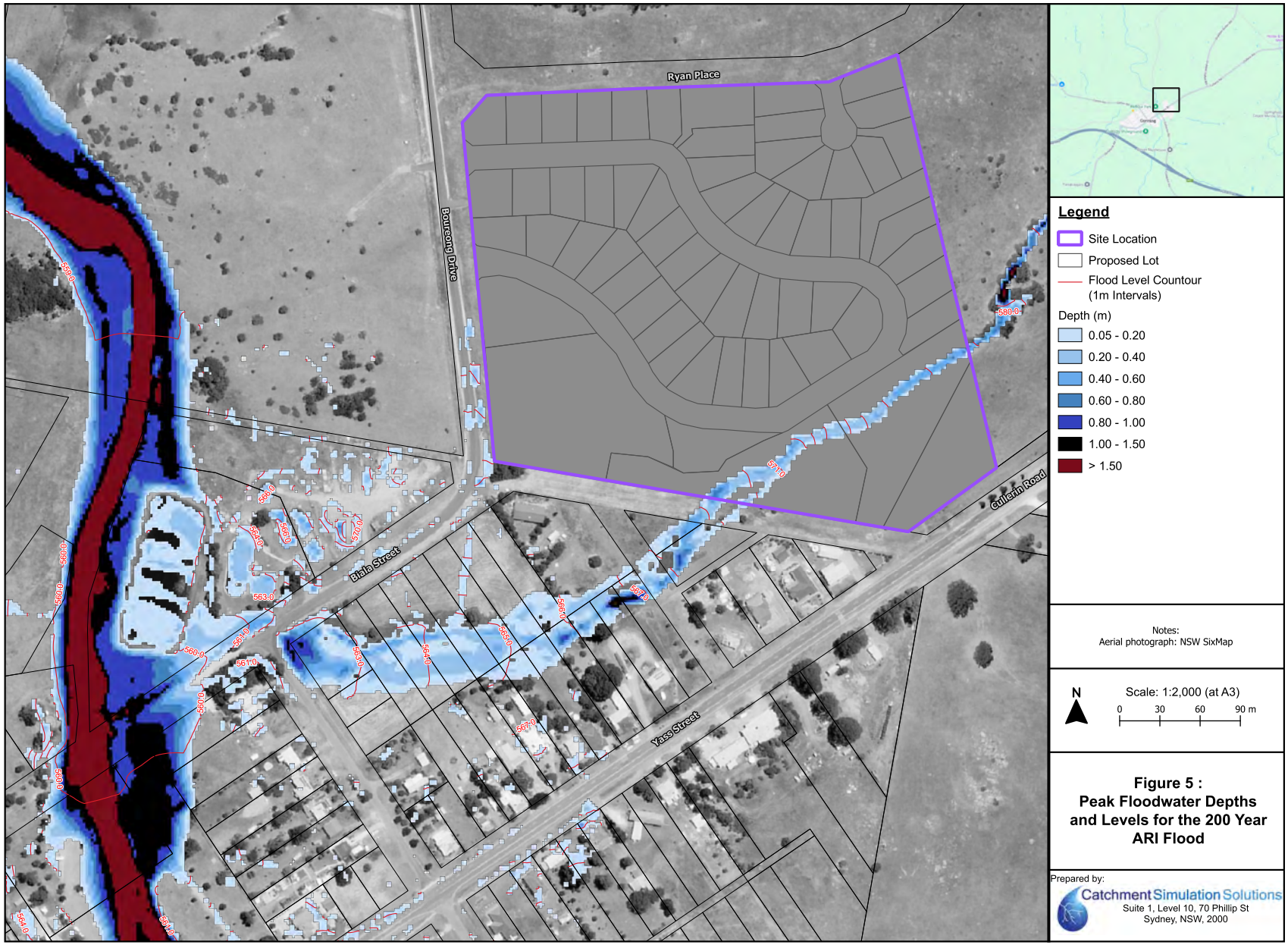
APPENDIX A
FIGURES


MEADOW CREEK
Ryan Place
Boureong Drive
Gundingurra Drive
Bundilark Place
Grabben Gullen Road
Cullerin Road
Binda Street
Dalton Road
Adam Street
Sandy Street
Yass Street
Grosvenor Street
Nanandia Street
Bond Street
Binda Street
GUNNING POLICE STATION
GUNNING SERVICE CENTRE AND VISITOR CENTRE
GUNNING LIBRARY
GUNNING-FISH RIVER RFB
Gundaroo Street
Wombat Street
Lerida Street
Collector Road
Hume Street
Cooper Street
Copeland Street
Legend
Site Location
Notes:
Aerial photograph: NSW SixMap
N
Scale: 1:8,000 (at A3)
0 100 200 300 m
Figure 1 :
Location of Development Site
Prepared by:
Catchment Simulation Solutions
Suite 1, Level 10, 70 Phillip St
Sydney, NSW, 2000
File Path: S:\~Projects\J863 - 18 Boureong Dr Gunning FIRA\Figures\QGIS\18_BoureongDr_Figures.qgz


Legend
Site Location
Proposed Lot
TUFLOW Model Extent
Rainfall on Grid
Time Flow Boundary
Channel
Stormwater Pipes
Stormwater Pits
Survey Elevation
>600
<570
Notes:
Aerial photograph: NSW SixMap
N
Scale: 1:3,000 (at A3)
0 30 60 90 m
Figure 2 :
Existing TUFLOW Model
Layout
Prepared by:
Catchment Simulation Solutions
Suite 1, Level 10, 70 Phillip St
Sydney, NSW, 2000
File Path: S:\~Projects\J863 - 18 Boureong Dr Gunning FIRA\Figures\QGIS\18_BoureongDr_Figures.qgz


Ryan Place
Boureong Drive
Biala Street
Yass Street
Cullerin Road
Legend
Site Location
Proposed Lot
Flood Level Countour
(1m Intervals)
Depth (m)
0.05 - 0.20
0.20 - 0.40
0.40 - 0.60
0.60 - 0.80
0.80 - 1.00
1.00 - 1.50
> 1.50
Notes:
Aerial photograph: NSW SixMap
N
Scale: 1:2,000 (at A3)
0 30 60 90 m
Figure 3 :
Peak Floodwater Depths
and Levels for the 20 Year
ARI Flood
Prepared by:
Catchment Simulation Solutions
Suite 1, Level 10, 70 Phillip St
Sydney, NSW, 2000
File Path: S:\~Projects\J863 - 18 Boureong Dr Gunning FIRA\Figures\QGIS\18_BoureongDr_Figures.qgz


Ryan Place
Boureong Drive
Biala Street
Yass Street
Cullerin Road
Legend
Site Location
Proposed Lot
Flood Level Countour
(1m Intervals)
Depth (m)
0.05 - 0.20
0.20 - 0.40
0.40 - 0.60
0.60 - 0.80
0.80 - 1.00
1.00 - 1.50
> 1.50
Notes:
Aerial photograph: NSW SixMap
N
Scale: 1:2,000 (at A3)
0 30 60 90 m
Figure 4 :
Peak Floodwater Depths
and Levels for the 100 Year
ARI Flood
Prepared by:
Catchment Simulation Solutions
Suite 1, Level 10, 70 Phillip St
Sydney, NSW, 2000
File Path: S:\~Projects\J863 - 18 Boureong Dr Gunning FIRA\Figures\QGIS\18_BoureongDr_Figures.qgz


Ryan Place
Boureong Drive
Biala Street
Yass Street
Cullerin Road
Legend
Site Location
Proposed Lot
Flood Level Countour
(1m Intervals)
Depth (m)
0.05 - 0.20
0.20 - 0.40
0.40 - 0.60
0.60 - 0.80
0.80 - 1.00
1.00 - 1.50
> 1.50
Notes:
Aerial photograph: NSW SixMap
N
Scale: 1:2,000 (at A3)
0 30 60 90 m
Figure 5 :
Peak Floodwater Depths
and Levels for the 200 Year
ARI Flood
Prepared by:
Catchment Simulation Solutions
Suite 1, Level 10, 70 Phillip St
Sydney, NSW, 2000
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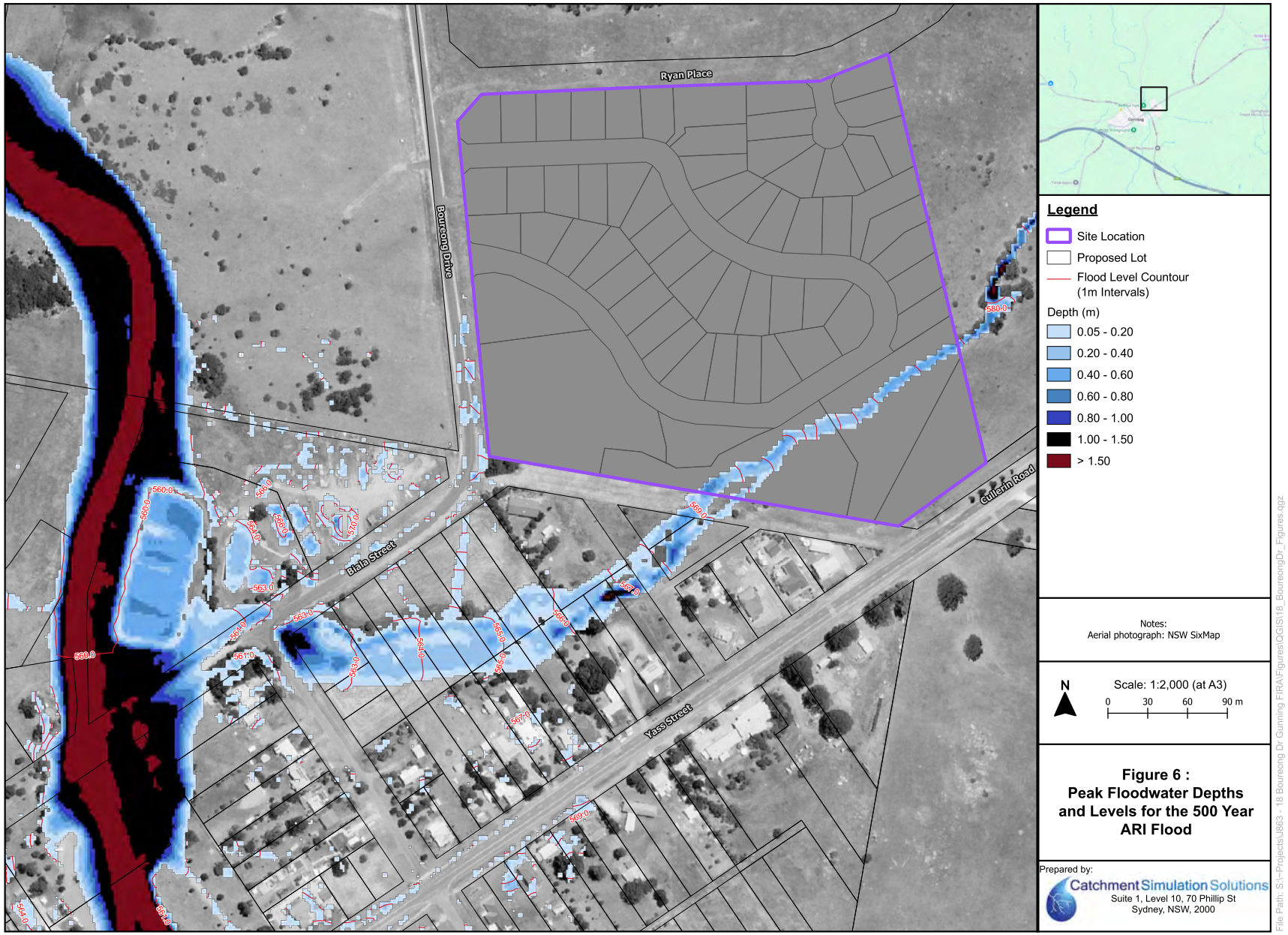
Ryan Place
Boureong Drive
Biala Street
Yass Street
Cullerin Road
Legend
Site Location
Proposed Lot
Flood Level Countour
(1m Intervals)
Depth (m)
0.05 - 0.20
0.20 - 0.40
0.40 - 0.60
0.60 - 0.80
0.80 - 1.00
1.00 - 1.50
> 1.50
Notes:
Aerial photograph: NSW SixMap
N
Scale: 1:2,000 (at A3)
0 30 60 90 m
Figure 6 :
Peak Floodwater Depths
and Levels for the 500 Year
ARI Flood
Prepared by:
Catchment Simulation Solutions
Suite 1, Level 10, 70 Phillip St
Sydney, NSW, 2000
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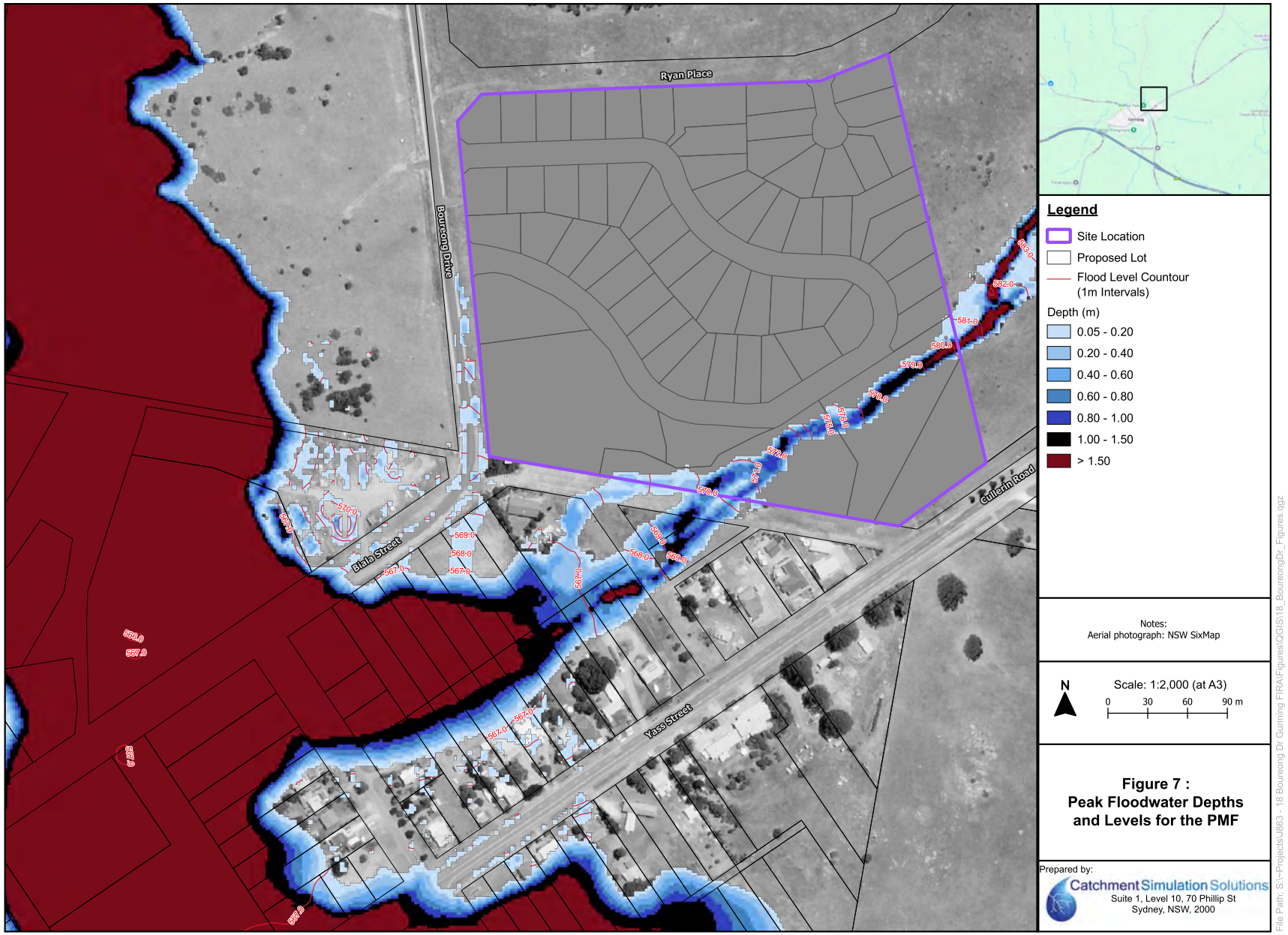
Ryan Place
Boureong Drive
Biala Street
Yass Street
Gullem Road
Legend
Site Location
Proposed Lot
Flood Level Countour
(1m Intervals)
Depth (m)
0.05 - 0.20
0.20 - 0.40
0.40 - 0.60
0.60 - 0.80
0.80 - 1.00
1.00 - 1.50
> 1.50
Notes:
Aerial photograph: NSW SixMap
N
Scale: 1:2,000 (at A3)
0 30 60 90 m
Figure 7 :
Peak Floodwater Depths
and Levels for the PMF
Prepared by:
Catchment Simulation Solutions
Suite 1, Level 10, 70 Phillip St
Sydney, NSW, 2000
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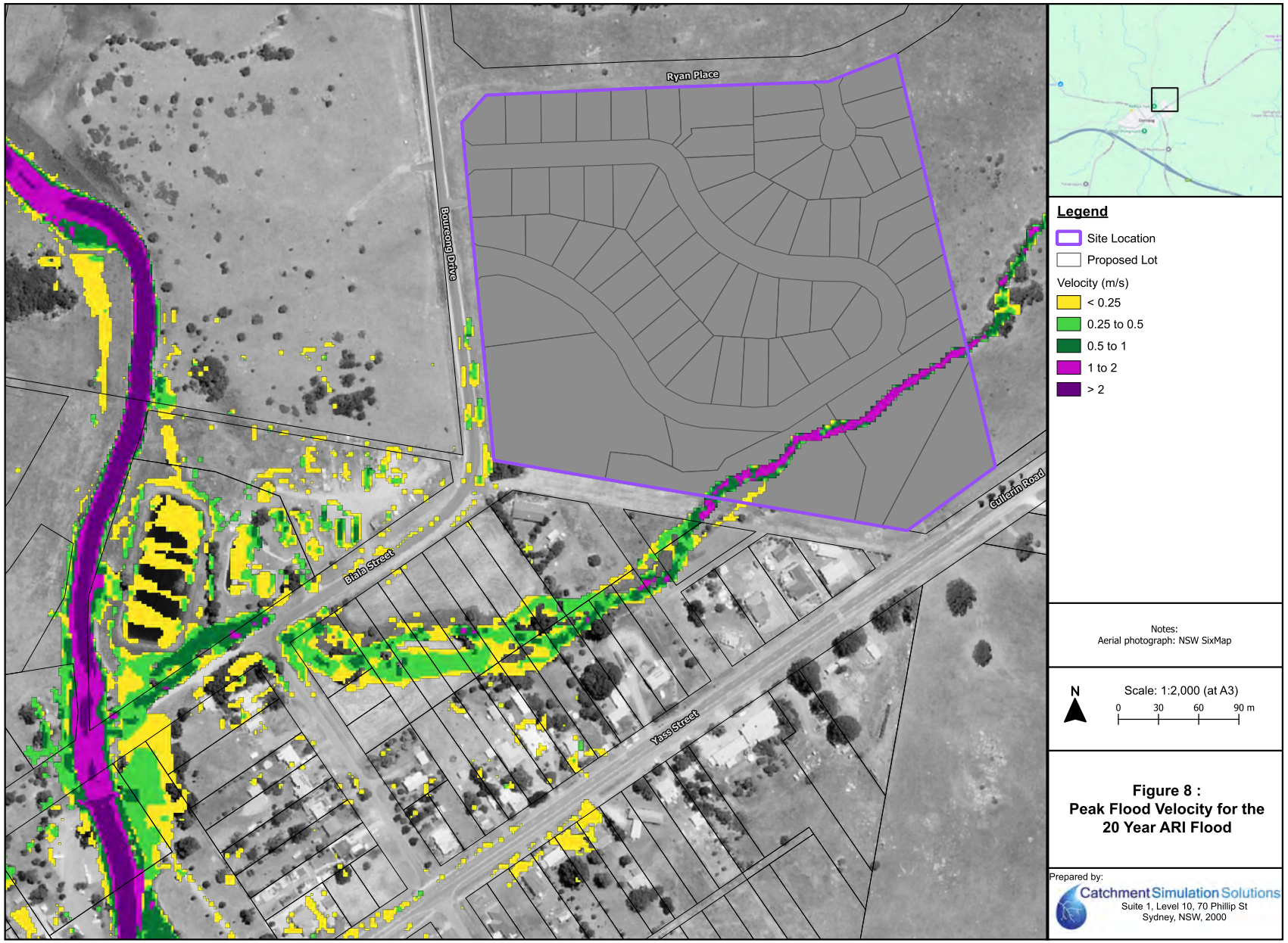
Ryan Place
Boureong Drive
Biala Street
Cullerin Road
Yass Street
Legend
Site Location
Proposed Lot
Velocity (m/s)
< 0.25
0.25 to 0.5
0.5 to 1
1 to 2
> 2
Notes:
Aerial photograph: NSW SixMap
N
Scale: 1:2,000 (at A3)
0 30 60 90 m
Figure 8 :
Peak Flood Velocity for the
20 Year ARI Flood
Prepared by:
Catchment Simulation Solutions
Suite 1, Level 10, 70 Phillip St
Sydney, NSW, 2000
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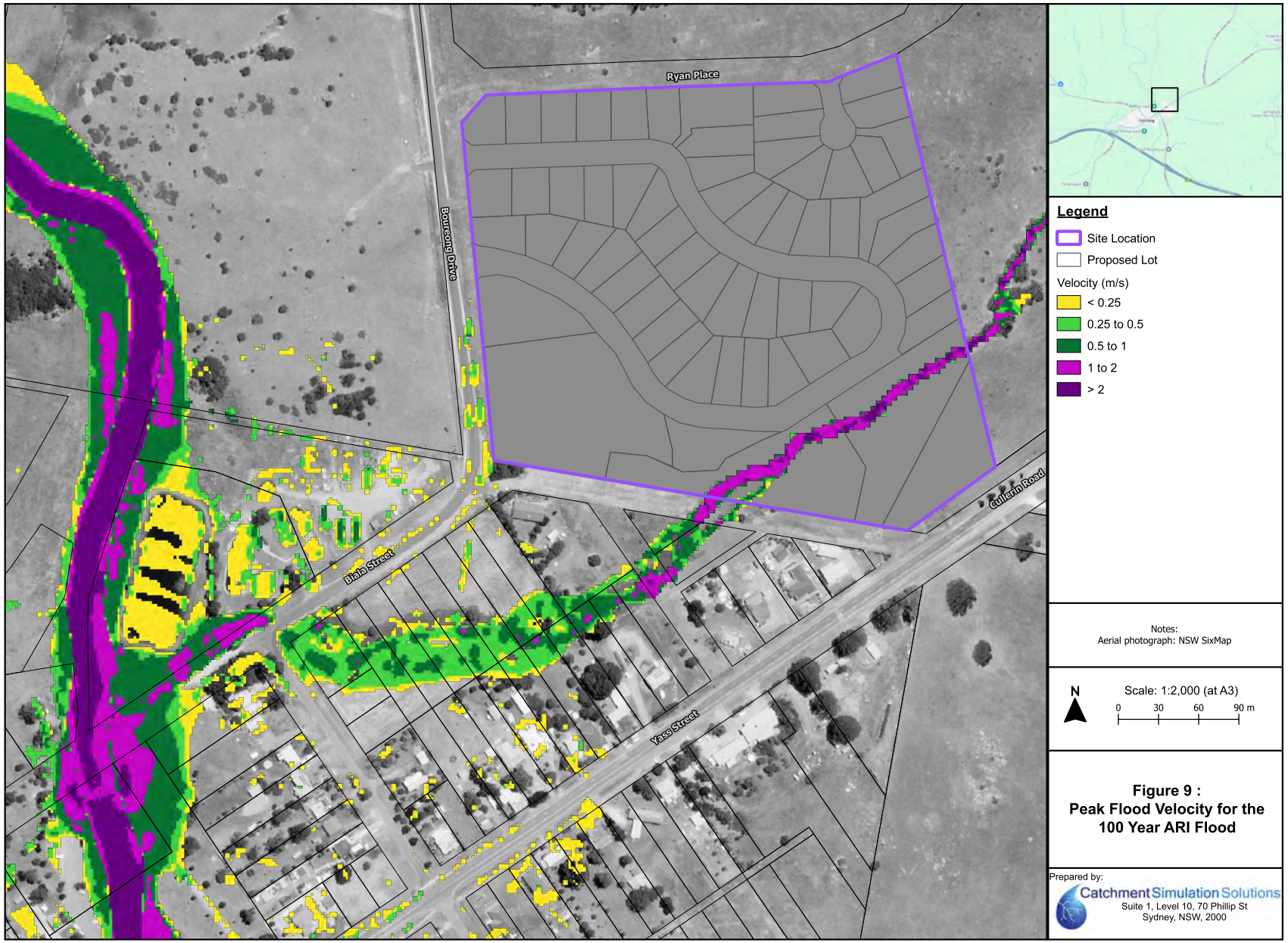
Ryan Place
Boureong Drive
Birla Street
Cullerin Road
Yass Street
Legend
Site Location
Proposed Lot
Velocity (m/s)
< 0.25
0.25 to 0.5
0.5 to 1
1 to 2
> 2
Notes:
Aerial photograph: NSW SixMap
N
Scale: 1:2,000 (at A3)
0 30 60 90 m
Figure 9 :
Peak Flood Velocity for the
100 Year ARI Flood
Prepared by:
Catchment Simulation Solutions
Suite 1, Level 10, 70 Phillip St
Sydney, NSW, 2000
File Path: S:\~Projects\J863 - 18 Boureong Dr Gunning FIRA\Figures\QGIS\18_BoureongDr_Figures.qgz


Ryan Place
Boureong Drive
Biala Street
Cullerin Road
Yass Street
Legend
Site Location
Proposed Lot
Velocity (m/s)
< 0.25
0.25 to 0.5
0.5 to 1
1 to 2
> 2
Notes:
Aerial photograph: NSW SixMap
N
Scale: 1:2,000 (at A3)
0 30 60 90 m
Figure 10 :
Peak Flood Velocity for the
200 Year ARI Flood
Prepared by:
Catchment Simulation Solutions
Suite 1, Level 10, 70 Phillip St
Sydney, NSW, 2000
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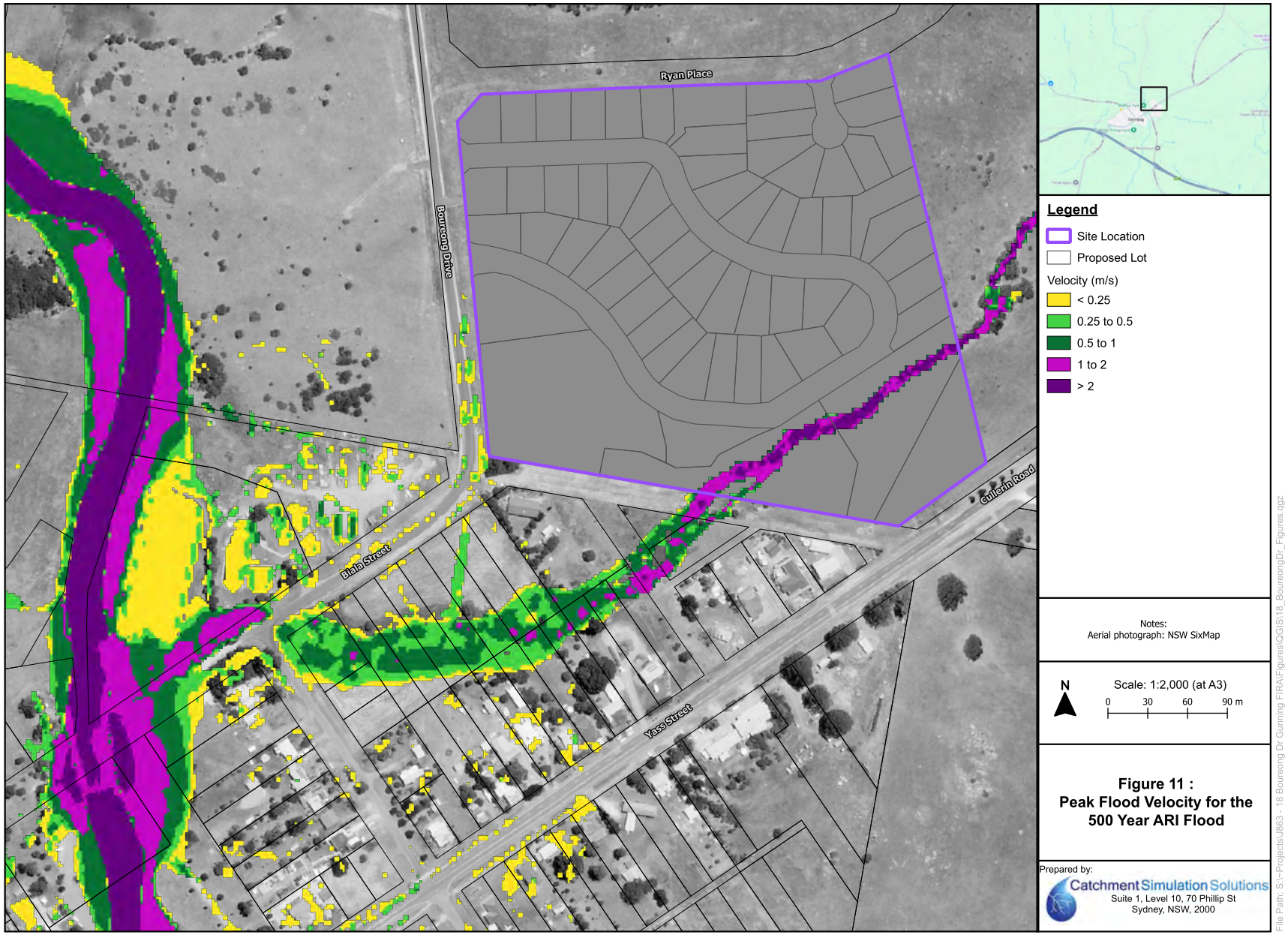
Ryan Place
Boureong Drive
Biala Street
Cullerin Road
Yass Street
Legend
Site Location
Proposed Lot
Velocity (m/s)
< 0.25
0.25 to 0.5
0.5 to 1
1 to 2
> 2
Notes:
Aerial photograph: NSW SixMap
N
Scale: 1:2,000 (at A3)
0 30 60 90 m
Figure 11 :
Peak Flood Velocity for the
500 Year ARI Flood
Prepared by:
Catchment Simulation Solutions
Suite 1, Level 10, 70 Phillip St
Sydney, NSW, 2000
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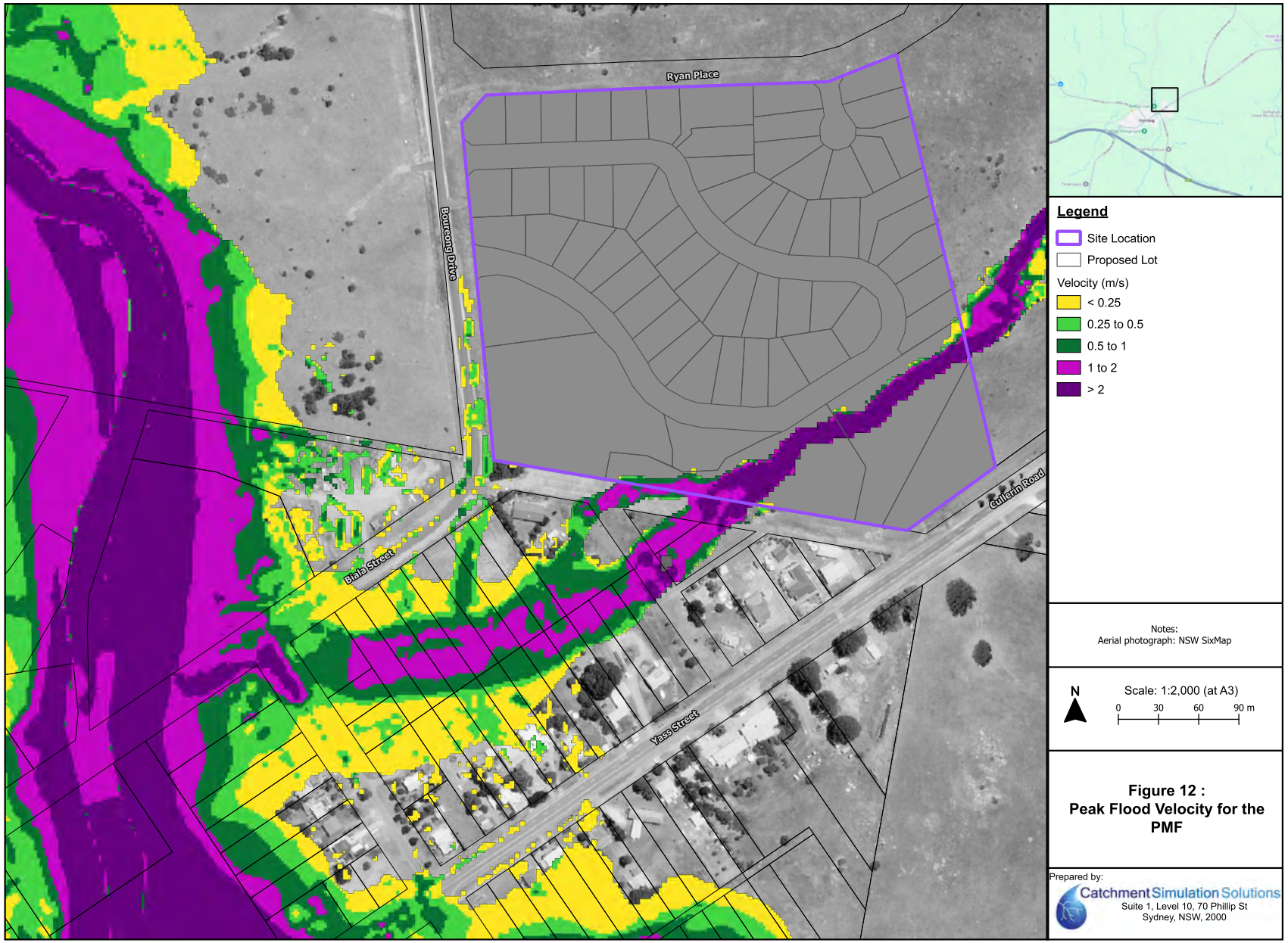
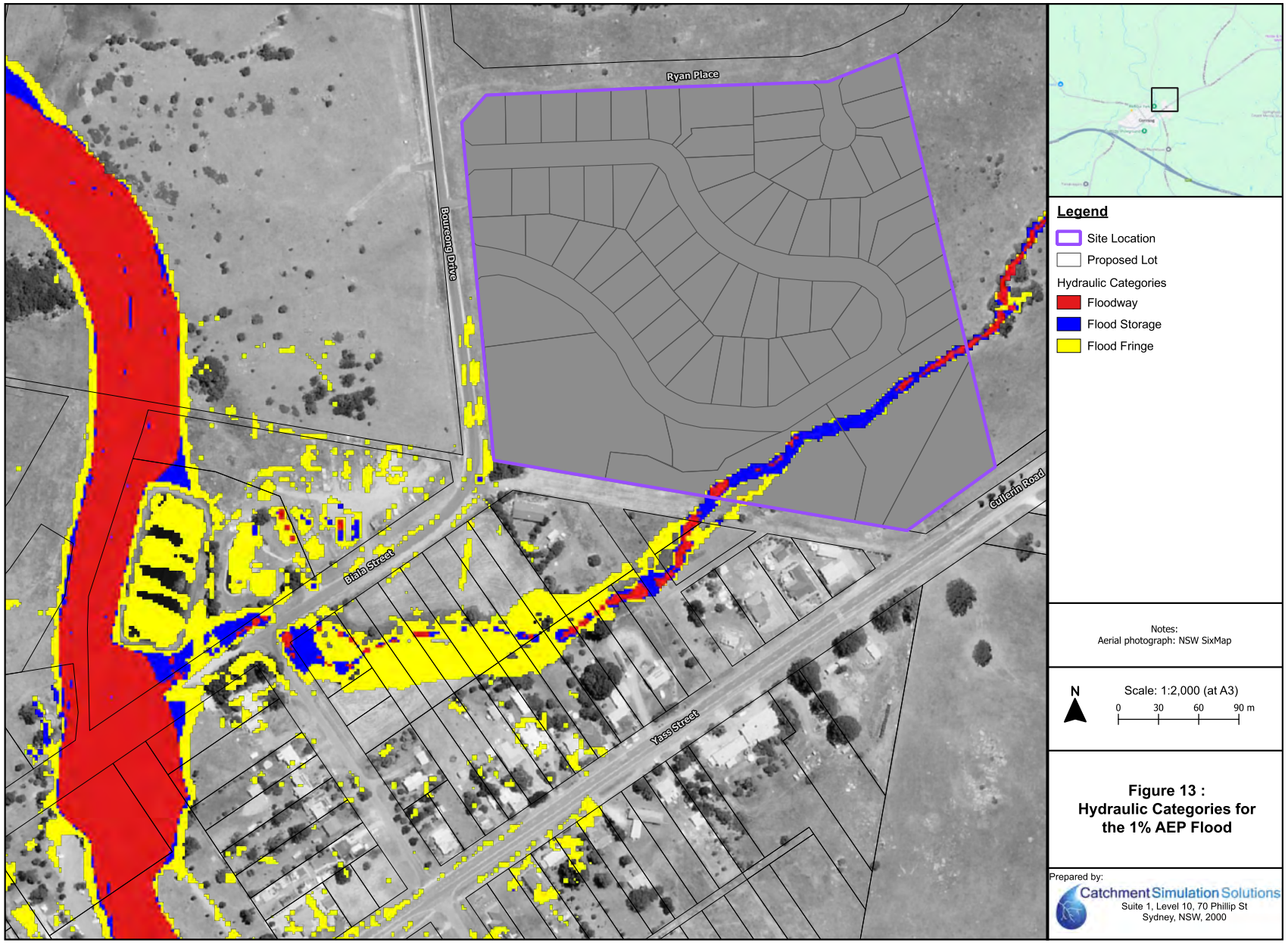
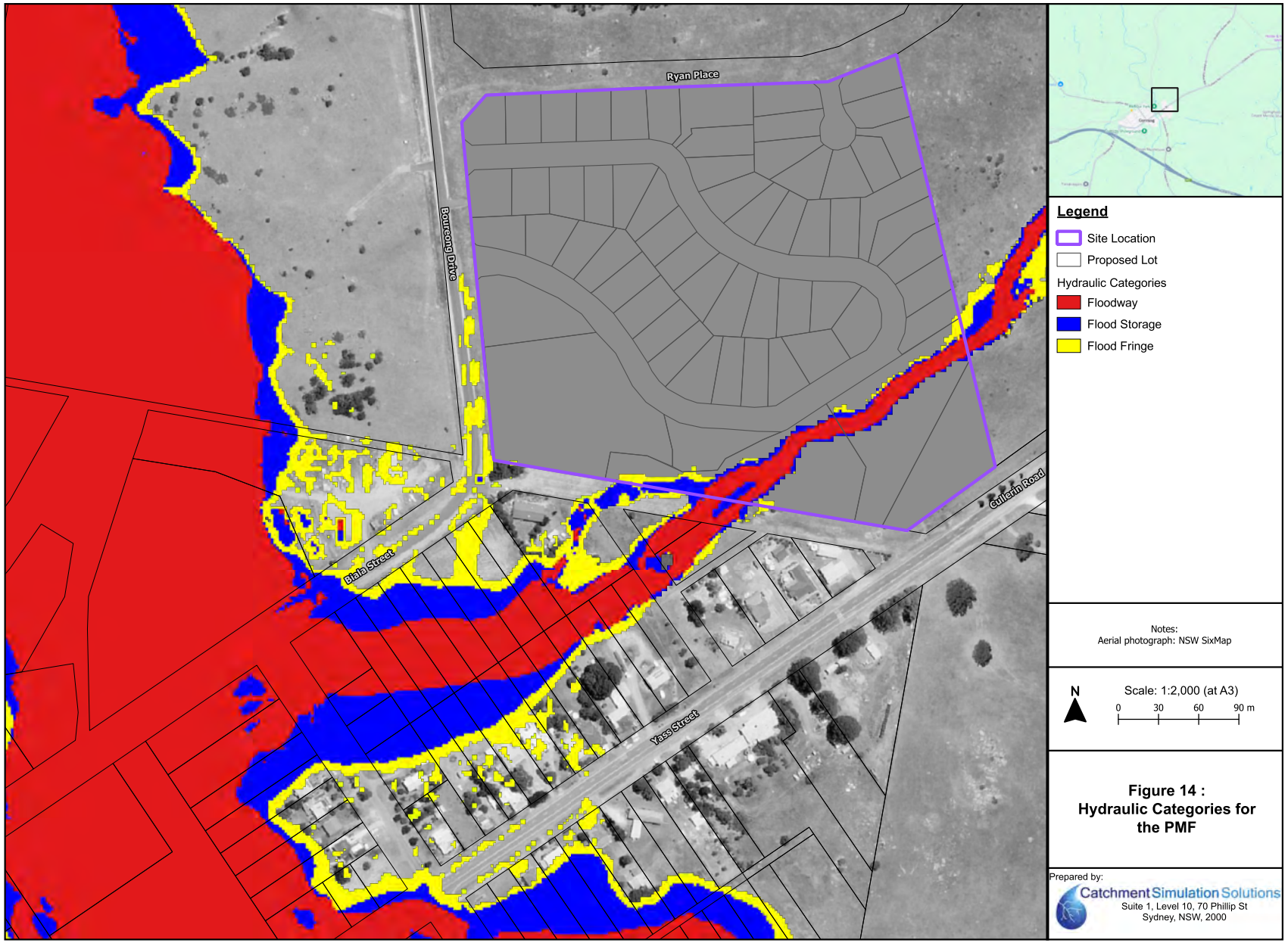
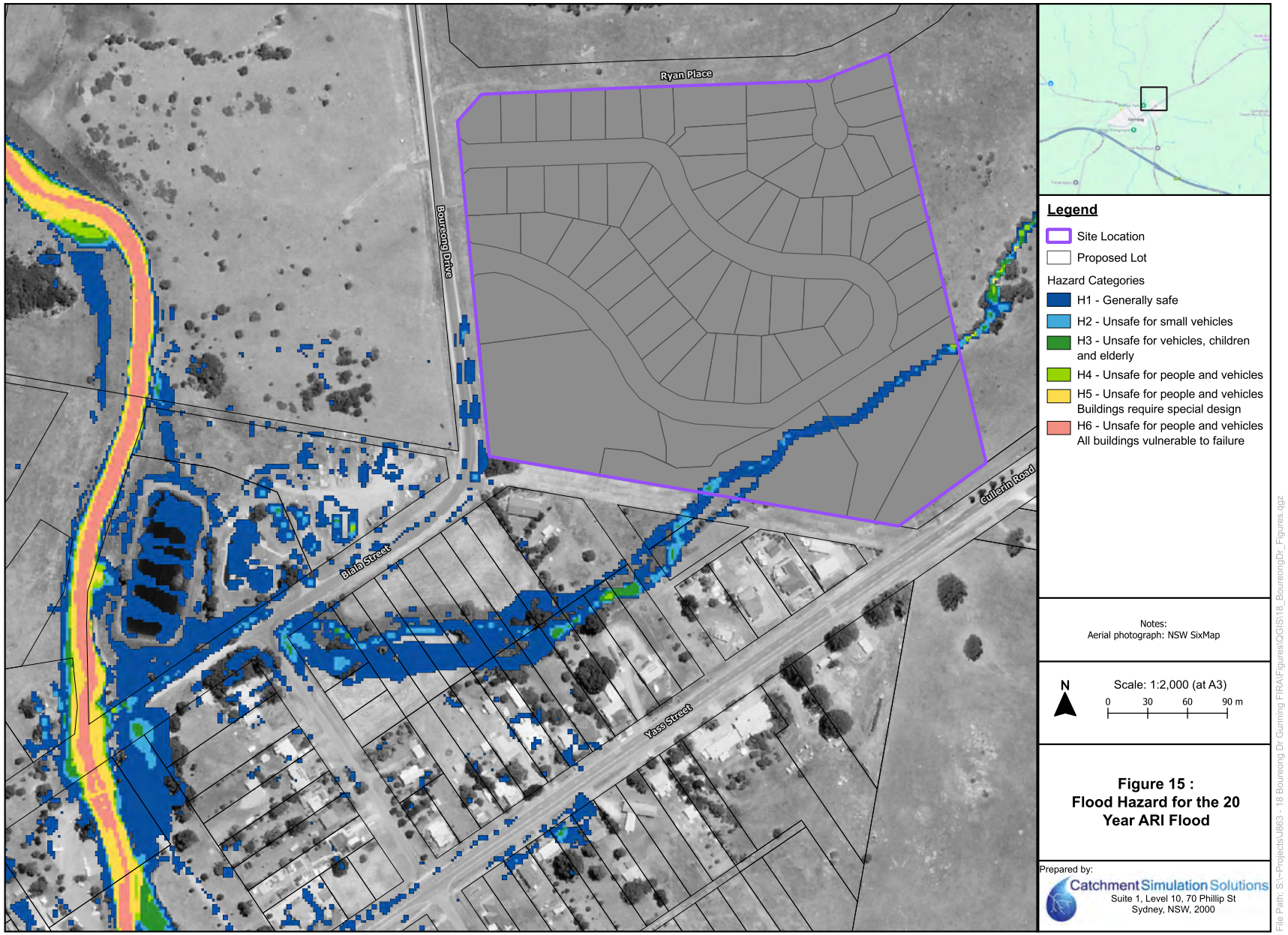
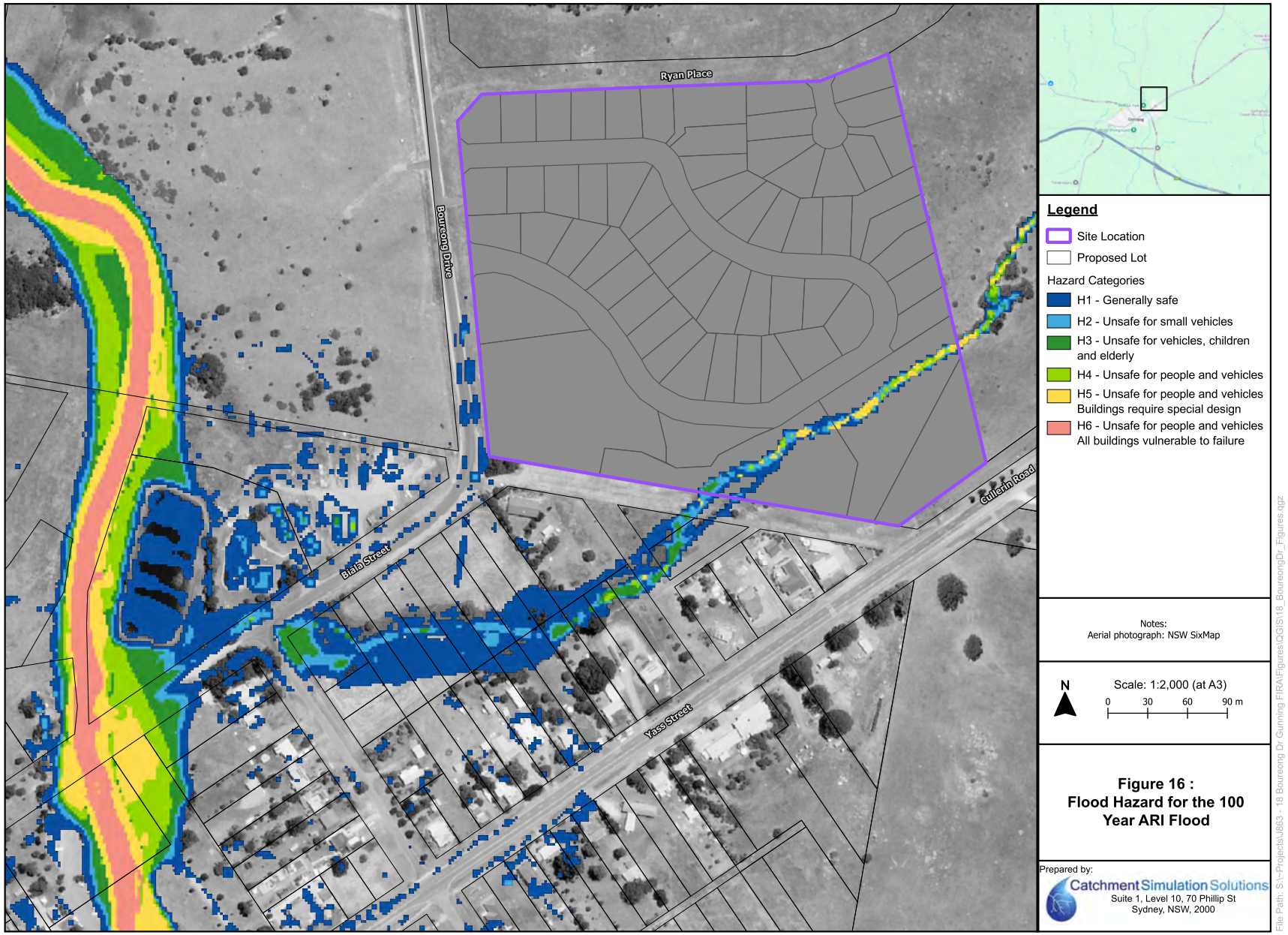

Ryan Place
Boureong Drive
Biala Street
Cullenn Road
Vass Street
Legend
Site Location
Proposed Lot
Velocity (m/s)
< 0.25
0.25 to 0.5
0.5 to 1
1 to 2
> 2
Notes:
Aerial photograph: NSW SixMap
N
Scale: 1:2,000 (at A3)
0 30 60 90 m
Figure 12 :
Peak Flood Velocity for the PMF
Prepared by:
Catchment Simulation Solutions
Suite 1, Level 10, 70 Phillip St
Sydney, NSW, 2000
File Path: S:\~Projects\J863 - 18 Boureong Dr Gunning FIRA\Figures\QGIS\18_BoureongDr_Figures.qgz


Ryan Place
Boureong Drive
Binla Street
Cullerin Road
Yass Street
Legend
Site Location
Proposed Lot
Hydraulic Categories
Floodway
Flood Storage
Flood Fringe
Notes:
Aerial photograph: NSW SixMap
N
Scale: 1:2,000 (at A3)
0 30 60 90 m
Figure 13 :
Hydraulic Categories for
the 1% AEP Flood
Prepared by:
Catchment Simulation Solutions
Suite 1, Level 10, 70 Phillip St
Sydney, NSW, 2000
File Path: S:\~Projects\J863 - 18 Boureong Dr Gunning FIRA\Figures\QGIS\18_BoureongDr_Figures.qgz


Ryan Place
Boureong Drive
Brida Street
Cullenn Road
Vass Street
Legend
Site Location
Proposed Lot
Hydraulic Categories
Floodway
Flood Storage
Flood Fringe
Notes:
Aerial photograph: NSW SixMap
N
Scale: 1:2,000 (at A3)
0 30 60 90 m
Figure 14 :
Hydraulic Categories for the PMF
Prepared by:
Catchment Simulation Solutions
Suite 1, Level 10, 70 Phillip St
Sydney, NSW, 2000
File Path: S:\~Projects\J863 - 18 Boureong Dr Gunning FIRA\Figures\QGIS\18_BoureongDr_Figures.qgz


Ryan Place
Boureong Drive
Biala Street
Cullenn Road
Yass Street
Legend
Site Location
Proposed Lot
Hazard Categories
H1 - Generally safe
H2 - Unsafe for small vehicles
H3 - Unsafe for vehicles, children and elderly
H4 - Unsafe for people and vehicles
H5 - Unsafe for people and vehicles Buildings require special design
H6 - Unsafe for people and vehicles All buildings vulnerable to failure
Notes:
Aerial photograph: NSW SixMap
N
Scale: 1:2,000 (at A3)
0 30 60 90 m
Figure 15 :
Flood Hazard for the 20 Year ARI Flood
Prepared by:
Catchment Simulation Solutions
Suite 1, Level 10, 70 Phillip St
Sydney, NSW, 2000
File Path: S:\~Projects\J863 - 18 Boureong Dr Gunning FIRA\Figures\QGIS\18_BoureongDr_Figures.qgz


Ryan Place
Boureong Drive
Biala Street
Cullenn Road
Yass Street
Legend
Site Location
Proposed Lot
Hazard Categories
H1 - Generally safe
H2 - Unsafe for small vehicles
H3 - Unsafe for vehicles, children and elderly
H4 - Unsafe for people and vehicles
H5 - Unsafe for people and vehicles Buildings require special design
H6 - Unsafe for people and vehicles All buildings vulnerable to failure
Notes:
Aerial photograph: NSW SixMap
N
Scale: 1:2,000 (at A3)
0 30 60 90 m
Figure 16 :
Flood Hazard for the 100 Year ARI Flood
Prepared by:
Catchment Simulation Solutions
Suite 1, Level 10, 70 Phillip St
Sydney, NSW, 2000
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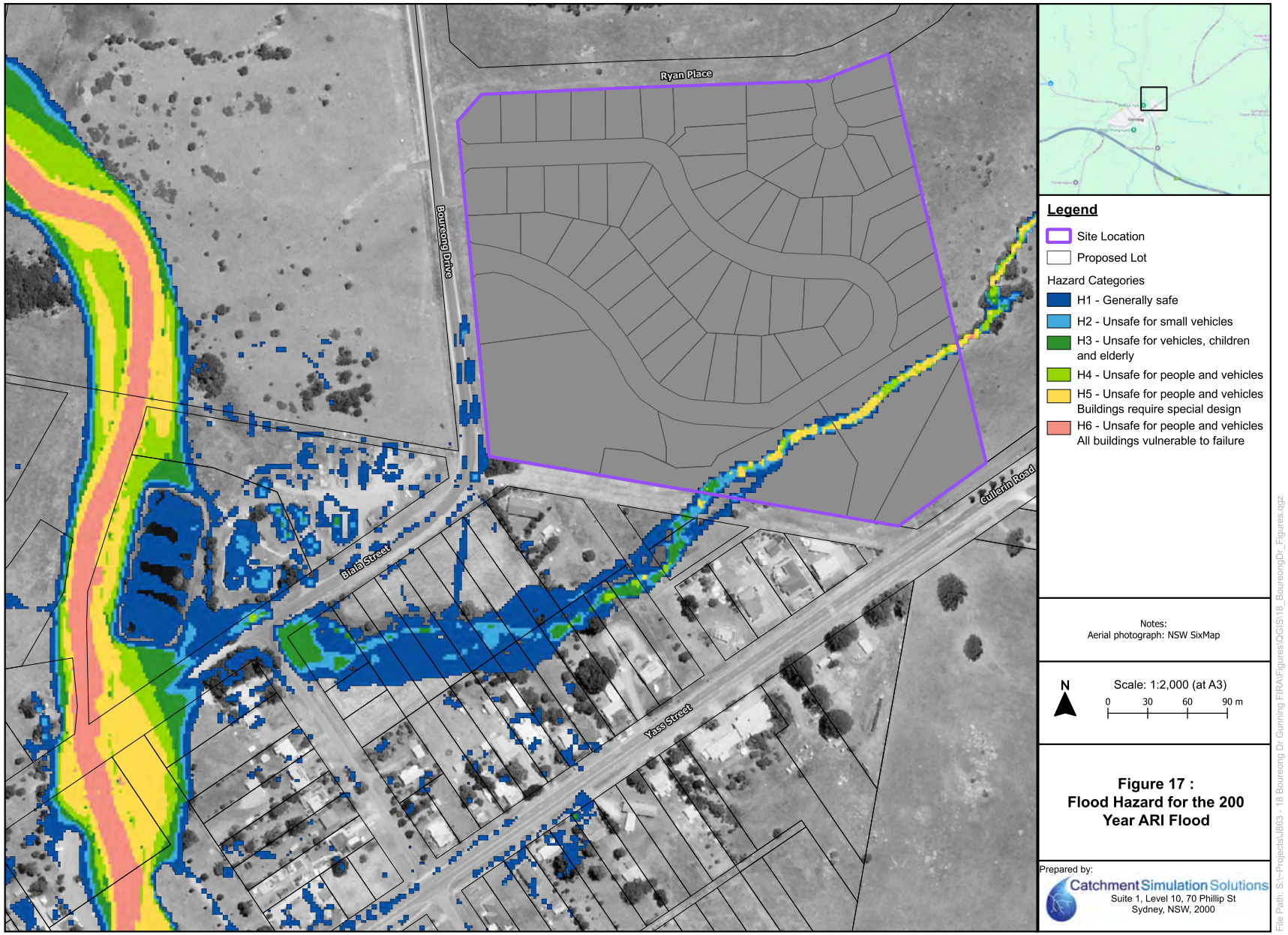
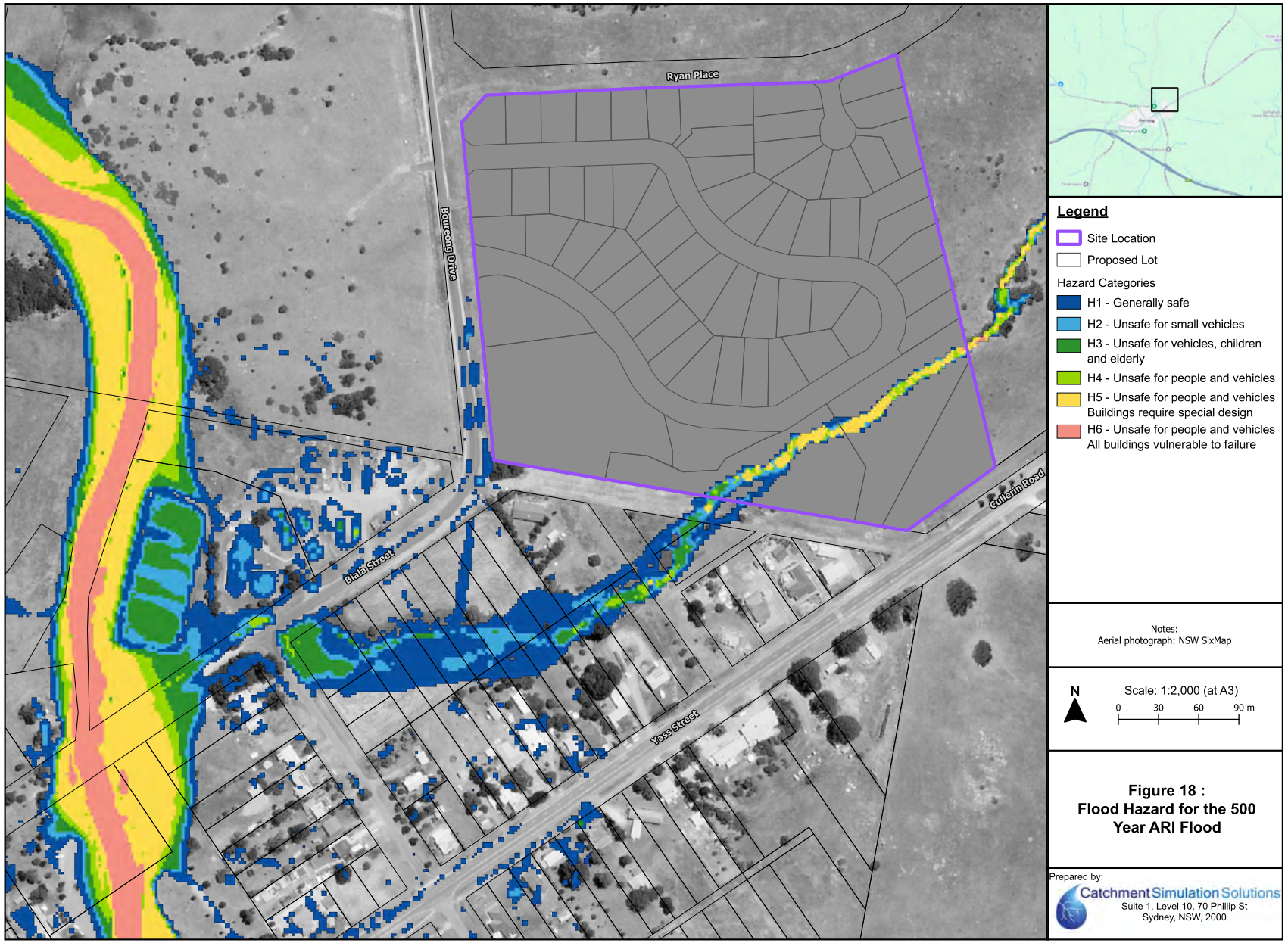
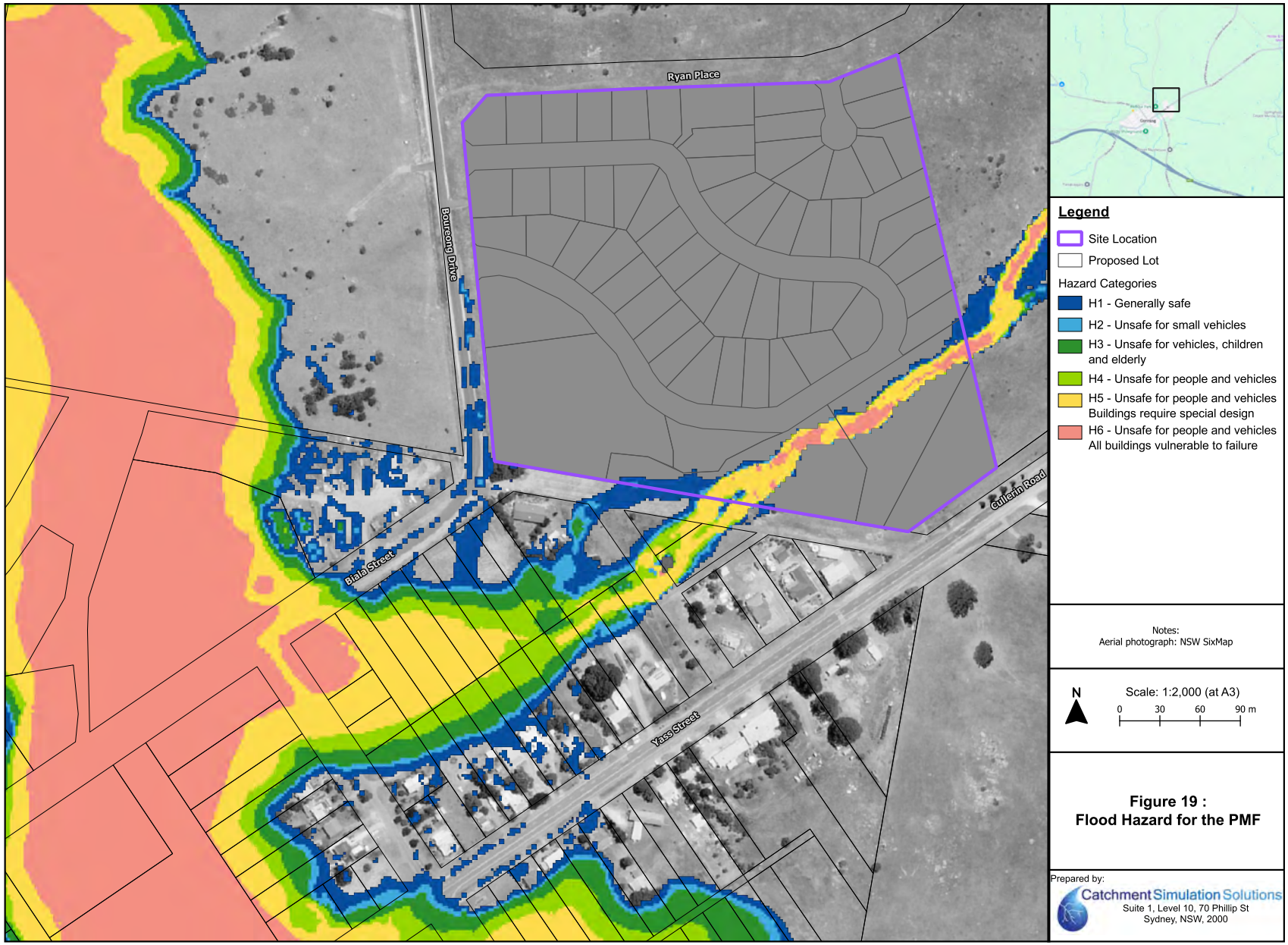
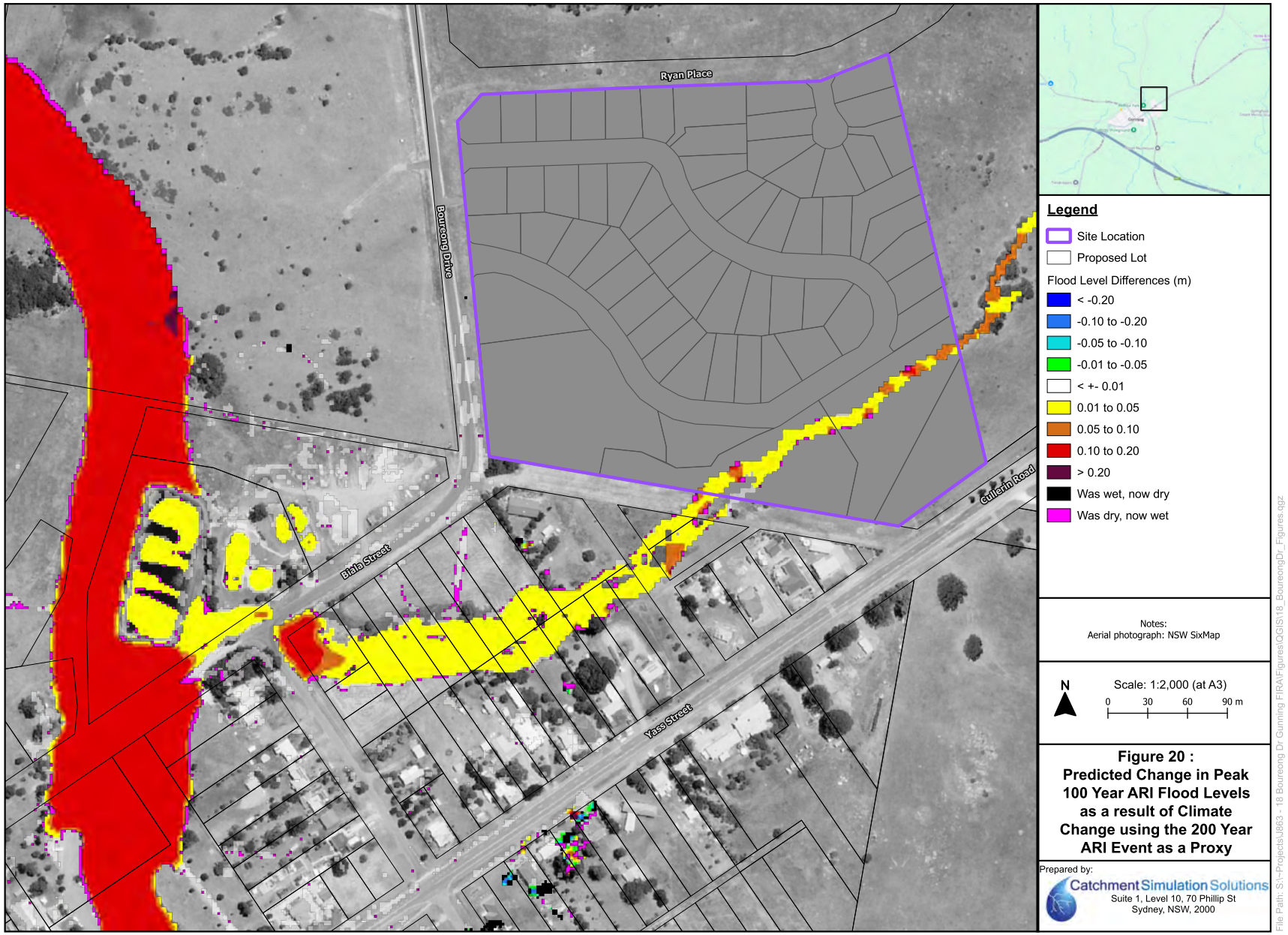
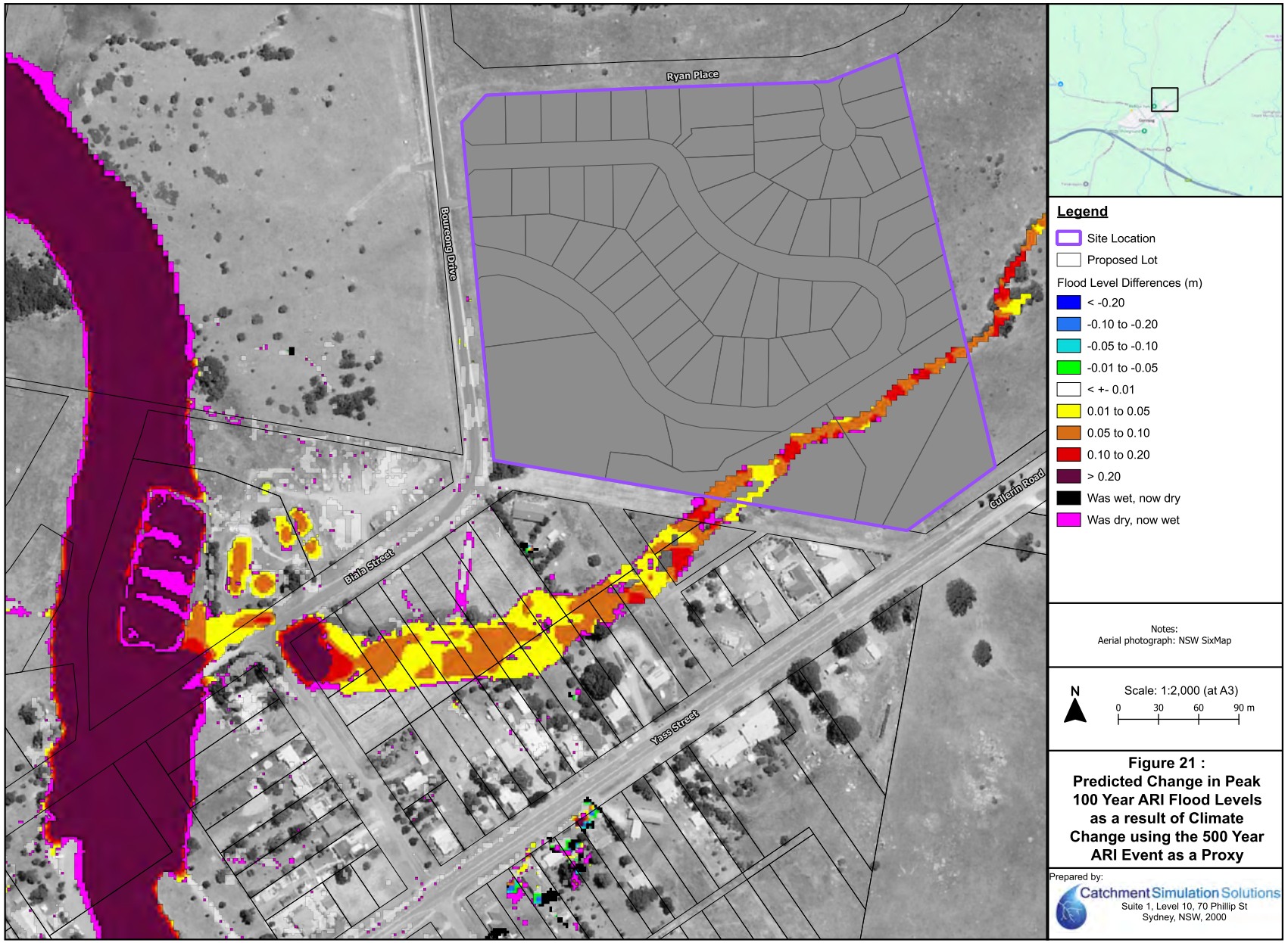
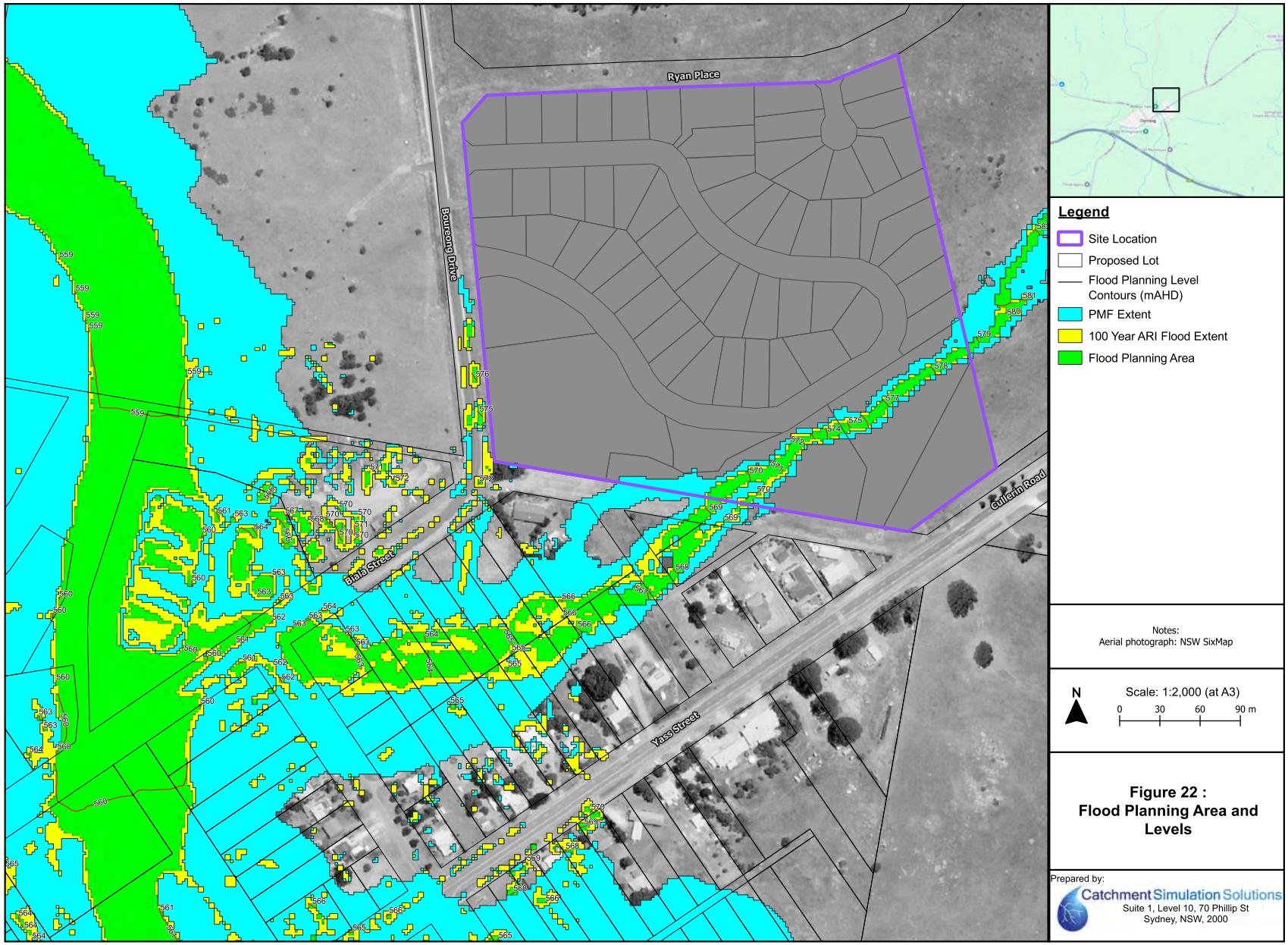

Ryan Place
Boureong Drive
Biala Street
Cullenn Road
Yass Street
Legend
Site Location
Proposed Lot
Hazard Categories
H1 - Generally safe
H2 - Unsafe for small vehicles
H3 - Unsafe for vehicles, children and elderly
H4 - Unsafe for people and vehicles
H5 - Unsafe for people and vehicles Buildings require special design
H6 - Unsafe for people and vehicles All buildings vulnerable to failure
Notes:
Aerial photograph: NSW SixMap
N
Scale: 1:2,000 (at A3)
0 30 60 90 m
Figure 17 :
Flood Hazard for the 200 Year ARI Flood
Prepared by:
Catchment Simulation Solutions
Suite 1, Level 10, 70 Phillip St
Sydney, NSW, 2000
File Path: S:\~Projects\J863 - 18 Boureong Dr Gunning FIRA\Figures\QGIS\18_BoureongDr_Figures.qgz

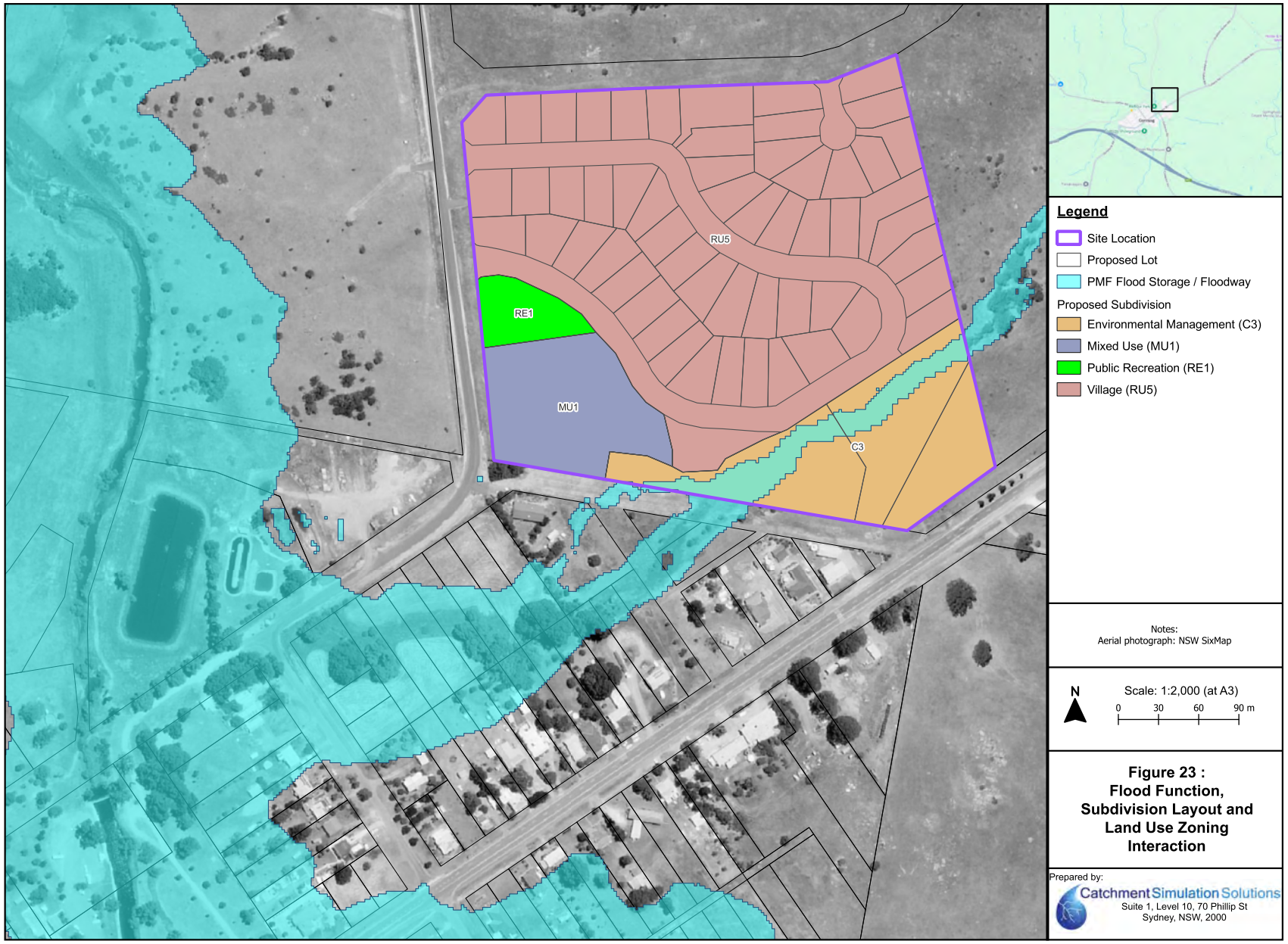

Ryan Place
Boureong Drive
Biala Street
Cullenn Road
Yass Street
Legend
Site Location
Proposed Lot
Hazard Categories
H1 - Generally safe
H2 - Unsafe for small vehicles
H3 - Unsafe for vehicles, children and elderly
H4 - Unsafe for people and vehicles
H5 - Unsafe for people and vehicles Buildings require special design
H6 - Unsafe for people and vehicles All buildings vulnerable to failure
Notes:
Aerial photograph: NSW SixMap
N
Scale: 1:2,000 (at A3)
0 30 60 90 m
Figure 18 :
Flood Hazard for the 500 Year ARI Flood
Prepared by:
Catchment Simulation Solutions
Suite 1, Level 10, 70 Phillip St
Sydney, NSW, 2000
File Path: S:\~Projects\J863 - 18 Boureong Dr Gunning FIRA\Figures\QGIS\18_BoureongDr_Figures.qgz


Ryan Place
Boureong Drive
Biala Street
Cullenn Road
Yass Street
Legend
Site Location
Proposed Lot
Hazard Categories
H1 - Generally safe
H2 - Unsafe for small vehicles
H3 - Unsafe for vehicles, children and elderly
H4 - Unsafe for people and vehicles
H5 - Unsafe for people and vehicles Buildings require special design
H6 - Unsafe for people and vehicles All buildings vulnerable to failure
Notes:
Aerial photograph: NSW SixMap
N
Scale: 1:2,000 (at A3)
0 30 60 90 m
Figure 19 :
Flood Hazard for the PMF
Prepared by:
Catchment Simulation Solutions
Suite 1, Level 10, 70 Phillip St
Sydney, NSW, 2000
File Path: S:\~Projects\J863 - 18 Boureong Dr Gunning FIRA\Figures\QGIS\18_BoureongDr_Figures.qgz


Ryan Place
Boureong Drive
Biala Street
Yass Street
Cullerin Road
Legend
Site Location
Proposed Lot
Flood Level Differences (m)
< -0.20
-0.10 to -0.20
-0.05 to -0.10
-0.01 to -0.05
< +- 0.01
0.01 to 0.05
0.05 to 0.10
0.10 to 0.20
> 0.20
Was wet, now dry
Was dry, now wet
Notes:
Aerial photograph: NSW SixMap
N
Scale: 1:2,000 (at A3)
0 30 60 90 m
Figure 20 :
Predicted Change in Peak 100 Year ARI Flood Levels as a result of Climate Change using the 200 Year ARI Event as a Proxy
Prepared by:
Catchment Simulation Solutions
Suite 1, Level 10, 70 Phillip St
Sydney, NSW, 2000
File Path: S:\~Projects\J863 - 18 Boureong Dr Gunning FIRA\Figures\QGIS\18_BoureongDr_Figures.qgz


Ryan Place
Boureong Drive
Birla Street
Yass Street
Cullerin Road
Legend
Site Location
Proposed Lot
Flood Level Differences (m)
< -0.20
-0.10 to -0.20
-0.05 to -0.10
-0.01 to -0.05
< +- 0.01
0.01 to 0.05
0.05 to 0.10
0.10 to 0.20
> 0.20
Was wet, now dry
Was dry, now wet
Notes:
Aerial photograph: NSW SixMap
N
Scale: 1:2,000 (at A3)
0 30 60 90 m
Figure 21 :
Predicted Change in Peak 100 Year ARI Flood Levels as a result of Climate Change using the 500 Year ARI Event as a Proxy
Prepared by:
Catchment Simulation Solutions
Suite 1, Level 10, 70 Phillip St
Sydney, NSW, 2000
File Path: S:\~Projects\J863 - 18 Boureong Dr Gunning FIRA\Figures\QGIS\18_BoureongDr_Figures.qgz


Ryan Place
Boureong Drive
Brais Street
Cullenn Road
Yass Street
Legend
Site Location
Proposed Lot
Flood Planning Level Contours (mAHD)
PMF Extent
100 Year ARI Flood Extent
Flood Planning Area
Notes:
Aerial photograph: NSW SixMap
N
Scale: 1:2,000 (at A3)
0 30 60 90 m
Figure 22 :
Flood Planning Area and Levels
Prepared by:
Catchment Simulation Solutions
Suite 1, Level 10, 70 Phillip St
Sydney, NSW, 2000
File Path: S:\~Projects\J863 - 18 Boureong Dr Gunning FIRA\Figures\QGIS\18_BoureongDr_Figures.qgz

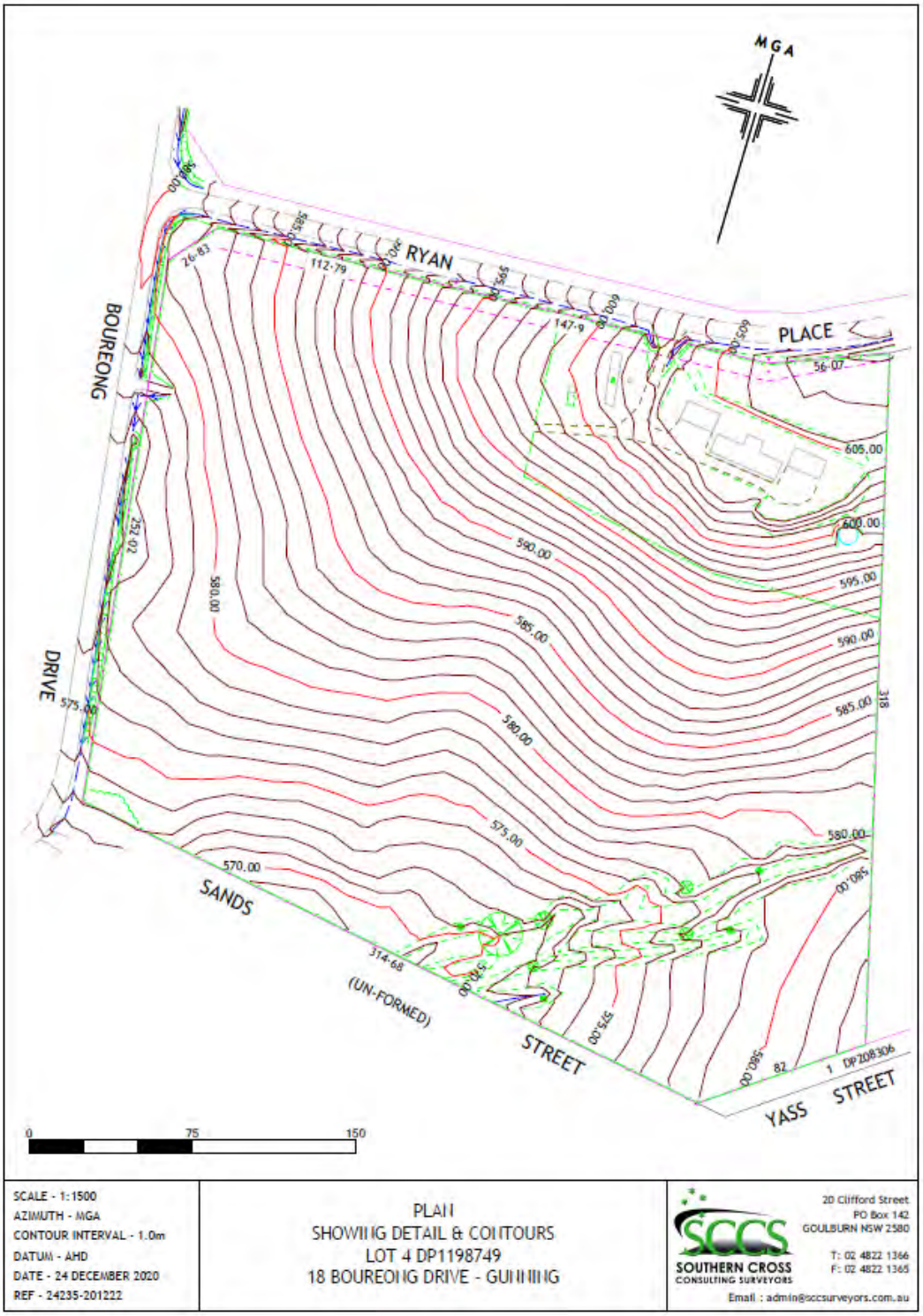

RU5
RE1
MU1
C3
Legend
Site Location
Proposed Lot
PMF Flood Storage / Floodway
Proposed Subdivision
Environmental Management (C3)
Mixed Use (MU1)
Public Recreation (RE1)
Village (RU5)
Notes:
Aerial photograph: NSW SixMap
N
Scale: 1:2,000 (at A3)
0 30 60 90 m
Figure 23 :
Flood Function,
Subdivision Layout and
Land Use Zoning
Interaction
Prepared by:
Catchment Simulation Solutions
Suite 1, Level 10, 70 Phillip St
Sydney, NSW, 2000
File Path: S:\~Projects\J863 - 18 Boureong Dr Gunning FIRA\Figures\QGIS\18_BoureongDr_Figures.qgz

APPENDIX B
SITE SURVEY

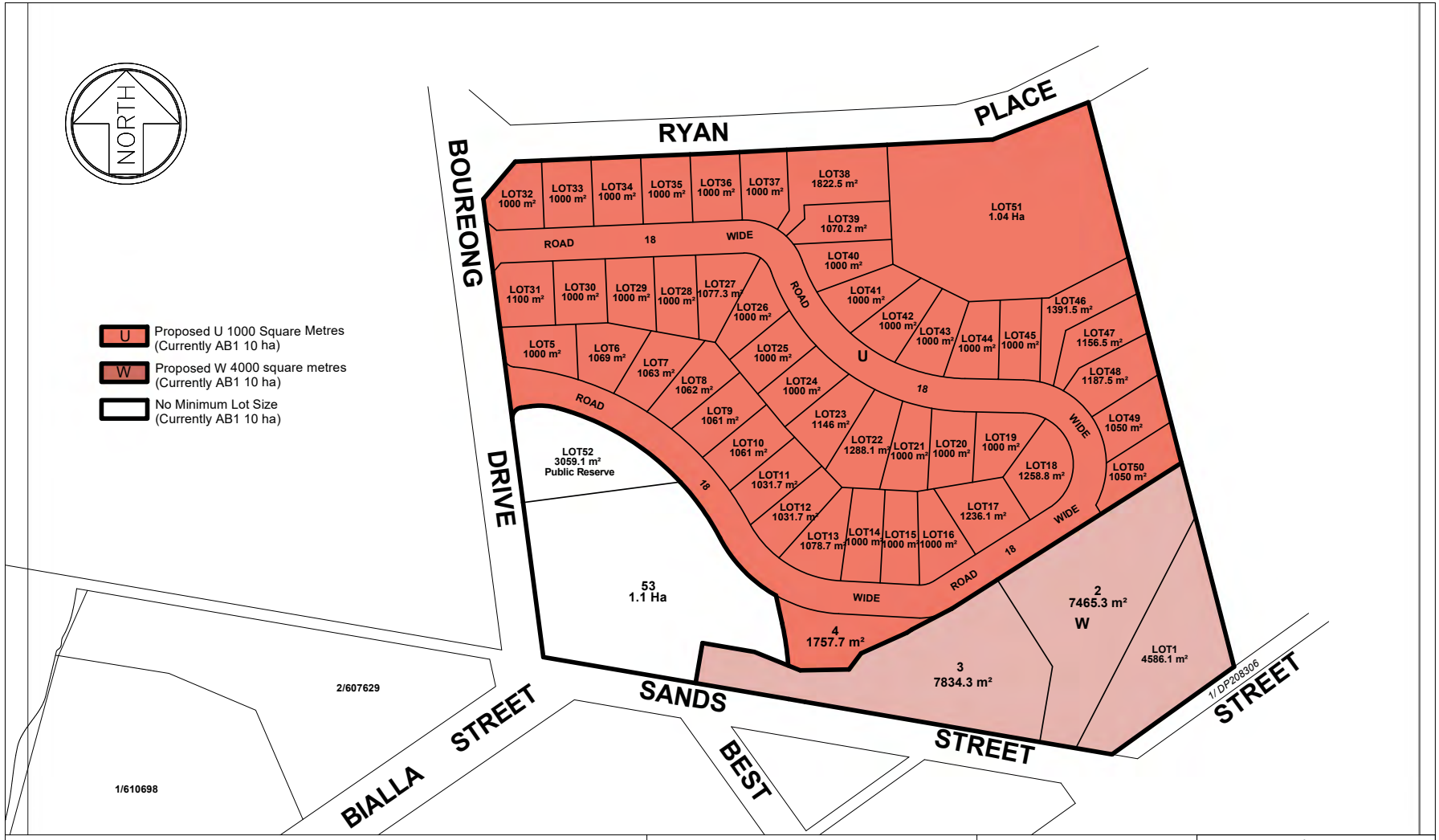
ANNEXURE 3

Site Contour Plan

(Plan Source: Southern Cross Consulting Surveyors)



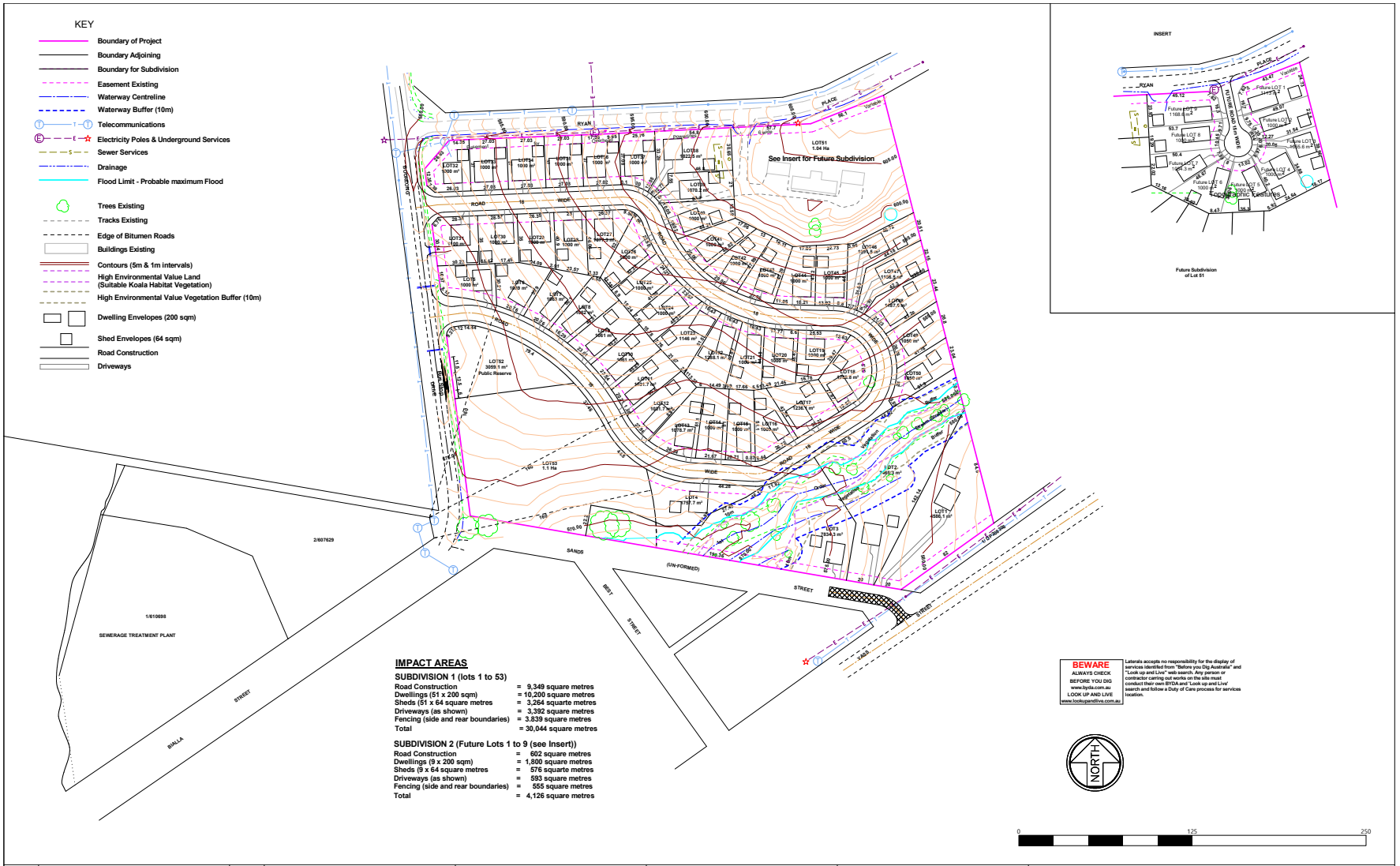
APPENDIX C
CONCEPT DESIGN



PLAN
Showing Planning Proposal
Lot 4 DP 1198749
18 Boureong Drive, Gunning

Laterals Planning
Upstairs, 213 Auburn Street (PO Box 1326)
Goulburn NSW 2580
Phone: 02 4821 0973 Fax 02 3821 0973
18C Winter Street, Tinonee NSW 2430
Mobile: 0427 210 973

Sheet No: 1
No of Sheets: 1
Date: 24 September 2024
PLAN NO: 20022
LOT SIZE MAP



Issue	Amendment	Date
F	Amended Subdivision Design	24/9/2024
E	Potential Development & Impact Areas	7/8/2024
D	Amended Subdivision Design	12/1/2024
C	Stream Detail and Lot reduction	25/1/2023
B	Amended Design for STP	8/6/2022
A	Original	1/7/2021

Surveyed : Southern Cross Consulting Surveyors
Designed : R Mowle
Drawn : K Allen
Checked : R Mowle
Datum : AHD
Laterals Ref : 20022

SCALE
1:1250 on A1

Sheet No.	No. of Sheets	Sheet size
2	3	A1

LATERALS ENGINEERING & MANAGEMENT
LATERALS PLANNING

1st Floor, 213 Auburn Street
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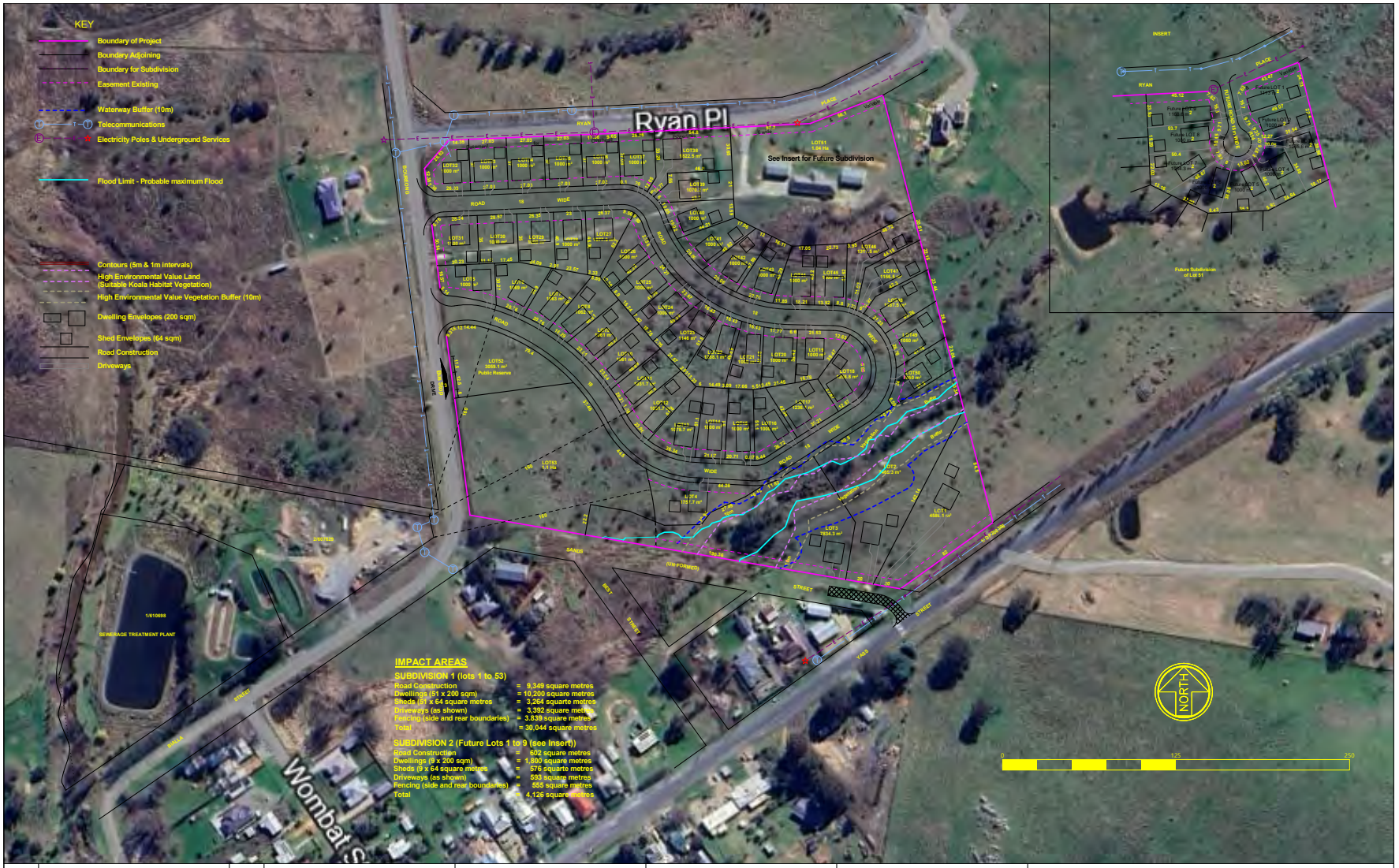
Ph: 4821 0973 Fax: 482 0777
48 Johns River Road, Johns River NSW 2443
Mobile 0427 210 973

Sheet Subject
CONCEPT SUBDIVISION
TOPOGRAPHIC DETAILS

UPPER LACHLAN SHIRE COUNCIL
LOT 4 DP 1198749
18 BOUREONG DRIVE, GUNNING
PLANNING PROPOSAL



Issue	Amendment	Date
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Surveyed : Southern Cross Consulting Surveyors
Designed : R Mowle
Drawn : K Allen
Checked : R Mowle
Datum : AHD
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SCALE
1:1250 on A1

Sheet No.	No. of Sheets	Sheet size
3	3	A1

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LATERALS PLANNING

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Goulburn NSW 2580
Ph: 4821 0973 Fax: 482 0777
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Sheet Subject
CONCEPT SUBDIVISION AERIAL PHOTOGRAPH

UPPER LACHLAN SHIRE COUNCIL
LOT 4 DP 1198749
18 BOUREONG DRIVE, GUNNING
PLANNING PROPOSAL

Geosyntec consultants

engineers | scientists | innovators

Preliminary Site Investigation

18 Boureong Drive, Gunning, NSW 2581

Stuart and Catherine Duke, Care of Laterals Planning Pty Ltd
3 October 2024

AU124119 R01

Geosyntec consultants

Quality Management

Document Distribution

Issue/Revision	Issue 1	Revision 1	Revision 2
Remarks	DRAFT	Final	
Date	6 September 2024	3 October 2024	
Prepared by	Chris Navaratnam Environmental Scientist	Chris Navaratnam Environmental Scientist	
Signature	DRAFT		
Reviewed by	Priya Dass Senior Environmental Scientist	Priya Dass Senior Environmental Scientist	
Signature	DRAFT		
Reviewed by	Tristan Goodbody Senior Engineer CEnvP-SC41197	Tristan Goodbody Senior Engineer CEnvP-SC41197	
Signature	DRAFT		
File reference	AU124119 R01 Stuart & Catherine Duke Gunning 6Sept24	AU124119 R01 Stuart & Catherine Duke Gunning 3Oct24	
Distribution	• Stuart and Catherine Duke, Care of Laterals Planning Pty Ltd • Geosyntec Electronic File	• Stuart and Catherine Duke, Care of Laterals Planning Pty Ltd • Geosyntec Electronic File	

This report was prepared in accordance with the scope of services set out in the contract between Geosyntec Consultants Pty Ltd (ABN 23 154 745 525) and the client.

Geosyntec Consultants Pty Ltd
ABN 23 154 745 525
www.geosyntec.com.au

Geosyntec consultants

Executive Summary

Geosyntec Consultants Pty Ltd (Geosyntec) was commissioned by Mr. Stuart and Mrs. Catherine Duke (the Client), care of Laterals Planning Pty Ltd to conduct a Preliminary Site Investigation (PSI) with limited sampling at 18 Boureong Drive, Gunning, NSW, 2581 (the site). The site is legally identified as Lot 4 in Deposited Plan (DP) 1198749 and occupies an area of approximately 10.9 hectares (ha). It is understood that a planning proposal is proposed to amend the Upper Lachlan Local Environmental Plan (LEP) 2010 to rezone the site from RU4 Primary Production to RU5 Village, followed by subdivision of the site to form residential lots. The proposed subdivision will include residential lots, a public reserve, and a riparian buffer zone associated with an unnamed creek (a tributary of Meadow Creek to the west) located within the southeastern portion of the site.

A letter from the NSW Environment Protection Authority (EPA) to Ms Ann Martin of Department of Planning, Housing and Infrastructure (Referenced Gunning Heights Estate- PP-2024-121, dated 23 May 2024) was provided by the Client. Appendix A of the letter required that a contamination assessment in accordance with the State Environmental Planning Policy (Resilience and Hazards) 2021, Chapter 4- Remediation of Land be completed to facilitate the Planning Proposal.

The objective of the PSI is to identify the potential for land contamination associated with past and present land use and to determine whether further assessment is required.

The scope of works included a desktop review of relevant historical and environmental background data, a detailed site walkover, limited sampling of six boreholes to a maximum of 0.3m below ground level (mBGL), collection of two sediment and surface water samples at the entrance and exit points of the unnamed creek located within the southeastern portion of the site, laboratory analysis of the collected samples and the preparation of this PSI report.

Based on the findings of this assessment, Geosyntec concludes the following:

- Based on the reviewed historical information, the site has largely existed as undeveloped farmland until 2015 (anecdotally confirmed by the site owner), when a residential dwelling, accompanying storage sheds and water tank was construction within the northeastern portion of the site.
- No visual or olfactory indicators of contamination were observed across the site surfaces or within the six soil boreholes advanced across the site and two sediment samples collected from an unnamed creek in the southeastern section of the site.
- Four stockpiles comprising a mixture of topsoils and natural clay soils excavated from the site, and one other stockpile containing imported shale gravel was identified in the northeastern section of the site. Based on visual inspection of the material, the stockpiled materials are considered to present a low risk to human health and ecological receptors.
- Soil and sediment analytical results were below the adopted human health and ecological criteria for low-density residential land use and urban residential and public and open space use. Based on the soil and sediment analytical results potential risk to human health and ecological receptors is considered to be low.
- Surface water results collected from the eastern and southern site boundary points of the creek recorded concentrations below the adopted assessment criteria except for select heavy metal analytes (discussed in Section 8.6) detected within the sample (SW1E) collected from the eastern site entry point of the creek. Fraction 2 TRH, Fraction 3 TRH and Fraction 4 TRH were also detected in this sample. The recorded concentrations are considered representative of naturally occurring background ranges or could also be due to offsite source/s. Given that surface water contained within the creek is not utilised for drinking water or irrigation purposes and the water migrating offsite does not appear to be impacted as denoted from the analytical

results of SW1W from the site exit point, the recorded exceedances are considered to present a low risk to current and future site and offsite receptors.

- Based on the findings of this assessment, historical information, the site's environmental setting, and the proposed residential subdivision no potential source pathway receptor linkages were identified.
- The site is considered suitable for the proposed subdivision. No further detailed environmental investigation is deemed warranted to support the proposed subdivision and development.

Geosyntec consultants

Table of Contents

Appendices

Tables

1 Introduction

1.1 Background

Geosyntec Consultants Pty Ltd (Geosyntec) was commissioned by Mr. Stuart and Mrs. Catherine Duke (the Client), care of Laterals Planning Pty Ltd to conduct a Preliminary Site Investigation (PSI) with limited sampling at 18 Boureong Drive, Gunning, NSW, 2581 (the site). The site is legally identified as Lot 4 in Deposited Plan (DP) 1198749 and occupies an area of approximately 10.9 hectares (ha). It is understood that a planning proposal is proposed to amend the Upper Lachlan Local Environmental Plan (LEP) 2010 to rezone the site from RU4 Primary Production to RU5 Village, followed by subdivision of the site to form residential lots. The proposed subdivision will include residential lots, a public reserve, and a riparian buffer zone associated with an unnamed creek (a tributary of Meadow Creek to the west) located within the southeastern portion of the site.

A letter from the NSW Environment Protection Authority (EPA) to Ms Ann Martin of Department of Planning, Housing and Infrastructure (Referenced Gunning Heights Estate- PP-2024-121, dated 23 May 2024) was provided by the Client. Appendix A of the letter required that a contamination assessment in accordance with the State Environmental Planning Policy (Resilience and Hazards) 2021, Chapter 4- Remediation of Land be completed to facilitate the Planning Proposal.

1.2 Objective

The objective of the PSI is to identify the potential for land contamination associated with past and present land use and to determine whether further assessment is required.

1.3 Scope of Work

The PSI scope of work included:

- Project management including fieldwork organisation, subcontractor management and client liaison.
- Site investigation preliminaries, including preparation of a specific Job Hazard Analysis/ Safe Work Method Statement (JHA/SWMS) prior to commencing work on site.
- A desktop review of information on site history, including a review of the NSW EPA Contaminated Sites Registers, historical aerial photography, published maps, the Department of Natural Resources bore search, and geological, soil, salinity, and hydrogeological information as provided in a subcontracted Lotsearch Report.
- Completion of Before You Dig Australia (BYDA) searches.
- Attendance at site by an experienced Geosyntec Field Consultant to complete a detailed site inspection and targeted soil sampling program, comprising the following:
    - Implementation of a limited intrusive investigation based on potential areas of environmental concern and general site distribution based on the conceptual subdivision plan, presented within Appendix B.
    - Collection of six (6) representative soil samples from six (6) shallow boreholes advanced to a maximum depth of 0.3 m.
    - Logging of boreholes and encountered soil profiles in general accordance with AS1726: Geotechnical Site Investigations.

  - Collection of two (2) surface water and two (2) sediment samples at the entry and exit points of the unnamed creek located within the site, where the stream crossed the site boundaries.
  - Collection of field parameters (dissolved oxygen, redox, temperature, and conductivity) for the surface water samples using a suitable water quality meter.
  - The sampling locations are presented within Appendix A, Figure 2.
  - Laboratory analysis for six (6) near surface soil samples and two (2) stream sediment samples for eight priority metals and metalloids (arsenic, cadmium, chromium, lead, nickel, zinc and mercury), Total Recoverable Hydrocarbons (TRHs), Polycyclic Aromatic Hydrocarbons (PAHs), Benzene, Toluene, Ethylbenzene and Xylene (BTEX), Organochlorine Pesticides (OCP), and asbestos (NEPM 500ml, excluding the stream sediment samples) at a National Association of Testing Authorities (NATA) accredited laboratory. Two surface water samples were analysed for heavy metals and metalloids (8), OCP, TRH, BTEX, PAH and nutrients (phosphate, nitrate, nitrite and ammonia).

- Preparation of this PSI report in general accordance with the NSW EPA (2020) Consultants Reporting on Contaminated Land – Contaminated Land Guidelines and NEPC (1999) National Environment Protection (Assessment of Site Contamination) Measure, as amended in April 2013 [referred to herein as NEPM (2013)] guidelines.

2 Site Identification and Description

2.1 Site Identification

The site location is presented Figure 1, in Appendix A. A Site Layout Plan showing key site features and sampling locations is shown in Figure 2, Appendix A. The site identification and land use details are presented in Table 2.1.

Table 2.1: Site Identification.

Title	Details
Street Address:	18 Boureong Drive, Gunning, NSW, 2581
Property Description:	Lot 4, Deposited Plan (DP) 1198749
Current Site Ownership:	Private Property (Site Owner: Stuart and Catherine Duke)
Geographical Coordinates: GDA2020-MGA56	Easting: 158934.147 Northing: 614554.215
Property Size:	Approximately 10.9 hectares.
Local Government Area:	Upper Lachlan Shire Council
Zoning – Existing:	RU1 Primary Production Small Lots (Upper Lachlan Local Environmental Plan 2010)

2.2 Proposed Development

Conceptual subdivision plans '*Concept Subdivision Aerial Photograph, Lot 4 DP1198749, 18 Boureong Drive, Gunning'* Prepared by Laterals Planning, Referenced Sheet 3, Reference No. 20022, amended dated 24 September 2024, indicates that the site is proposed to be subdivided into 62 lots (including future 9 lots subdivision of the proposed lot 51), with an access road constructed, extending from Boureong Drive to the west. The development and subdivision plans are included within Appendix B. The proposed subdivision comprises the creation of 60 residential lots, two lots within a public reserve, new roadway and a riparian buffer zone. The subdivision plan also shows a road, Sands Street, to the immediate south of the site (offsite), which connects Yass Street and Bialla Street and is marked as unformed on the plan. A proposed Best Street is to the immediate south of the proposed Sands Street.

2.3 Site Conditions

At the time of the site works, the site comprised vacant land (western and southern portions) and a residential property, chicken coop, and two equipment storage sheds (northeastern portion). A shallow creek (the unnamed creek) was observed within the southeastern portion of the site, flowing from the northeast to the southwest (refer to Figure 2, Appendix A).

The site condition based on published information, review of past reports and site observations made during the fieldwork are presented in Table 2.2.

Table 2.2: General Site Conditions.

Title	Details
Topography and Drainage:	Topographical data indicates that the site is between a topographical elevation of 569m and 607m Australian Height Datum (m AHD). The site was generally observed to fall from the northeast to the southwest, except for the southeastern area of the site, which falls to the west towards the unnamed creek. Slopes were estimated to range from 10% in the west to 20% in the northeast of the site.

Title	Details
	Surface water is expected to infiltrate directly through vegetated areas and exposed soils surfaces, localised ponding within surface depressions or flow towards the unnamed creek located within the southeastern portion of the site.
Boundary Condition:	A barbed wire picketed fence line was observed along the site boundaries and was noted to be in good condition, with minor damage noted along the southern boundary. Site entrances from Ryan Place at the northeastern site boundary and from Boureong Drive at the western site boundary were gated.
Vegetation:	Vegetation at the site included grass cover, low-lying shrubs and trees across most of the site. No evidence of vegetation stress was observed during the site inspection. Localised areas of the site were observed to be unvegetated which was attributed to livestock grazing, anecdotally confirmed by the client during the site inspection.
Presence of Drums, Wastes and Fill Materials:	No evidence of drums storage was observed on site. Five stockpiles were identified within the site. Four of the five stockpiles were located north of the residential property in the northeastern section of the site and were noted to comprise soils and stripped vegetation/ organic matter. The locations of these stockpiles are presented on Figure 2, Appendix A, identified as SP1 – SP4. Based on anecdotal information provided to Geosyntec by the client, the four stockpiles were derived from excavations for the construction of the residential property and the accompanying driveway. The stockpiled soil materials were noted to comprise a mixture of clay and topsoil. One stockpile located southeast of the residential property was noted to comprise coarse-grained, crushed sandstone and well laminated shale gravel. This is presented as SP5 in Figure 2, Appendix A.
Odours:	No olfactory indicators of contamination were noted during the site inspection or during the intrusive investigation. A mild organic odour was encountered within in-situ soils and sediment collected from the unnamed creek.
Condition of Buildings & Roads:	A residential building and two accompanying storage sheds were observed within the northeastern portion of the site. Anecdotal information provided to Geosyntec at the time of the inspection indicated that the structures had been constructed in 2015. The structures were noted to be in good condition, consistent with the recent reported construction. A gravel driveway was present extending from the western boundary of the site from Boureong Drive towards the residential building located in the northeastern portion of the site. An asphalt driveway (approximately 20m long) extends from Ryan Place (to the north of the site) into the site and was noted to be in good condition.
Quality of Surface Water:	An unnamed creek was present within the southeastern portion of the site, flowing from northeast to southwest. The creek is noted to be approximately 220m long and range from 5 to 8m wide. Water level within the creek was noted to be <150mm with minimal flow. Surface water contained within the creek was noted to be relatively clear, slightly turbid with an organic sheen. No olfactory indicators of contamination were observed with regard to the surface water.
Flood Potential:	The site is not mapped for Flood Potential in the Upper Lachlan Council Local Environmental Plan (2010). A Lyall & Associates The Village of Gunning Flood Study report (2019) is published on the NSW Flood Data Portal, flood studies available for the Meadow Creek in the Gunning Locality. The site contains a tributary of the Meadow Creek and the site and surrounding areas are located within 300 m of the Meadow Creek. Given that Meadow creek is located at a topographic elevation of approximately 20mAHD less than the site, potential flood risk is considered to be low.
Relevant Local Sensitive Environments:	Based on the site observations and a review of record of locally sensitive environments the following were noted within and in the proximity of the site: • Unnamed creek located within the southeastern portion of the site. • Meadow Creek located 240m to the west of the site. It also contains high potential groundwater dependent and inflow dependent ecosystems. • Onsite unclassified native vegetation. • Grassy Woodlands- Southern Tableland Grassy Box Woodlands located within a 300m radius of the site and Goulburn Tableland Box-Gum Grassy Forest within 130m south of the site.

Title	Details
	• Forested Wetlands – Southwest Tableland Gorges Riparian Shrubland located approximately 400m to the southwest of the site. • Residential properties located within neighbouring lots, particularly downgradient south to southwest. • Public parks to the southwest within 500m of the site. • Public swimming pool facility, Gunning Swimming Pool, located 485m to the southwest of the site

2.4 Surrounding Land Use and Zoning

Land uses immediately adjoining the Site are described as follows:

Table 2.3: Immediate Site Surrounds.

Title	Details
North:	Ryan Place, followed by undeveloped rural land.
East:	A residential property, followed by undeveloped rural land with Old Hume Highway further.
South:	Rural residential properties, Yass Street and part of vacant land.
West:	Boureong Drive, followed by rural residential properties, part of a sewage treatment plant (Gunning Sewage Treatment Plant), Meadow Creek and a railway track. Another area 100m to the northwest also appears to be a treatment plant. A Mobil Service Station was located approximately 600m southwest of the site.

3 Site History

The site information and history were sourced from historical aerial photographs, NSW EPA Public Register/Databases, and other publicly available information from online searches and in the Lotsearch Report. The Lotsearch report is provided in Appendix C.

Table 3.1: Summary of Site History.

Title	Details
Summary of Previous Land Use & Chronological List	Reviewed site history indicates that the site was largely part of undeveloped rural land prior to 2015. When, based on anecdotal information a residential property was constructed at the site. Aerial imagery indicates the presence of an unnamed creek within the southeastern portion of the site, present from prior to the 1950s. Areas of urban and residential development, progressively occurred within the surrounding vicinity, particularly to the south and southwest of the site, from prior to the 1950s to the 2020s. The Gunning Sewage Treatment Plant to the southwest of the site appears to have been developed in the 1980s. The surrounding roads were progressively developed and paved from the 1990s. A large detention basin and associated buildings and structures were developed to the northwest of the site sometime after 2012.
EPA Contaminated Land Records	The site is not listed on the NSW EPA contaminated land register; however, one property 'Gunning Motors' located at 56 Yass Street, Gunning, a Mobil Service Station was listed on the NSW EPA contaminated land register, with the stated management class of 'Regulation under CLM Act not required.' The property is located approximately 600m to the southwest and downgradient of the site and therefore is not considered to be a potential offsite contamination source. The proximity of the site to the identified property is presented within the Lotsearch report included within Appendix C.
POEO Licence Records, Permits and Approvals:	Based on a review of the NSW EPA Register under the Protection of the Environment Operations (POEO) Act 1997 (NSW), there are no current licenses for the site. Two current licenses are listed for properties located within a 500m radius of the site: • Environment Protection License (EPL) 3110 issued to Upper Lachlan Shire Council for '*Sewage treatment processing by small plants'* for Gunning Sewage Treatment Plant, located approximate 160m southwest of the site. • EPL3142 issued to the Australian Rail Track Corporation Limited for *'Railway systems activities',* located approximately 370m west of the site. The above properties are either down hydraulic gradient or not in sufficient proximity of the site to be considered a potential offsite source of contamination. Historical licensed activities for herbicides application had occurred in the waterway on the site (within the creek) and in the surrounds. No other current or historic registrations for permits, licences, or the requirement for approvals for site activities were noted.
Clean Up, Penalty Notices and Orders:	A review of the NSW EPA public register under the POEO Act 1997 (NSW), did not indicate EPA notices pertaining to the site. However, the following notice for the property immediately south of the site was noted: • Clean Up Notice 1592697, issued to Upper Lachlan Shire Council on 10 March 2020, pursuant to Section 91 '*Çlean-up by occupiers or polluters'* of the POEO Act 1997 (NSW). The cleanup notice was related to a sewer overflow incident from a manhole located at Lot 181 DP754118 (approximately 158m southwest of the site) resulting in an estimated 20,000-30,000L of untreated sewer effluent discharge to Meadow Creek. • Penalty Notice 3085767630, issued to Pacific National (NSW) Pty Ltd, on 4 February 2013, pursuant to Section 120 (1) *'Prohibition of pollution of waters'* for land located along the rail corridor between Bango, Goulburn and Moss Vale, Goulburn, NSW, 2580.
Historical Title Search:	A historical title search was not conducted as part of this investigation. Anecdotal information obtained by Geosyntec during the site interview indicated that the certificate of title for the site had been held by the current site owner since 2015. Based in the site history assessment, historic title records are not considered a material data gap.
SafeWork NSW Dangerous Goods Licences/ USTs/ ASTs:	A SafeWork NSW Dangerous Goods search was not conducted as part of this investigation. At the time of the inspection no evidence of underground storage tanks

Title	Details
	(UST's) or storage of hydrocarbon fuels was observed within the site. Based on the site history assessment, a search of SafeWork NSW Dangerous Goods Licences is not considered a material data gap An above-ground 100,000L rainwater tank was observed adjacent to the northeastern boundary of the site (refer to photo 7 in Appendix D).
Summary of Aerial Photographs (both on- and offsite)	Current and historic aerial photographs were reviewed to identify major land use changes both on and adjacent to the site. The findings from the review of the aerial photographs of the site are summarised as follows: • **1950:** The site appears to be part of rural undeveloped land. A creek is located the southeastern section of the site. An unsealed road/track appears to encroach the western boundary of the site. Yass Street and Cullerin Road appear parallel to the southeastern boundary of the site. Immediately surrounding properties appear to be rural undeveloped land, with some rural residential properties noted to the southwest. • **1973:** The site remains as part of rural undeveloped land. The unsealed road formerly identified encroaching the western boundary of the site appears to have been subject to realignment, now running parallel to the western boundary of the site. Immediately surrounding areas remain relatively unchanged, noting that residential development appears to have increased further south and southeast of the site. • **1983:** The site remains as part of rural undeveloped land. Development appears to have increased south and southwest of the site. Multiple constructed surface water bodies and associated structures appear present further southwest of the site and potentially is the development of the Gunning Sewage Treatment Plant. • **1989:** The site and the immediate surrounding areas remain relatively unchanged. • **1997:** The site remains as part of rural undeveloped land. A residential property appears to have been constructed immediately south of the site. A property further southwest appears to be subject to earthworks likely associated with the increased urban and the sewage treatment plant development. The roads appear to be predominantly paved now. • **2003:** The site and its immediate surrounds appear relatively unchanged, with the minor exception of additional residential properties which have been constructed south of the site. • **2012:** The site appears relatively unchanged. Areas of residential development appear to have increased further south and southwest of the site. • **2023:** Three structures (a residential dwelling and sheds/outbuildings based on site walkover assessment) have been constructed within the northeastern portion of the site. The northeastern portion of the site appears to have been subject to minor earthworks, likely associated with the construction of the residential property. An unsealed driveway extends from the western boundary of the site towards the residential property. A sealed driveway provides access from the northern boundary of the site located along Ryan Place. A water tank appears to have been erected, further southeast of the residential buildings. An internal fence line has been constructed establishing a delineation between the residential property and the remainder of the site. The surrounding areas appear to have been further developed with rural residential properties now present to the immediate east, to the northeast, north and west of the site. The residential area to the south and southwest of the site appears to have been further developed. Asphalt paved roadways are developed to the immediate north, west and northwest of the site. Additional small dams are visible to the east and northeast of the site. A large detention basin and associated buildings and structures were developed to the northwest of the site.
Description of Manufacturing / Industrial Processes and Location	No manufacturing activities appear to have been conducted at the site. Based on the review of the historical aerial imagery, industrial processes are not likely to have occurred on site. The site is unlikely to have been historically subject to intensive agricultural processes or livestock housing.

Title	Details
Product Spill and Loss History:	No documentation was reviewed regarding spills or product loss. No evidence of spills was observed during the site walkover. No bulk chemical storage was observed onsite.
Discharges to Land, Air & Water:	No documentation regarding discharge to land, air and water was reviewed. None was observed during the site walkover as well.
Complaint History:	No documentation regarding a complaint history was available for review.
Sewer and Service Plans:	No documentation pertaining to current sewer and service plans were reviewed as part of this assessment.
Local Literature Review:	Not undertaken as part of this assessment.

4 Geology, Hydrogeology and Hydrology

The geology, hydrogeology and hydrology of the site are summarised in this section. This information has been sourced from the Geological and Soil Landscape sheets, and the NSW Natural Resource Atlas for groundwater bores registered in the vicinity of the site.

Table 4.1: Subsurface Conditions.

Title	Details
Geology Map Conditions:	The Department of Regional NSW, Statewide Seamless Geology *v2.1*, indicates that the site is underlain by both Colluvium deposits and Gunning Granite. Each unit is characterised as follows: • Colluvium: poorly sorted, weakly cemented to unconsolidated colluvial lenses of polymictic conglomerate with medium to very coarse-grained sand matrix, interspersed with unconsolidated clayey and silty red-brown (aeolian) sand layers, modified by pedogenesis. • Gunning Granite: Grey to cream, medium to coarse-grained, equigranular to porphyritic hornblende-biotite granite, granodiorite and lesser tonalite; dark grey ovoid microdioritic enclaves and clots; granite is strongly schistose along the eastern margin.
Soil Map Conditions:	The site is underlain by Sodosols which are typically characterised as follows: • Undulating to hilly country; chief soils are hard neutral and acid yellow mottled soils associated with hard acidic and neutral red soils and some siliceous sands on colluvial deposits, in a general undulating to hilly slopes of various soils pattern. The site comprises Garland and Wyangala soil landscapes.
Acid Sulfate Soils:	The site is situated within a ‘‘Class 5’’ zone according to the Atlas of Australian Acid Sulfate Soils and is considered a ‘Low Probability of occurrence’’ with regards to acid sulfate soil risk. Acid sulfate soils are not typically found in Class 5 areas. Areas classified as Class 5 are located within 500 metres on adjacent class 1,2,3 or 4 land. An additional review of the NSW Department of Planning Industry and Environment tool eSpade v2.2 highlighted that the source site is not situated within mapped terrain regarding acid sulfate soil risk. As such, sub-surface soils within the site are considered to present a low risk of containing acid sulfate soils.
Salinity:	According to the National Land and Water Resources Audit- Dryland Salinity- National Assessment, the site is not located within an area mapped for salinity risk.
Ground Conditions Summary:	Ground conditions encountered during the intrusive investigation were typically characterised as follows. • Topsoil: Sandy SILT; low plasticity, brown, fine-grained sand, soft. • Topsoil: Sandy SILT: medium plasticity, brown, fine-grained sand, trace fine-grained igneous gravel, trace clay, soft; moist. Topsoil was underlain by natural clay soils identified within one borehole (BH102) in the northeastern section of the site, and typically characterised as follows: • CLAY: medium plasticity, brown orange mottled, trace organic fibres, firm; moist. Encountered soil profiles are presented within borehole logs appended in Appendix E.
Location of Fill Materials:	A total of five stockpiles were identified within the site and were located within the northeastern portion of the site. Anecdotal evidence provided to Geosyntec at the time of the inspection indicated that four of the stockpiles comprised soils excavated from the site associated with the residential development in 2015 (natural topsoil/stripped vegetation/ clay soils), and the construction of the driveway. One other stockpile comprised imported shale gravel used for the driveway construction at the site.
Regional Hydrology and Hydrogeology:	Regional groundwater is expected to follow the topography of the land, flowing south to southwest. The site is situated atop fractured or fissured, extensive aquifers of low to moderate productivity.
Summary of Monitoring Wells:	No groundwater wells were identified on the site.

Title	Details
	Review of the Water NSW registered groundwater bores as stated in the Lotsearch report identified one (1) groundwater bore within a 500m radius of the site. The identified well is currently abandoned and was extended to a depth of 64.0m and historically utilised for monitoring purposes.
Depth to Groundwater:	Standing Water Levels (SWLs) were not recorded for the well located within a 500m radius of the site. Three wells located within 1100m radius of the site to the southwest, reported SWLs ranging from 5.75m to 7.56m below ground level (mbgl).
Use of Water Abstraction:	Water abstraction was not observed on site; however, groundwater abstraction for the purposes of water supply was noted within one property located approximately 952m south of the site: • GW058346: drilled for water supply purposes to a depth of 43.60m bgl. And for other purposes was noted within one property located approximately 860m southwest of the site: • GW015930: drilled for other purposes to a depth of 30.5m bgl.
Groundwater Flow	Groundwater is anticipated to follow the topography of the site, flowing south to southwest and discharging towards either to the onsite creek line or Meadow Creek, located approximately 250m from the western boundary of the site.
Nearest Water Body:	An unnamed creek is located within the southeastern portion of the site, a tributary of Meadow Creek located to the west of the site. During the site inspection the creek was observed to flow from northeast to southwest (entering the site at the eastern site boundary and exiting the site at the southern site boundary), spanning a length of approximately 220m.
Direction of Surface Water Run Off:	Surface water is expected to infiltrate directly through the unsealed surface vegetation and soils. Excess runoff is expected to flow south to southeast into the unnamed creek or follow the site topography and flow south towards neighbouring properties and roadway.
Background Water Quality:	Background water quality was not reviewed as part of the assessment.
Preferential Water Courses:	Water flows towards the southwest in the unnamed creek in the southeastern section of the site.
Summary of Local Meteorology (Rainfall data: Dalton Post Office (Station ID:70112) (Temperature Data: Goulburn Tafe (Station ID:70263)	Mean annual rainfall: 607.7mm (dataset period 1898-2024) Mean annual maximum temperature: 19.7°C (dataset period 1971-2024) Mean annual minimum temperature: 7.7°C (dataset period 1971-2024)

5 Data Quality Objectives

The data quality objectives (DQO) process is a systematic planning tool based on the scientific method for establishing criteria for data quality and for developing data collection designs. The DQO defines the experimental process required to test a hypothesis. By using the DQO process to plan the investigation and validation effort, the relevant parties can improve the effectiveness, efficiency and defensibility of a decision in a resource and cost-effective manner.

The DQO process consists of seven steps, which are designed to clarify the study objectives, define the appropriate type of data and specify tolerable levels of potential decision errors. The seven-step DQO process adopted for the works was as follows:

- Step 1 – Defining the Problem. The first step in the DQO process is to 'define the problem' that has initiated the investigation;
- Step 2 – Identify the Decision. The second step in the process is to define the decision statement that the study will attempt to resolve;
- Step 3 – Identify Inputs to the Decision. In this step, the different types of information needed to resolve the decision statement are identified;
- Step 4 – Define the Study Boundaries;
- Step 5 – Develop a Decision Rule;
- Step 6 – Specify Limits on Decision Errors; and
- Step 7 – Optimise the Design for obtaining the Data.

These Steps have been followed for the validation works, with DQO summarised in Table 5.1 and DQIs.

Table 5.1: Data Quality Objectives

1. State the problem	A planning proposal is proposed to amend the Upper Lachlan Local Environmental Plan (LEP 2010 to rezone the site from RU4 Primary Production Small Lot to RU5 Village, followed by subsequent subdivision of the site to form residential lots. A letter from the NSW EPA to Ms Ann Martin of Department of Planning, Housing and Infrastructure (Referenced Gunning Heights Estate- PP-2024-121, dated 23 May 2024) issued to client, requiring that a contamination assessment in accordance with the Statement Environment Planning Policy (Resilience and Hazards) 2021, Chapter 4-Remediation of Land be completed to allow assessment of the planning proposal.
2. Identify the decision	Have potentially contaminating activities been historically conducted within the site, or within proximity to the site? Do chemical concentrations in sub-surface soils and creek sediment pose a risk to human health and ecological receptors via direct exposure or leaching to groundwater? Do chemical concentrations in surface water pose a risk to human health and ecological receptors? Is the site suitable for the proposed land use?
3. Identify inputs to the decision	**List of Informational Inputs Needed to Resolve the Decision Statement** Inputs in the decision are: • Historical aerial imagery. • Physical observations and photographs from the site inspection. • Subsurface soil, sediment, surface water sampling and laboratory results. • Site Interview. **Identification of Site Criteria for Each Medium of Concern** The site assessment criterion to be adopted is the NEPC (1999) National Environment Protection (Assessment of Site Contamination) Measure Schedules B(1)-B(2) as amended in April 2013 (NEPM (2013))

	• Health Investigation Level (HIL) A for Low-Density Residential use from Table 1A(1) of Schedule B1. • Generic Ecological Investigation Level (EIL) for Urban residential and public open space Table1B(5) of Schedule B1. • Site-Specific Ecological Investigation Level for Urban residential and public open space for Copper, Nickel, Chromium and Zinc. • Ecological Screening Levels (ESL) for Urban Residential and Public Open Space. **Identification of Analytical Methods that are required for Chemicals of Potential Concern so that Assessment can be made Relative to the Site Criteria** The analytical methods of the National Association of Testing Authorities (NATA) accredited primary laboratory Envirolab are provided in Table I-1, Appendix I.
4. Define the boundaries of the study	The spatial boundaries of the site are presented on Figure 2, Appendix A. The vertical boundary of the site was proposed to extend to 0.3m below ground level.
5. Develop a decision rule	Do chemical concentrations in soil, sediment and surface water pose a risk to human health or ecological receptors/ receiving environment. The following criteria will be adopted with respect to the decision-making process: • If contaminants of concern are less than the adopted site criteria then the decision is no, then no further action may be required. • If the contaminants of concern exceed the adopted criteria, then the decision is yes and further assessment and/or remediation and/or management will be required.
6. Acceptable limits on decision error	There are two main sources of false results which may cause decision errors: • Sampling errors, which occur when the samples collected are not representative of the conditions within the investigation area; and • Measurement errors, which occur during sample collection, handling, preparation, analysis and data reduction. The pre-determined data quality indicators (DQIs) are discussed in Appendix F, and relate to precision, accuracy, representativeness, comparability and completeness (PARCC parameters) as required by Step 6 of the DQO process.
7. Optimise the design for obtaining data	Based on the previous Step 1 to 6 of the DQO process, the optimal design for obtaining the required data is presented in Section 6 and 7.

6 Sampling Analysis and Quality Plan

6.1 Sampling and Analysis Plan

Table 5.1: Soil Sampling Methodology.

Title	Details
Sample density and pattern	A total of six (6) sampling locations were selected based on a targeted sampling pattern for the purpose of providing a preliminary assessment of the site. Sample locations targeted areas of proposed residential land use. Six sample locations provides a sample density of approximately 0.6 samples per hectare.
Drilling	The site inspection and intrusive investigation was conducted on 8 August 2024. Six (6) boreholes (BH101 – BH106) were advanced across the site via a decontaminated powered hand-auger to a maximum depth of 0.3m below ground level (m bgl).
Soil Sampling	Soil sampling was completed by a qualified and experienced Geosyntec environmental scientist, in general accordance with the NEPM (2013) guidelines. Soil samples were collected directly from the auger flights, with suitable care taken to collect soil that had not encountered direct contact with the auger stem. Dedicated nitrile gloves were used at each sampling location, to prevent potential cross contamination. Approximate borehole locations are outlined in Figure 2 in Appendix A, based on measurement from salient onsite features. The hand-auger was subjected to a three-stage decontamination process involving de-ionised water and Liquinox® between the sampling locations. Samples were generally collected from the following depths at each borehole: 0.0-0.1m, 0.1-0.2 and 0.2-0.3m.
PID Screening	Soil samples were field-screened for volatile organic compounds (VOCs) using a calibrated photoionisation detector (PID) provided by Air-Met Scientific (calibration certificates are provided in Appendix I). PID readings and visual/olfactory indicators of contamination were used to aid in sample selection and scheduling samples for chemical analysis. The following is a summary of the PID screening procedure and the results: • Placement of a split soil sample into a sealed zip-locked plastic bag. The collected sample was agitated and allowed to rest for a period of approximately 15 minutes to facilitate the accumulation of potential VOCs within the ambient space in the zip-lock bag. • Measurement of background VOC concentrations in ambient air prior to each reading to account for sensor drift; and • Using the point of the PID, a small hole was pierced into the bag. The tip of the PID was placed into the bag, the reading monitored, and the maximum concentration noted during the recording period.
Sediment Sampling	Sediment samples were co-located with the surface water samples and collected from the base of the unnamed creek via grab-sampling using dedicated nitrile gloves and subsequently placed into laboratory supplied sampling jars.
Surface Water Sampling	Surface water samples were collected from the unnamed creek located within the southeastern portion of the site. Sample collection was targeted at the entrance (eastern site boundary) and exit (southern site boundary) points of the creek (or within proximity) within the site to assess potential onsite and offsite contaminant migration. Surface water samples were collected via grab-sampling, with samples collected directly from the midpoint of the creek flow directly into laboratory prepared sampling bottles suitable for analysis for the chemical analytes stipulated within Table 5.3. Samples for metals analysis were not field filtered. Following sample collection water quality parameters were recorded using a calibrated YSI water quality probe, noting the following physiochemical parameters: potential of hydrogen (pH), redox potential (Eh), electrical conductivity (EC), dissolved oxygen (DO), and temperature. Surface water sampling locations are presented within Appendix A, Figure 2.
Field QA/QC Sampling	Given the preliminary nature of the investigation and the small dataset, the collection of intra-laboratory and inter-laboratory duplicate samples was not considered warranted and was not undertaken.
Soil Logging	Soil logging was completed by a qualified and experienced Geosyntec scientist in general accordance with the Australian Standard (AS) 1726: Geotechnical Site Investigations. Evidence of anthropogenic inclusions or evidence of potential

Title	Details
	contamination (odours, staining) were recorded in the borehole logs presented in Appendix E.
Sample Handling and Transportation	Sample collection, storage and transportation was completed in general accordance with NEPM (2013) guidelines. Soil, sediment and water samples were placed into laboratory supplied sample jars with Teflon lids or appropriate bottles, labelled with a unique sample ID and placed into an ice-cooled insulated container. Asbestos analysis soil samples were placed into zip-lock plastic bags, double bagged and labelled with a unique sample ID. Borehole samples were given a sample ID. Samples were transported to a NATA accredited laboratory (Envirolab) under chain of custody (COC) conditions. Laboratory documentation is provided in Appendix G.

6.2 Analytical Schedule

Soil, sediment and water samples analysis was conducted by Envirolab Services. The laboratory is NATA accredited for the analytes assessed.

A total of six (6) soil samples, two (2) surface water, and two (2) sediment samples were submitted for analysis.

Table 5.2: Soil and Sediment Chemical Analytes.

Chemical of Concern	No. of Samples
8 Heavy Metals and Metalloids (arsenic, cadmium, chromium, copper, mercury, lead, zinc)	8
Organochlorine Pesticides (OCP)	8
Benzene, Toluene, Ethylbenzene, Xylene, Naphthalene (BTEXN)	8
Polycyclic Aromatic Hydrocarbons (PAHs)	8
Total Recoverable Hydrocarbons (TRHs)	8
Asbestos (500ml)	6

Table 5.3: Surface Water Chemical Analytes.

Chemical of Concern	No. of Samples
8 Heavy Metals and Metalloids (arsenic, cadmium, chromium, copper, mercury, lead, zinc). Total metals analysed. Samples were not field filtered.	2
Organochlorine Pesticides (OCP)	2
Benzene, Toluene, Ethylbenzene, Xylene, Naphthalene (BTEXN)	2
Polycyclic Aromatic Hydrocarbons (PAHs)	2
Total Recoverable Hydrocarbons (TRHs)	2
Nutrients (phosphate, nitrate, nitrite, and ammonia)	2

6.3 Quality Assurance (QA) and Quality Control (QC) Sampling

Given the limited sampling regime and the preliminary nature of the investigation, the collection of soil/sediment/water duplicate (intra-laboratory) and triplicate (inter-laboratory) samples was not conducted.

7 Site Assessment Criteria

As the proposed subdivision will include areas of residential use, a public reserve, new roadway and a riparian buffer zone, assessment criteria for low density residential land use were adopted to reflect the most sensitive land use.

7.1 Assessment Criteria for Soil

Soil analytical results were assessed against the guidelines listed below, with the adopted soil criteria summarised in Table 1, Appendix H- Results Summary Tables:

- National Environment Protection Measure (NEPM) (2013) Health Investigation Levels: HIL-A Low-Density Residential use from Table 1A(1).
- NEPM (2013) Health Screening Levels: HSL A Low-Density Residential use for clay soil (0 – 1 m) taken from Table 1A(3). The HSLs apply to vapour intrusion for TRH (F1 and F2 Fractions), BTEX, and naphthalene.
- NEPM (2013) Generic Ecological Investigation Levels (EIL): Urban Residential and Public Open Space use from Table 1B(6).
    - Where required, soil physiochemical parameters were sourced from the NSW Department of Planning Industry and Environment eSpadev2.2 'modelled soil properties.' A conservative cation exchange capacity of 10cmoc/kg, soil pH of 4.5 and clay content of 15% were used as input values for EIL calculations.
    - Table 6.1 below presents the Ambient Background Concentration (ABC) and Added Contaminant Limits (ACL) adopted and calculations for each EIL or adopted generic EILs for urban residential and open public spaces (URPOS) land use.

Table 6.1: EIL Calculations and Generic EILs

Analyte	ABC	ACL Calculation Characteristics	Generic EILs	Site Specific EILs
Arsenic	Aged Soils of NSW Low Traffic Volume	-	100	-
Naphthalene	Aged Soils of NSW Low Traffic Volume	-	170	-
Lead	Aged Soils of NSW Low Traffic Volume	-	1100	-
Copper	Aged Soils of NSW Low Traffic Volume	pH – 4.5 CEC – 10cmoc/kg	-	75
Nickel	Aged Soils of NSW Low Traffic Volume	CEC -10cmoc/kg	-	170
Chromium III	Aged Soils of NSW Low Traffic Volume	Clay content - 15 % (w/w)	-	460
Zinc	Aged Soils of NSW Low Traffic Volume	pH – 4.5 CEC – 10cmoc/kg	-	200
DDT	Aged Soils of NSW Low Traffic Volume	-	180	-

7.2 Aesthetics assessment

NEPM 2013 requires consideration and assessment of the aesthetic quality of sub-surface soils during intrusive investigations and suitability assessments. Whilst there are no quantifiable

guidelines for determining if soils are appropriately aesthetic, professional judgement on the presence and extent of foreign materials and/or visual indicators of contamination (i.e. staining, odours) are considered applicable in assessing aesthetic quality. Site observations detailing the presence of foreign materials and/or other comments pertaining to sub-surface soil aesthetics are documented in the bore logs in Appendix E.

7.3 Assessment Criteria for Sediment

- Australian and New Zealand Guidelines (ANZG) (2023) Toxicant Default Guidance Value for Sediment Quality.

7.4 Assessment Criteria for Surface Water

The unnamed creek line present within the southern portion of the site was identified as a tributary to the Lachlan River Catchment. The NSW Office of Environment and Heritage Water provides the following water quality objectives for uncontrolled streams within the Lachlan River Catchment.

Protection of:

- Aquatic Ecosystems.
- Visual Amenity.
- Secondary contact recreation
- Primary Contact recreation.
- Livestock water supply.
- Irrigation water supply.
- Homestead water supply.
- Drinking water at point of supply- Disinfection only.
- Drinking water at point of supply- Clarification and disinfection.
- Aquatic Foods (Cooked)

Primary and secondary contact from recreational activities are considered unlikely given the nature of the creek line (high presence of vegetation) and the minor quantity of surface water present. Based on the review of site history, and anecdotal information obtained from the site interviewee, the site has not historically been subject to intensive agricultural use, warranting livestock water supply or irrigation water supply. Considering the site is proposed for residential subdivision, use of the onsite creek line for water supply (for livestock, irrigation, drinking water purposes) is not considered likely.

As such, the following surface water criteria has been adopted for the protection of potential aquatic ecosystems:

- ANZG (2023), Freshwater Toxicant Default Guidance Value for 95% protection level for slightly to moderately disturbed ecosystems.

8 Field Observations and Laboratory Results

8.1 Field Observations

The key observations made during the fieldwork can be summarised as follows:

- During the site inspection and sampling works, the site was observed to possess a steep fall from north to southwest.
- The site comprised grass coverage, exposed soil surfaces, a gravel covered entrance driveway (extending from Boureong Drive at the western site boundary to the residential property in the northeastern section of the site) and asphalt driveway providing access from Ryan Place along the northern boundary of the site.
- The site was bound by a barbed wire picketed fence noted to be in good condition with only minor damage noted along the southern portion of the site.
- No potentially asbestos containing materials (PACM) were identified on the site surfaces during the site inspection or within the six boreholes advanced and the two stream sediment samples collected.
- No visual or olfactory indicators of contamination were observed during the site walkover or during the sampling event. A mild organic odour was encountered within the in-situ soils and sediment samples collected.
- Five partially vegetated stockpiles (each less than 25m^3) were observed within the northeastern portion of the site. The stockpiles were noted to comprise soils generated from excavation works associated with the construction of the gravel driveway and the residential property and imported gravel for the construction of the driveway.
- A 100,000L rainwater tank and attached centrifugal pump system was observed approximately 40m southeast of the residential property.
- Structures onsite comprised a residential property, and two storage sheds located within the northeastern portion of the site. Information obtained during the site interview indicated that the residential property and storage sheds were constructed in 2015. A timber chicken coop was located within the central northern portion of the site.
- Both storage sheds were noted to house motor vehicles, general household appliances and cleaning products. No evidence of fuel or bulk chemical storage was noted.
- A shallow creek was observed flowing from northeast to southwest within the southeastern portion of the site. Vegetation was present along the riparian zone parallel to the creek and within the creek itself. A slight organic sheen was observed atop surface water contained within the creek.

8.2 Encountered Stratigraphy

The site stratigraphy comprised a topsoil profile typically characterised as Sandy SILT, fine grained, brown to dark brown, with organic fibres and rootlets, and trace fine-grained sub-rounded, igneous gravel, encountered within the six boreholes advanced across the site. Topsoil was typically underlain by CLAY, medium plasticity, brown, orange mottle, trace organic fibres (identified within BH102 in the northeastern section of the site).

Sediment encountered within the unnamed creek line were typically characterised as Clayey SILT: medium plasticity, brown to dark brown, with strong organic odour.

8.3 Field Screening – PID

PID readings were collected for each sample with screening results ranging from 0.6ppm to 3.0ppm. Individual PID results are presented within the Borehole Logs in Appendix E.

8.4 Soil Analytical Results

Laboratory results in comparison to the site assessment criteria are presented in Table 1, Appendix H, and laboratory documentation is provided in Appendix G.

Soil analytical results reported concentrations of chemical contaminants of concern below the adopted site assessment criteria for human health and ecological receptors.

8.5 Sediment Chemical Results

Concentrations of contaminants of potential concern (as presented within Section 5.2) were recorded below the ANZG (2023) Toxicant Default Guidance Value for Sediment Quality, within both the sediment samples collected from the eastern entry point of the site (SED1) and the southern exit point (SED2).

8.6 Surface Water Physiochemical Results

Table 8.1 Field Physiochemical Parameters

Location ID	pH	Temp (ºC)	EC (µS/cm)	DO (ppm)	ORP (mV)	Observations
SW1E	7.04	5.20	0.23	50.70	-95.70	No Odour, Organic sheen observed. No Phase Separated Hydrocarbon (PSH). Suspended solids present. Slightly turbid.
SW2W	8.09	5.90	0.47	84.1	-78.9	No Odour, Organic sheen observed. No PSH, Colourless. Very low turbidity.

8.7 Surface Water Chemical Results

Chemical concentrations were recorded below the adopted assessment criteria for the analytes within the sample SW2W. The following chemical concentrations were recorded above the adopted assessment criteria for the sample SW1E:

- Concentrations of cadmium were recorded above the 95% freshwater toxicant DGV of 0.0002mg/L, with the sample SW1E recording a maximum concentration of 0.0003mg/L.
- Concentrations of copper were recorded above the 95% freshwater toxicant DGV of 0.0014mg/L, with the sample SW1E recording a maximum concentration of 0.051mg/L.
- Concentrations of lead recorded above the 95% freshwater toxicant DGV of 0.0034mg/L, with the sample SW1E recording a maximum concentration of 0.049mg/L.
- Concentrations of nickel were recorded above the 95% freshwater toxicant DGV of 0.011mg/L, with the sample SW1E recording a maximum concentration of 0.043mg/L.
- Concentrations of zinc were recorded above the 95% freshwater toxicant DGV of 0.008mg/L, with the sample SW1E recording a maximum concentration of 0.16mg/L.

- Fraction 2 TRH (190 ug/L), Fraction 3 TRH (780 ug/L) and Fraction 4 TRH (160 ug/L) were detected in SW1E.

9 Discussion

9.1 Site History

Based on a review of historical aerial imagery obtained from the period 1950 to 2024 and information obtained as part of the general site inspection/ site interview, the site has largely existed as undeveloped rural land from 1950 to 2015, when, a residential dwelling and two outbuildings (corrugated sheds) were constructed. Areas of urban and residential development have progressively occurred within the surrounding vicinity, particularly south and south west of the site. As such, the findings of the historical review for the site indicate a low likelihood of potentially contaminating activities.

9.2 Field Observations

Based on the field observations presented within Section 8.1, potential indicators of contamination or areas of environmental concern were not identified during the site walkover.

9.3 Intrusive Soil Sampling and Analysis

Based on visual observations of the stratigraphy encountered during the intrusive investigation, and the analytical results presented in Section 8.3, the chemical results were recorded below the adopted site assessment criteria for human health and ecological receptors. No asbestos or potential asbestos containing material was identified during the site walkover or during the intrusive investigation. As such, potential risk associated with direct exposure to soil and leaching to groundwater, and uptake by ecological receptors is considered to be low.

9.4 Stockpiled Materials of Unknown Origin.

It is noted that four (4) stockpiles (SP1 – SP4 in Figure 2, Appendix A) containing soil materials (typically characterised as topsoil, stripped vegetation, natural clay soils) were observed during the site inspection. The observed soil stockpiles were not sampled as part of this investigation, however, were subject to visual assessment. The findings of the visual inspection in conjunction with anecdotal information obtained during the site interview indicate that the four stockpiles comprise soils generated from excavation from surface to approximately 0.3 m BGL (refer to photo 20, Appendix D), to facilitate construction of the driveway and residential property. Based on the site history assessment and chemical analysis completed, soils contained within the stockpiles are considered to present a low risk to human health and ecological receptors via direct exposure and leaching of contaminants to underlying groundwater.

A fifth stockpile (<5m^3) (denoted as SP5 in Figure 2, Appendix A) primarily comprising fine to coarse-grained, well laminated sandstone and shale gravel was present immediately southeast of the residential property. Anecdotal evidence obtained during the site interview indicated that material contained within the stockpile was imported to site to facilitate the construction of the driveway extending from the western boundary. Based on the nature of the material and a lack of visual and olfactory indicators of contamination (i.e. staining, odours), the stockpiled material is considered to present a low risk to human health and ecological receptors.

Should offsite disposal of the stockpiled materials be required, assessment and classification in accordance with the NSW EPA (2014) *Waste Classification Guidelines: Part 1* should be conducted.

9.5 Driveway Materials

Fill material (gravel overlay and base course for the asphalt driveway) was identified along the constructed driveway and surrounding the perimeter of the residential property, and based on observations this material is likely to comprise a quarried engineered material. Visual inspection noted an absence of visual and olfactory indicators of contamination. Based on observations, the fill material contained within the driveway and the perimeter of the residential property is considered to present a low risk to human health and ecological receptors via direct exposure or leaching to groundwater.

9.6 Surface Water Concentrations

Exceedance of the adopted screening criteria for protection of aquatic ecosystems for cadmium, copper, lead, nickel and zinc were detected in SW1E, located at the upgradient area of the unnamed creek, near the entry point of the creek to the site. In addition, TRH concentrations more than the laboratory lower limit of reporting were detected in SW1E.

With respect to the metals, samples were not field filtered, and suspended solids were noted in the collected sample. As such comparison of these results to the adopted screening criteria is likely to represent an overly conservative assessment, as only a portion of the detected metal concentrations are likely to be bioavailable.

Concentrations more than the adopted screening criteria (or limit of reporting for TRH) were not detected in the downgradient sampling point SW2W, indicating that water quality may improve as the water passes through the site.

No specific source of metals or hydrocarbons was identified upgradient of the site.

Surface water contained within the creek is not utilised for irrigation or drinking water purposes, and recreational use of the creek is unlikely. Moreover, conceptual subdivision plans indicate a proposed 10m buffer from the riparian zone. As such potential risk to human health associated with direct exposure are considered to be low. The recorded exceedances are considered to present a low risk to ecological receptors based on the observation of the health of the site vegetation and the SW2W concentrations recorded at the creek site exit point.

9.7 Conceptual Site Model

Based on the desktop review, site history review, site walkover and intrusive investigation no potentially contaminating activities, potential sources of contamination or areas of environmental concern were identified.

The site was historically undeveloped rural land, until 2015 where a residential dwelling was constructed in the northeastern corner of the site. Localised excavation and filling for construction of driveways have resulted in the importation of quarried road base aggregate and asphalt, with residual stockpiles of excavated site-won soils retained onsite. Site history assessment and sample analysis indicate a low risk of the stockpiled materials representing a contamination source.

Elevated metals in the upgradient surface water sample are considered to represent a low risk, and likely to represent natural background concentrations associated with entrained sediment in the collected sample.

10 Conclusions and Recommendations

Based on the findings of this assessment, Geosyntec concludes the following:

- Based on the reviewed historical information, the site has largely existed as undeveloped farmland until 2015 (anecdotally confirmed by the site owner), when a residential dwelling, accompanying storage sheds and water tank was construction within the northeastern portion of the site.
- No visual or olfactory indicators of contamination were observed across the site surfaces or within the six soil boreholes advanced across the site and two sediment samples collected from an unnamed creek in the southeastern section of the site.
- Four stockpiles comprising a mixture of topsoils and natural clay soils excavated from the site, and one other stockpile containing imported shale gravel was identified in the northeastern section of the site. Based on visual inspection of the material, the stockpiled materials are considered to present a low risk to human health and ecological receptors.
- Soil and sediment analytical results were below the adopted human health and ecological criteria for low-density residential land use and urban residential and public and open space use. Based on the soil and sediment analytical results potential risk to human health and ecological receptors is considered to be low.
- Surface water results collected from the eastern and southern site boundary points of the creek recorded concentrations below the adopted assessment criteria except for select heavy metal analytes (discussed in Section 8.6) detected within the sample (SW1E) collected from the eastern site entry point of the creek. Fraction 2 TRH, Fraction 3 TRH and Fraction 4 TRH were also detected in this sample. The recorded concentrations are considered representative of naturally occurring background ranges or could also be due to offsite source/s. Given that surface water contained within the creek is not utilised for drinking water or irrigation purposes and the water migrating offsite does not appear to be impacted as denoted from the analytical results of SW1W from the site exit point, the recorded exceedances are considered to present a low risk to current and future site and offsite receptors.
- Based on the findings of this assessment, historical information, the site's environmental setting, and the proposed residential subdivision no potential source pathway receptor linkages were identified.
- The site is considered suitable for the proposed subdivision. No further detailed environmental investigation is deemed warranted to support the proposed subdivision and development.

11 References

Government of Western Australia Department of Health (2009) Guidelines for the Assessment, Remediation and Management of Asbestos Contaminated Sites in Western Australia.

Lotsearch (2024) Lotsearch Enviro Professional Report, 18 Boureong Drive, Gunning, NSW, 2581 (File reference: LS059494 EP).

NEPC (1999) National Environment Protection (Assessment of Site Contamination) Measure, Schedule A and Schedules B(1)-B(9). National Environment Protection Council, Adelaide, as amended in April 2013.

NSW EPA (2014) NSW EPA Waste Classification Guidelines, Part 1: Classifying Waste.

NSW EPA (2020) Consultants Reporting on Contaminated Land - Contaminated Land Guidelines.

NSW EPA (2022) Sampling Design Guidelines Part 1- Application, Contaminated Land Guidelines.

12 Limitations

This report has been prepared by Geosyntec Consultants Pty Ltd (“Geosyntec”) for use by the Client who commissioned the works in accordance with the project brief only and has been based in part on information obtained from the Client and other parties. The findings of this report are based on the scope of work outlined in Section 1. The report has been prepared specifically for the Client for the purposes of the commission and use by any explicitly nominated third party in the agreement between Geosyntec and the Client. No warranties, express or implied, are offered to any third parties and no liability will be accepted for use or interpretation of this report by any third party (other than where specifically nominated in an agreement with the Client).

This report relates to only this project and all results, conclusions and recommendations made should be reviewed by a competent person with experience in environmental investigations, before being used for any other purpose. This report should not be reproduced without prior approval by the Client or amended in any way without prior written approval by Geosyntec.

Geosyntec’s assessment was limited strictly to identifying environmental conditions associated with the subject property area as identified in the scope of work and does not include evaluation of any other issues.

Changes to the subsurface conditions may occur subsequent to the investigations described herein, through natural processes or through the intentional or accidental addition of contaminants. The conclusions and recommendations reached in this report are based on the information obtained at the time of the investigation.

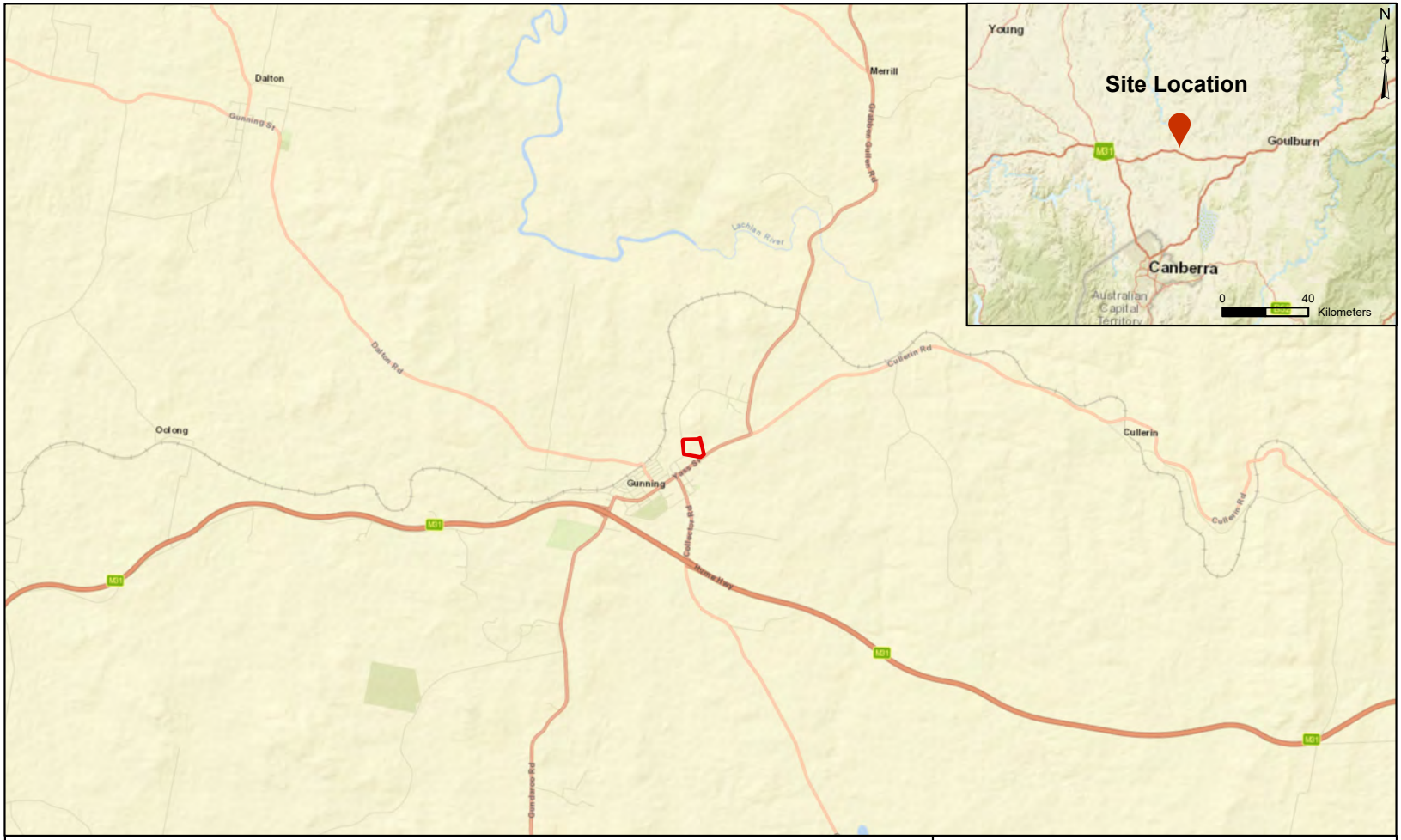
This report does not comment on any regulatory obligations based on the findings. This report relates only to the objectives stated and does not relate to any other work conducted for the Client.

The absence of any identified hazardous or toxic materials on the site should not be interpreted as a guarantee that such materials do not exist on the site.

All conclusions regarding the site are the professional opinions of the Geosyntec personnel involved with the project, subject to the qualifications made above. While normal assessments of data reliability have been made, Geosyntec has not independently verified and assumes no responsibility or liability for errors in any data obtained from regulatory agencies, statements from sources outside of Geosyntec, or developments resulting from situations outside the scope of this project.

Geosyntec is not engaged in environmental assessment and reporting for the purpose of advertising sales promoting, or endorsement of any client interests, including raising investment capital, recommending investment decisions, or other publicity purposes. The Client acknowledges that this report is for its exclusive use.

Appendix A Figures



Legend

Property Boundary

N

0 1 Kilometers

Site Location Map

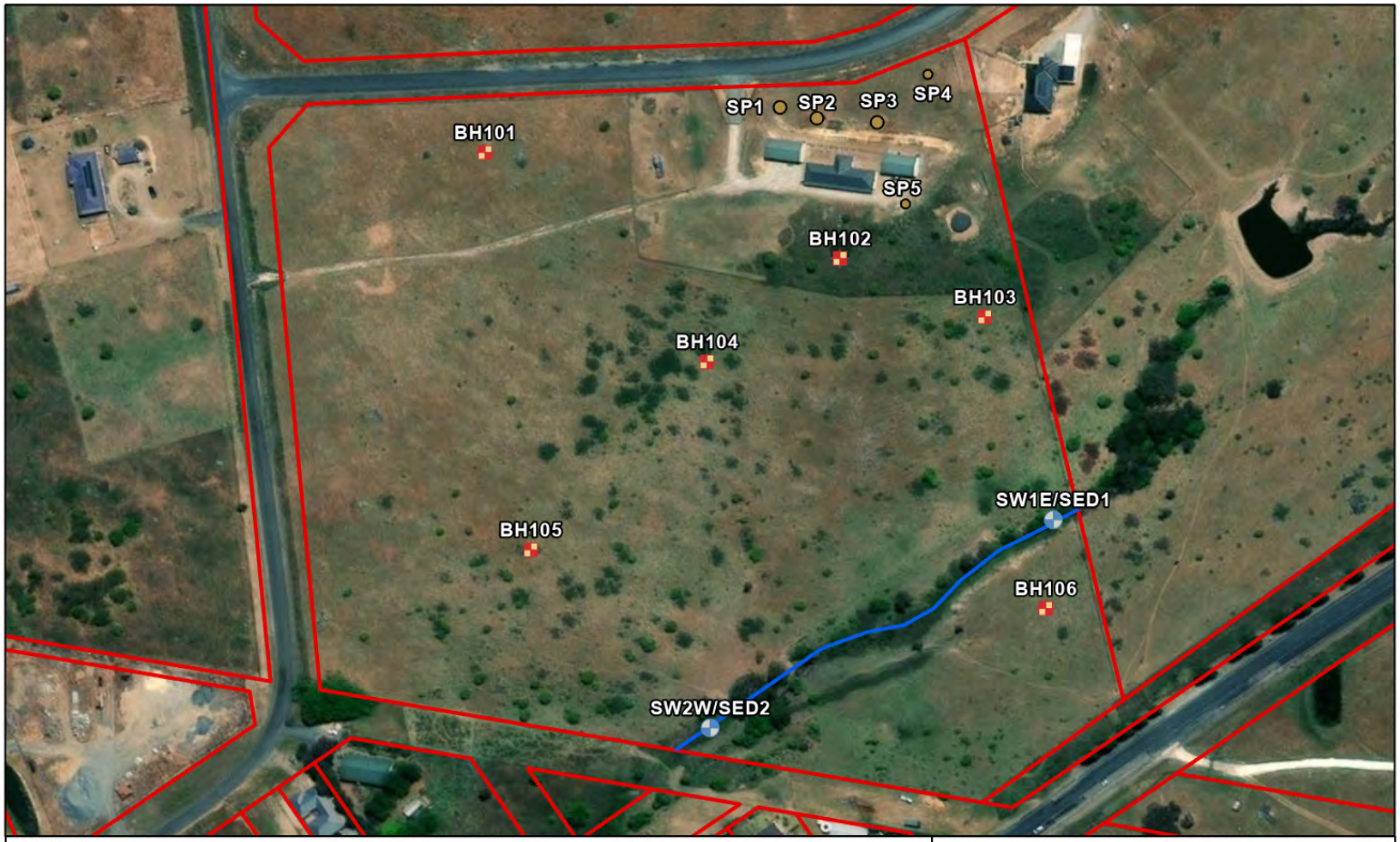
18 Boureong Drive
Gunning, NSW

Geosyntec consultants

Figure 1

AU124119 | August 2024

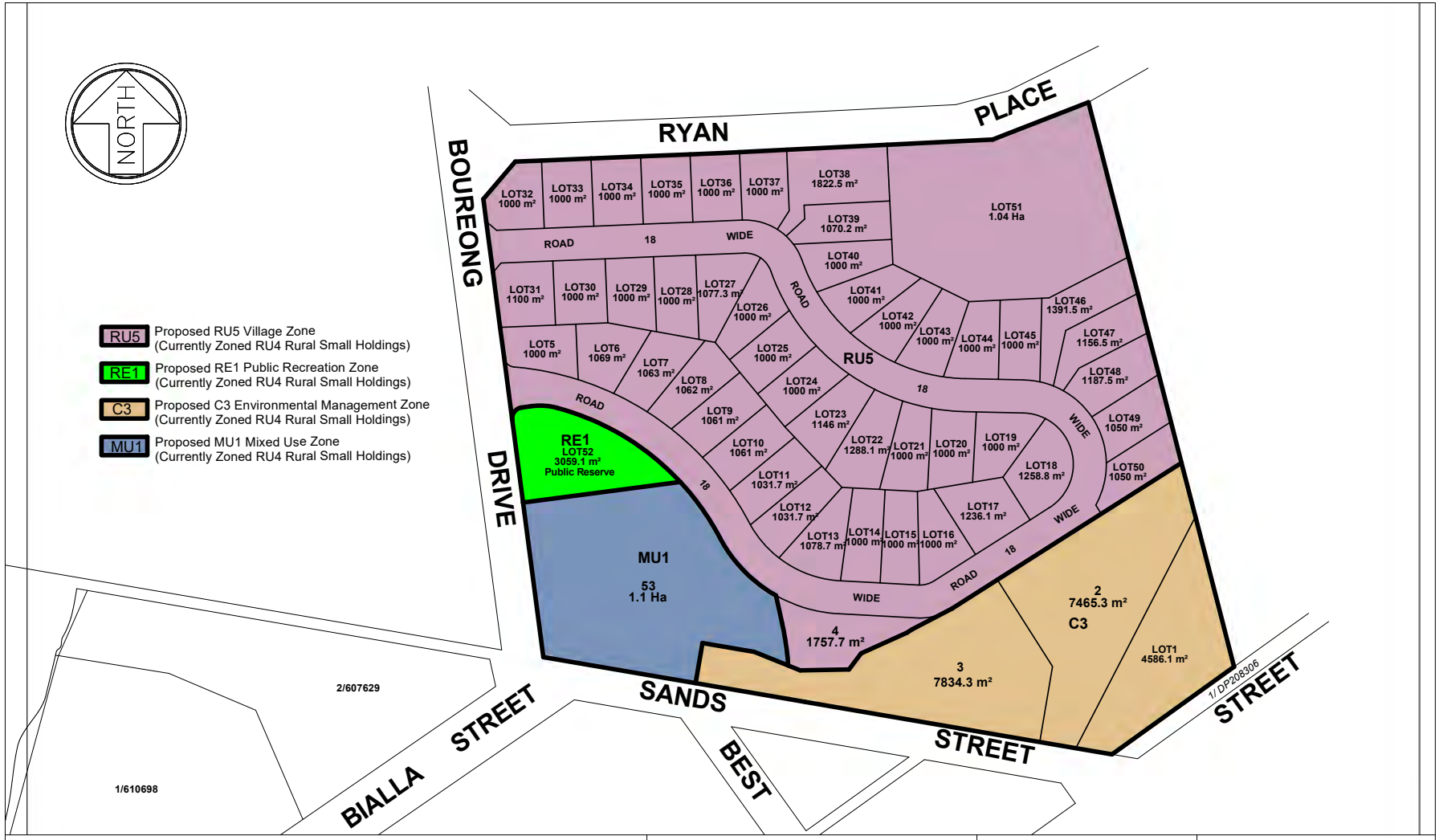
World Street Map: Vicmap, Esri, HERE, Garmin, NGA, USGS
World Street Map: Esri, HERE, Garmin, NGA, USGS



World Imagery: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

Appendix B Conceptual Subdivision Plan

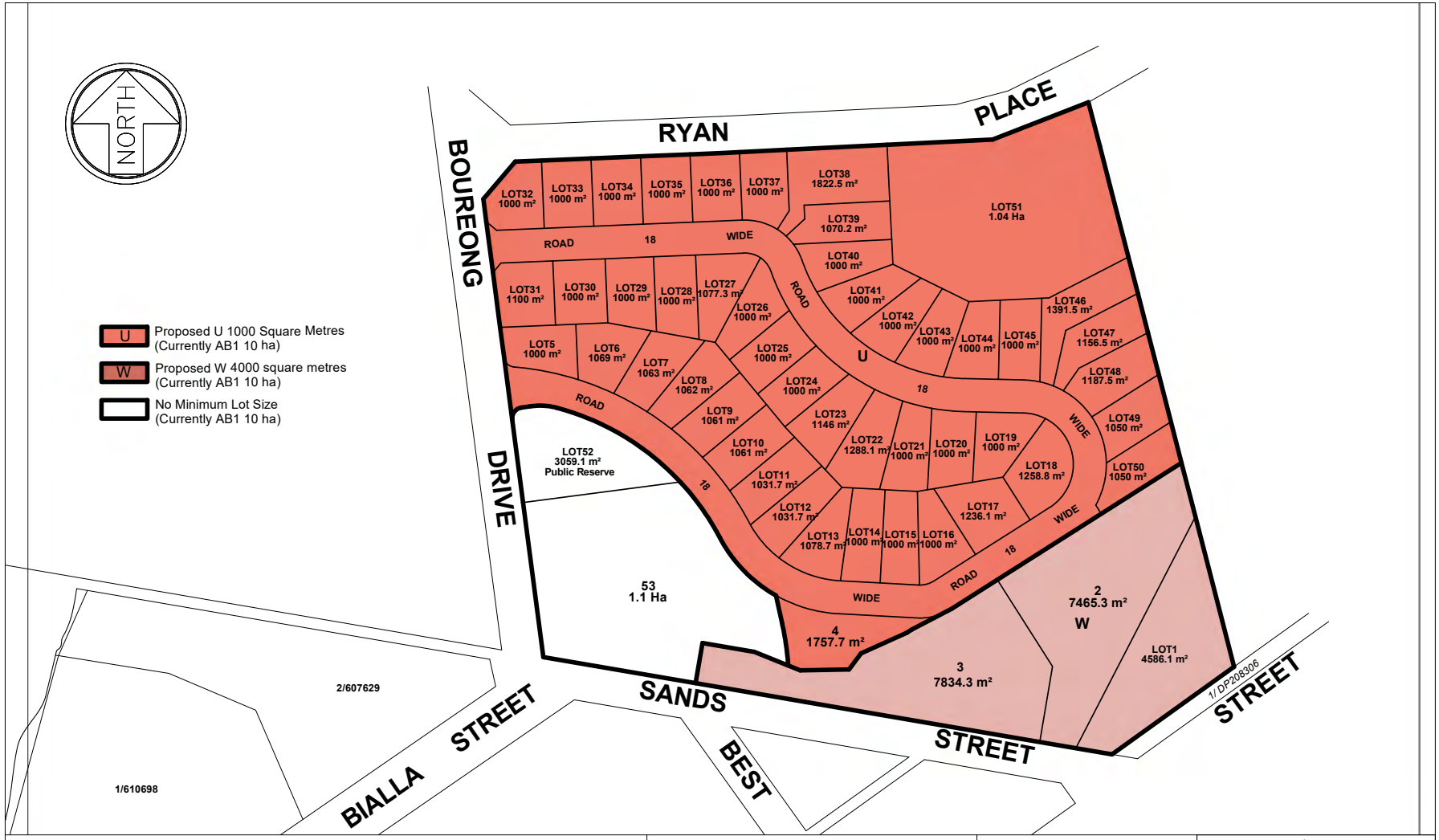
AU124119 R01



PLAN
Showing Planning Proposal
Lot 4 DP 1198749
18 Boureong Drive, Gunning

Laterals Planning
Upstairs, 213 Auburn Street (PO Box 1326)
Goulburn NSW 2580
Phone: 02 4821 0973 Fax 02 3821 0973
18C Winter Street, Tinonee NSW 2430
Mobile: 0427 210 973

Sheet No: 1
No of Sheets: 1
Date: 24 September 2024
PLAN NO: 20022
LAND ZONE MAP



PLAN
Showing Planning Proposal
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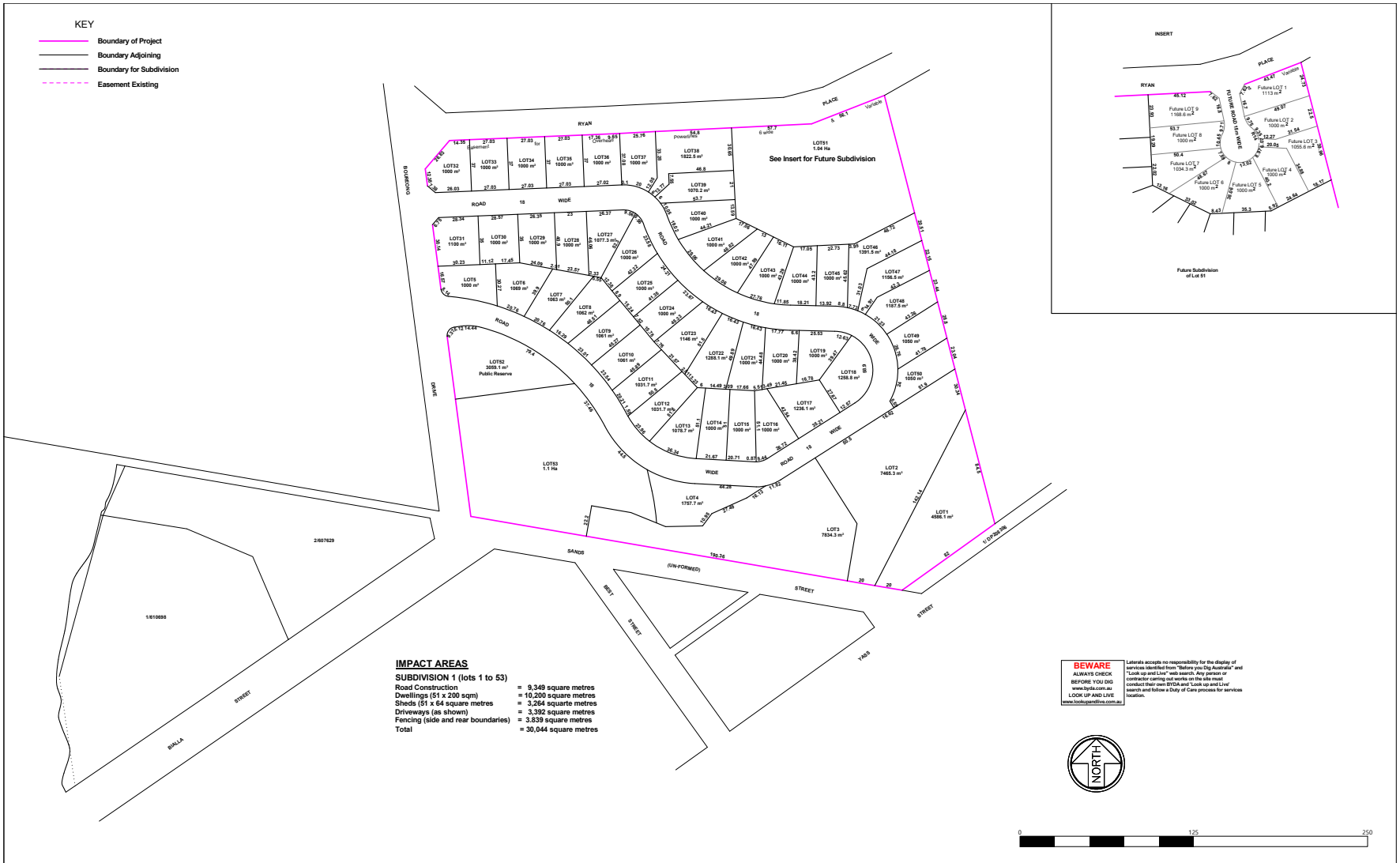
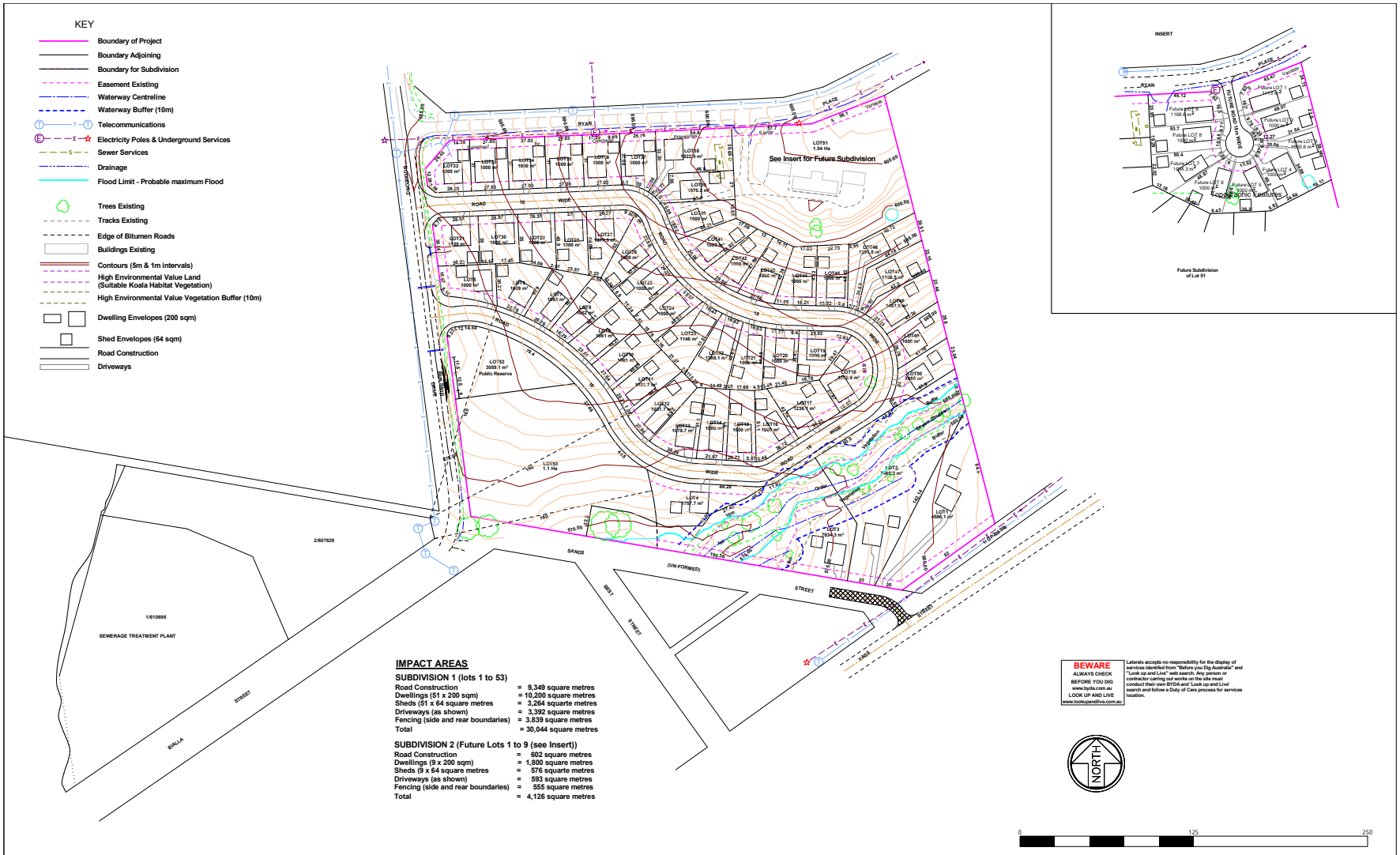
Upstairs, 213 Auburn Street (PO Box 1326)
Goulburn NSW 2580
Phone: 02 4821 0973 Fax 02 3821 0973
18C Winter Street, Tinonee NSW 2430
Mobile: 0427 210 973

Sheet No: 1
No of Sheets: 1
Date: 24 September 2024
PLAN NO: 20022
LOT SIZE MAP



			Surveyed : Southern Cross Consulting Surveyors	SCALE	LATERALS ENGINEERING & MANAGEMENT LATERALS PLANNING	Sheet Subject	UPPER LACHLAN SHIRE COUNCIL
E	Amended Subdivision Design	24/9/2024	Designed : R Mowle	1:1250 on A1		CONCEPT SUBDIVISION	LOT 4 DP 1198749
D	Amended Subdivision Design	12/1/2024	Drawn : K Allen				18 BOUREONG DRIVE, GUNNING
C	Stream Detail and Lot reduction	25/1/2023	Checked : R Mowle	Sheet No. 1 / No. of Sheets 3 / Sheet size A1	1st Floor, 213 Auburn Street Goulburn NSW 2580 Ph: 4821 0973 Fax: 482 0777 48 Johns River Road, Johns River NSW 2443 Mobile 0427 210 973		PLANNING PROPOSAL
B	Amended Design for STP	8/6/2022	Datum : AHD				
A	Original	1/7/2021	Laterals Ref : 20022				
Issue	Amendment	Date					



Issue	Amendment	Date
F	Amended Subdivision Design	24/9/2024
E	Potential Development & Impact Areas	7/8/2024
D	Amended Subdivision Design	12/1/2024
C	Stream Detail and Lot reduction	25/1/2023
B	Amended Design for STP	8/6/2022
A	Original	1/7/2021

Surveyed : Southern Cross Consulting Surveyors
Designed : R Mowle
Drawn : K Allen
Checked : R Mowle
Datum : AHD
Laterals Ref : 20022

SCALE
1:1250 on A1

Sheet No.	No. of Sheets	Sheet size
2	3	A1

LATERALS ENGINEERING & MANAGEMENT
LATERALS PLANNING

1st Floor, 213 Auburn Street
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Ph: 4821 0973 Fax: 482 0777
48 Johns River Road, Johns River NSW 2443
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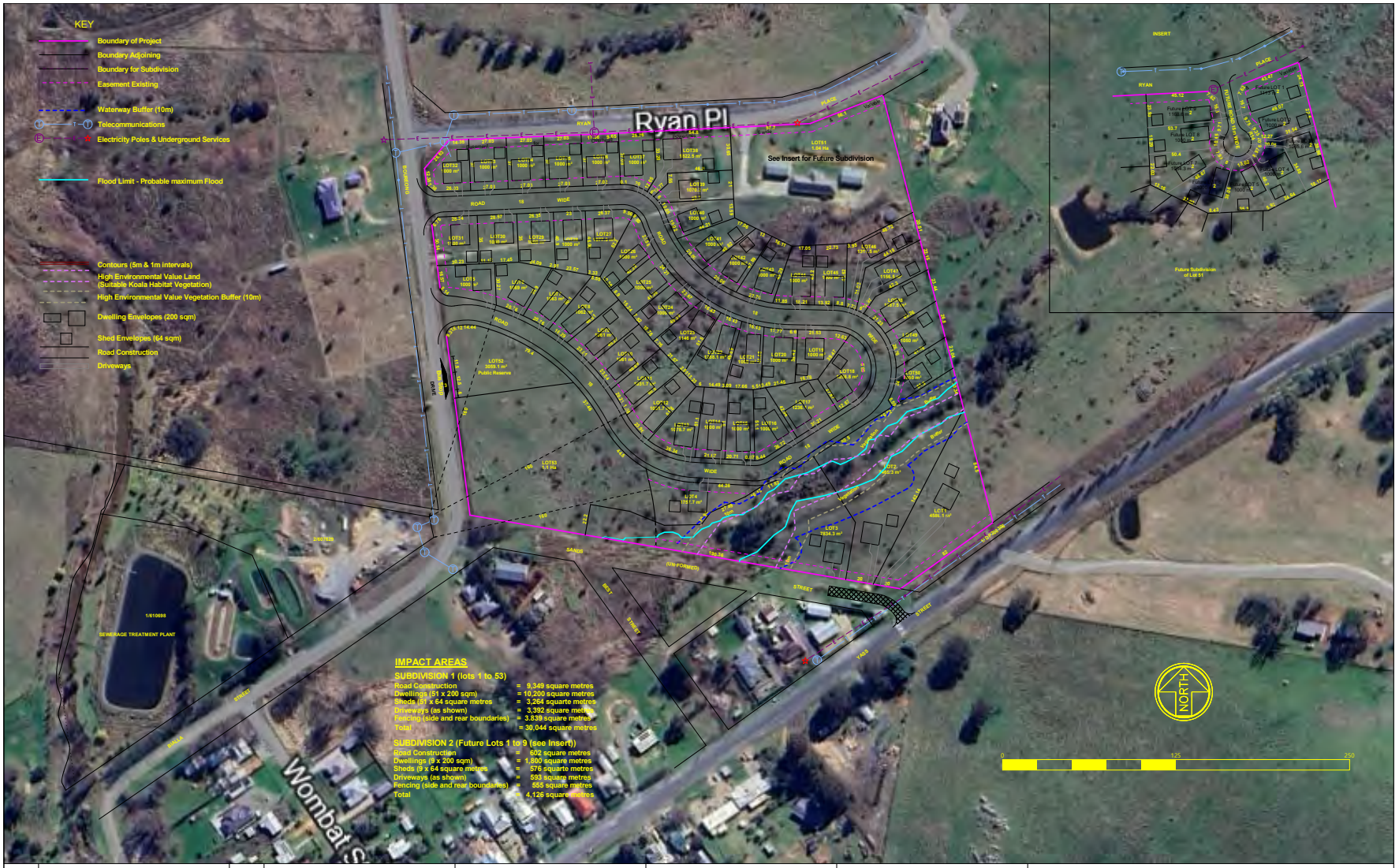
Sheet Subject
CONCEPT SUBDIVISION
TOPOGRAPHIC DETAILS

UPPER LACHLAN SHIRE COUNCIL
LOT 4 DP 1198749
18 BOUREONG DRIVE, GUNNING
PLANNING PROPOSAL



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Surveyed : Southern Cross Consulting Surveyors
Designed : R Mowle
Drawn : K Allen
Checked : R Mowle
Datum : AHD
Laterals Ref : 20022

SCALE
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Sheet No.	No. of Sheets	Sheet size
3	3	A1

LATERALS ENGINEERING
& MANAGEMENT
LATERALS PLANNING

1st Floor, 213 Auburn Street
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Ph: 4821 0973 Fax: 482 0777
48 Johns River Road, Johns River NSW 2443
Mobile 0427 210 973

Sheet Subject
CONCEPT SUBDIVISION
AERIAL PHOTOGRAPH

UPPER LACHLAN SHIRE COUNCIL
LOT 4 DP 1198749
18 BOUREONG DRIVE, GUNNING
PLANNING PROPOSAL

Appendix C Lotsearch Report

LOTSEARCH

LOTSEARCH ENVIRO PROFESSIONAL

Date: 05 Aug 2024 10:28:01

Reference: LS059494 EP

Address: 18 Boureong Drive, Gunning, NSW 2581

Dataset Listing

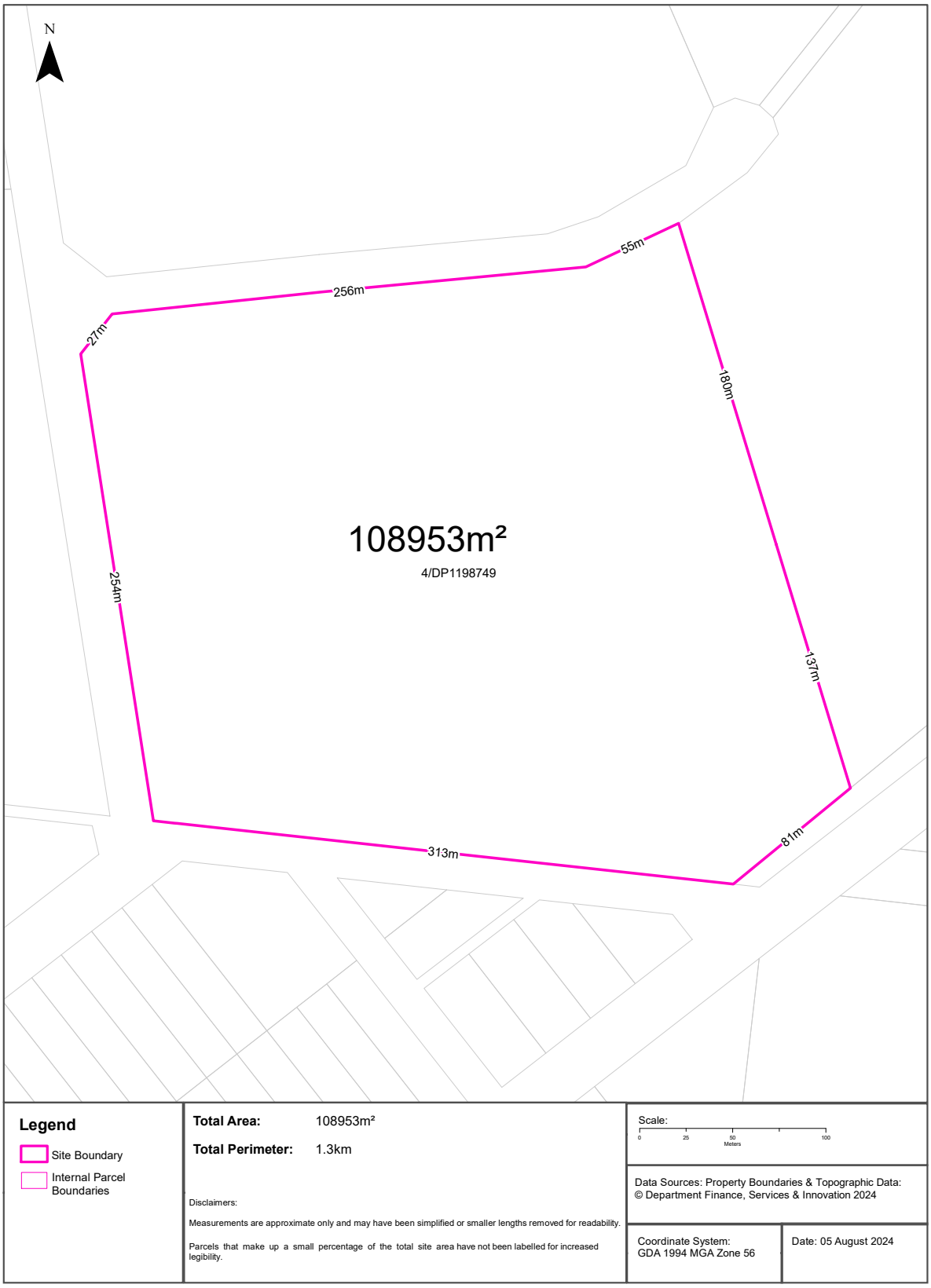
Datasets contained within this report, detailing their source and data currency:

Dataset Name	Custodian	Supply Date	Currency Date	Update Frequency	Dataset Buffer (m)	No. Features On-site	No. Features within 100m	No. Features within Buffer
Cadastre Boundaries	NSW Department of Customer Service - Spatial Services	24/07/2024	24/07/2024	Quarterly	-	-	-	-
Topographic Data	NSW Department of Customer Service - Spatial Services	21/05/2024	21/05/2024	Annually	-	-	-	-
List of NSW contaminated sites notified to EPA	Environment Protection Authority NSW	30/07/2024	10/07/2024	Monthly	1000m	0	0	1
Contaminated Land Records of Notice	Environment Protection Authority NSW	30/07/2024	30/07/2024	Monthly	1000m	0	0	0
Former Gasworks	Environment Protection Authority NSW	28/04/2024	14/07/2021	Quarterly	1000m	0	0	0
Notices under the POEO Act 1997	Environment Protection Authority NSW	30/07/2024	30/07/2024	Monthly	1000m	0	0	2
National Waste Management Facilities Database	Geoscience Australia	29/04/2024	29/11/2022	Annually	1000m	0	0	0
National Liquid Fuel Facilities	Geoscience Australia	20/09/2023	07/09/2020	Annually	1000m	0	0	1
EPA PFAS Investigation Program	Environment Protection Authority NSW	18/07/2024	14/06/2024	Monthly	2000m	0	0	0
Defence PFAS Investigation & Management Program - Investigation Sites	Australian Department of Defence	18/07/2024	29/02/2024	Monthly	2000m	0	0	0
Defence PFAS Investigation & Management Program - Management Sites	Australian Department of Defence	18/07/2024	29/02/2024	Monthly	2000m	0	0	0
Airservices Australia National PFAS Management Program	Airservices Australia	18/07/2024	18/07/2024	Monthly	2000m	0	0	0
Defence Controlled Areas	Australian Department of Defence	17/07/2024	17/07/2024	Quarterly	2000m	0	0	0
Defence 3 Year Regional Contamination Investigation Program	Australian Department of Defence	30/04/2024	02/09/2022	Quarterly	2000m	0	0	0
National Unexploded Ordnance (UXO)	Australian Department of Defence	17/07/2024	17/07/2024	Quarterly	2000m	0	0	0
EPA Other Sites with Contamination Issues	Environment Protection Authority NSW	13/11/2023	15/12/2022	Annually	1000m	0	0	0
Licensed Activities under the POEO Act 1997	Environment Protection Authority NSW	22/07/2024	22/07/2024	Monthly	1000m	0	0	2
Delicensed POEO Activities still regulated by the EPA	Environment Protection Authority NSW	22/07/2024	22/07/2024	Monthly	1000m	0	0	0
Former POEO Licensed Activities now revoked or surrendered	Environment Protection Authority NSW	22/07/2024	22/07/2024	Monthly	1000m	3	3	3
UBD Business Directories (Premise & Intersection Matches)	Hardie Grant			Not required	150m	0	0	0
UBD Business Directories (Road & Area Matches)	Hardie Grant			Not required	150m	-	131	131
UBD Business Directory Dry Cleaners & Motor Garages/Service Stations (Premise & Intersection Matches)	Hardie Grant			Not required	500m	0	0	0
UBD Business Directory Dry Cleaners & Motor Garages/Service Stations (Road & Area Matches)	Hardie Grant			Not required	500m	-	15	15
Points of Interest	NSW Department of Customer Service - Spatial Services	18/07/2024	18/07/2024	Quarterly	1000m	0	0	18
Tanks (Areas)	NSW Department of Customer Service - Spatial Services	18/07/2024	18/07/2024	Quarterly	1000m	0	0	0
Tanks (Points)	NSW Department of Customer Service - Spatial Services	18/07/2024	18/07/2024	Quarterly	1000m	0	0	1
Major Easements	NSW Department of Customer Service - Spatial Services	06/05/2024	06/05/2024	Quarterly	1000m	1	1	2
State Forest	Forestry Corporation of NSW	12/12/2023	11/12/2023	Annually	1000m	0	0	0
Hydrogeology Map of Australia	Geoscience Australia	17/04/2024	19/08/2019	Annually	1000m	1	1	1

Dataset Name	Custodian	Supply Date	Currency Date	Update Frequency	Dataset Buffer (m)	No. Features On-site	No. Features within 100m	No. Features within Buffer
Temporary Water Restriction (Botany Sands Groundwater Source) Order 2018	NSW Department of Climate Change, Energy, the Environment and Water	28/05/2024	23/02/2018	Quarterly	1000m	0	0	0
National Groundwater Information System (NGIS) Boreholes	Bureau of Meteorology; Water NSW	28/05/2024	20/06/2023	Annually	2000m	0	0	18
NSW Seamless Geology Single Layer: Rock Units	NSW Department of Regional NSW	06/12/2023	31/05/2023	Annually	1000m	2	3	5
NSW Seamless Geology Single Layer: Trendlines	NSW Department of Regional NSW	06/12/2023	31/05/2023	Annually	1000m	0	0	0
NSW Seamless Geology Single Layer: Geological Boundaries and Faults	NSW Department of Regional NSW	06/12/2023	31/05/2023	Annually	1000m	0	0	0
Naturally Occurring Asbestos Potential	NSW Department of Regional NSW	26/04/2024	14/03/2024	Annually	1000m	0	0	0
Atlas of Australian Soils	Australian Bureau of Agriculture and Resource Economics and Sciences (ABARES)	12/01/2024	17/02/2011	Annually	1000m	1	1	2
Soil Landscapes of Central and Eastern NSW	NSW Department of Climate Change, Energy, the Environment and Water	12/12/2023	27/07/2020	Annually	1000m	2	2	3
Environmental Planning Instrument Acid Sulfate Soils	NSW Department of Planning, Housing and Infrastructure	08/07/2024	03/05/2024	Monthly	500m	0	-	-
Atlas of Australian Acid Sulfate Soils	CSIRO	12/01/2024	21/02/2013	Annually	1000m	1	1	1
Dryland Salinity - National Assessment	Australian Bureau of Agricultural and Resource Economics and Sciences	03/06/2024	24/05/2024	Annually	1000m	0	0	0
Mining Subsidence Districts	NSW Department of Customer Service	03/05/2024	03/05/2024	Quarterly	1000m	0	0	0
Current Mining Titles	NSW Department of Regional NSW	22/07/2024	22/07/2024	Monthly	1000m	0	0	0
Mining Title Applications	NSW Department of Regional NSW	22/07/2024	22/07/2024	Monthly	1000m	0	0	0
Historic Mining Titles	NSW Department of Regional NSW	22/07/2024	22/07/2024	Monthly	1000m	1	1	2
Environmental Planning Instrument SEPP State Significant Precincts	NSW Department of Planning, Housing and Infrastructure	08/07/2024	08/09/2023	Monthly	1000m	0	0	0
Environmental Planning Instrument Land Zoning	NSW Department of Planning, Housing and Infrastructure	08/07/2024	01/07/2024	Monthly	1000m	1	3	5
Commonwealth Heritage List	Australian Department of Climate Change, Energy, the Environment and Water	20/10/2023	13/04/2022	Annually	1000m	0	0	0
National Heritage List	Australian Department of Climate Change, Energy, the Environment and Water	20/10/2023	13/04/2022	Annually	1000m	0	0	0
State Heritage Register - Curtilages	NSW Department of Planning, Industry and Environment	29/07/2024	05/07/2024	Quarterly	1000m	0	0	1
Environmental Planning Instrument Local Heritage	NSW Department of Planning, Housing and Infrastructure	08/07/2024	28/06/2024	Monthly	1000m	0	0	18
Bush Fire Prone Land	NSW Rural Fire Service	22/07/2024	12/03/2024	Monthly	1000m	1	2	2
NSW Native Vegetation Type Map	NSW Department of Climate Change, Energy, the Environment and Water	28/05/2024	30/11/2023	Quarterly	1000m	1	6	111
Ramsar Wetlands of Australia	Australian Department of Climate Change, Energy, the Environment and Water	16/05/2024	11/04/2024	Annually	1000m	0	0	0
Collaborative Australian Protected Areas Database (CAPAD) 2022 - Terrestrial	Australian Department of Climate Change, Energy, The Environment and Water	04/03/2024	30/06/2022	Annually	1000m	0	0	0
Collaborative Australian Protected Areas Database (CAPAD) 2022 - Marine	Australian Department of Climate Change, Energy, The Environment and Water	04/03/2024	30/06/2022	Annually	1000m	0	0	0
Groundwater Dependent Ecosystems	Bureau of Meteorology	28/05/2024	28/05/2024	Annually	1000m	0	0	1
Inflow Dependent Ecosystems Likelihood	Bureau of Meteorology	28/05/2024	28/05/2024	Annually	1000m	0	0	1
NSW BioNet Species Sightings	NSW Department of Climate Change, Energy, the Environment and Water	10/07/2024	10/07/2024	Monthly	10000m	-	-	-

Site Diagram

18 Boureong Drive, Gunning, NSW 2581



Legend

- Site Boundary
- Internal Parcel Boundaries

Total Area: 108953m²

Total Perimeter: 1.3km

Disclaimers:

Measurements are approximate only and may have been simplified or smaller lengths removed for readability.

Parcels that make up a small percentage of the total site area have not been labelled for increased legibility.

Scale: 0 25 50 100 Meters

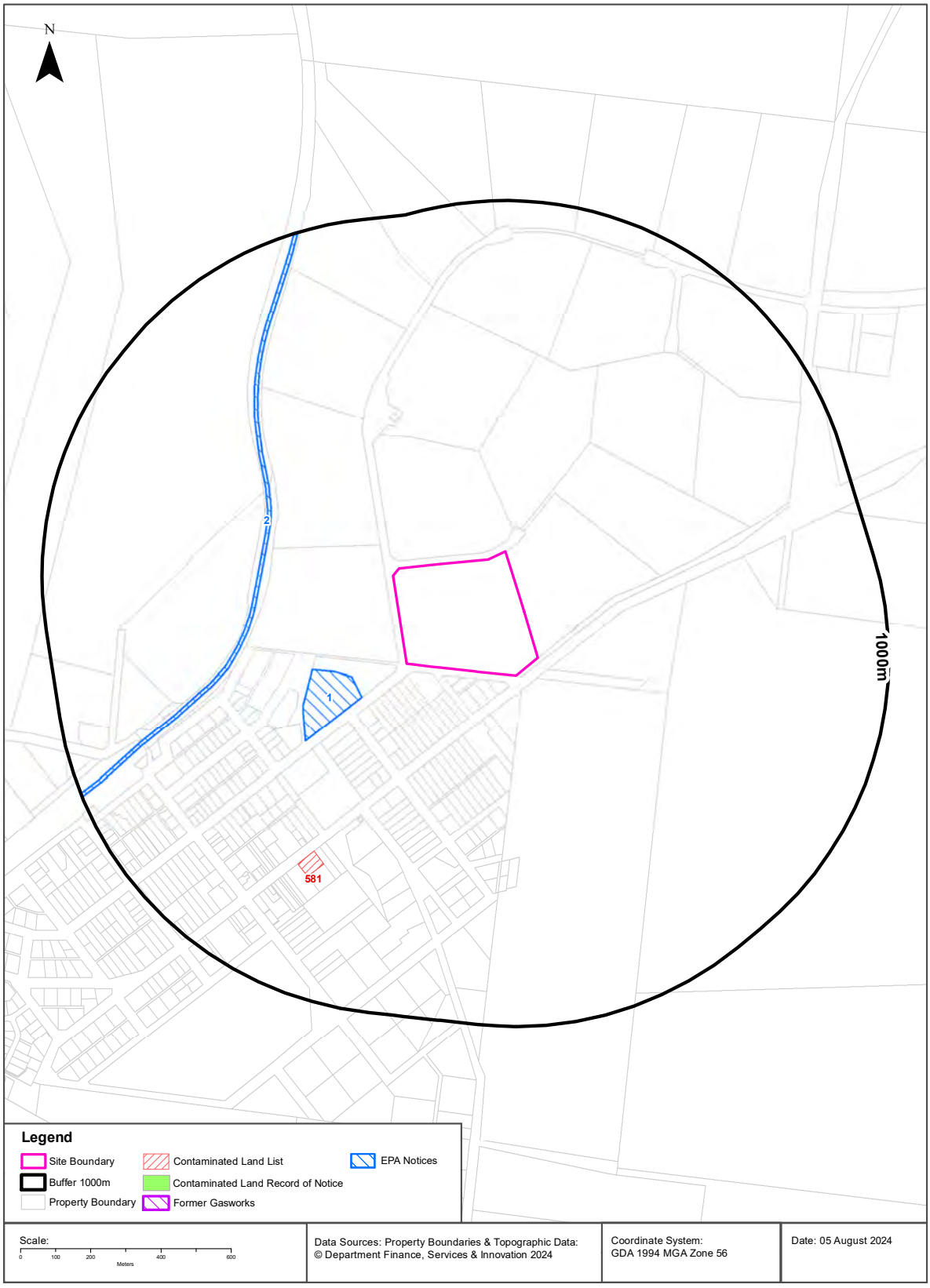
Data Sources: Property Boundaries & Topographic Data: © Department Finance, Services & Innovation 2024

Coordinate System: GDA 1994 MGA Zone 56

Date: 05 August 2024

Contaminated Land

18 Boureong Drive, Gunning, NSW 2581



Contaminated Land

18 Boureong Drive, Gunning, NSW 2581

List of NSW contaminated sites notified to EPA

Records from the NSW EPA Contaminated Land list within the dataset buffer:

Map Id	Site	Address	Suburb	Activity	Management Class	Status	Location Confidence	Dist	Direction
581	Gunning Motors	56 Yass Street	Gunning	Service Station	Regulation under CLM Act not required	Current EPA List	Premise Match	596m	South West

The values within the EPA site management class in the table above, are given more detailed explanations in the table below:

EPA site management class	Explanation
Contamination being managed via the planning process (EP&A Act)	The EPA has completed an assessment of the contamination and decided that the contamination is significant enough to warrant regulation. The contamination of this site is managed by the consent authority under the Environmental Planning and Assessment Act 1979 (EP&A Act) planning approval process, with EPA involvement as necessary to ensure significant contamination is adequately addressed. The consent authority is typically a local council or the Department of Planning and Environment.
Contamination currently regulated under CLM Act	The EPA has completed an assessment of the contamination and decided that the contamination is significant enough to warrant regulation under the Contaminated Land Management Act 1997 (CLM Act). Management of the contamination is regulated by the EPA under the CLM Act. Regulatory notices are available on the EPA's Contaminated Land Public Record of Notices.
Contamination currently regulated under POEO Act	The EPA has completed an assessment of the contamination and decided that the contamination is significant enough to warrant regulation. Management of the contamination is regulated under the Protection of the Environment Operations Act 1997 (POEO Act). The EPA's regulatory actions under the POEO Act are available on the POEO public register.
Contamination formerly regulated under the CLM Act	The EPA has determined that the contamination is no longer significant enough to warrant regulation under the Contaminated Land Management Act 1997 (CLM Act). The contamination was addressed under the CLM Act.
Contamination formerly regulated under the POEO Act	The EPA has determined that the contamination is no longer significant enough to warrant regulation. The contamination was addressed under the Protection of the Environment Operations Act 1997 (POEO Act).
Contamination was addressed via the planning process (EP&A Act)	The EPA has determined that the contamination is no longer significant enough to warrant regulation. The contamination was addressed by the appropriate consent authority via the planning process under the Environmental Planning and Assessment Act 1979 (EP&A Act).
Ongoing maintenance required to manage residual contamination (CLM Act)	The EPA has determined that ongoing maintenance, under the Contaminated Land Management Act 1997 (CLM Act), is required to manage the residual contamination. Regulatory notices under the CLM Act are available on the EPA's Contaminated Land Public Record of Notices.
Regulation being finalised	The EPA has completed an assessment of the contamination and decided that the contamination is significant enough to warrant regulation under the Contaminated Land Management Act 1997. A regulatory approach is being finalised.
Regulation under the CLM Act not required	The EPA has completed an assessment of the contamination and decided that regulation under the Contaminated Land Management Act 1997 is not required.
Under assessment	The contamination is being assessed by the EPA to determine whether regulation is required. The EPA may require further information to complete the assessment. For example, the completion of management actions regulated under the planning process or Protection of the Environment Operations Act 1997. Alternatively, the EPA may require information via a notice issued under s77 of the Contaminated Land Management Act 1997 or issue a Preliminary Investigation Order.

NSW EPA Contaminated Land List Data Source: Environment Protection Authority

Contaminated Land

18 Boureong Drive, Gunning, NSW 2581

Contaminated Land: Records of Notice

Record of Notices within the dataset buffer:

Map Id	Name	Address	Suburb	Notices	Area No	Location Confidence	Distance	Direction
N/A	No records in buffer							

Contaminated Land Records of Notice Data Source: Environment Protection Authority

Terms of use and disclaimer for Contaminated Land: Record of Notices, please visit http://www.epa.nsw.gov.au/clm/clmdisclaimer.htm

Former Gasworks

Former Gasworks within the dataset buffer:

Map Id	Location	Council	Further Info	Location Confidence	Distance	Direction
N/A	No records in buffer					

Former Gasworks Data Source: Environment Protection Authority

Contaminated Land

18 Boureong Drive, Gunning, NSW 2581

EPA Notices

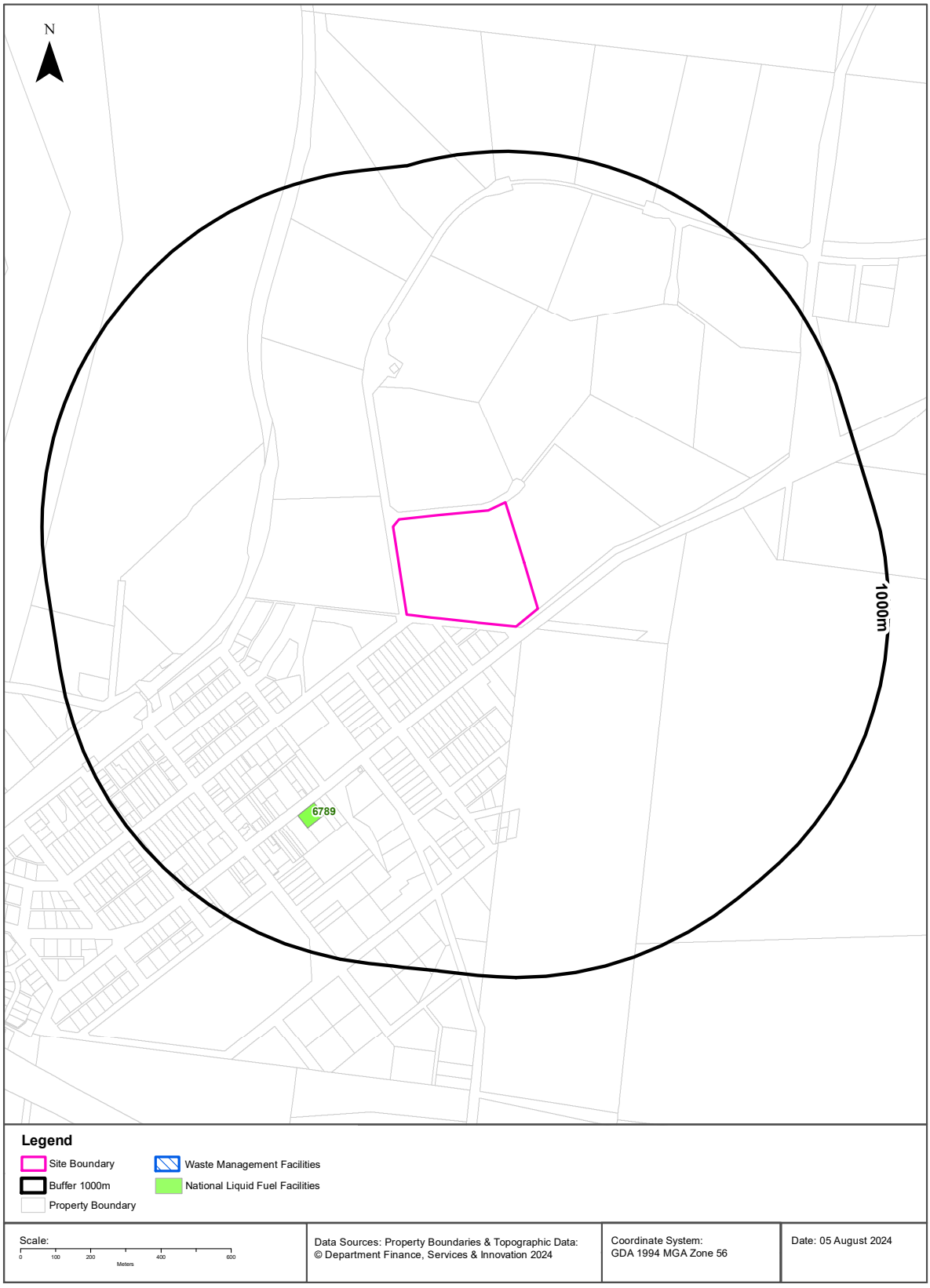
Penalty Notices, s.91 & s.92 Clean up Notices and s.96 Prevention Notices within the dataset buffer:

Map ID	Number	Type	Name	Address	Status	Issued Date	Act	Offence	Offence Date	Loc Conf	Dist	Dir
1	1592697	s.91 Clean Up Notice	UPPER LACHLAN SHIRE COUNCIL	BIALA STREET, GUNNING, NSW 2581	Issued	10/03/2020				Premise Match	158m	South West
2	3085767630	Penalty Notice	PACIFIC NATIONAL (NSW) PTY LTD	Along rail corridor between Bango, Goulburn and Moss Vale , GOULBURN, NSW 2580	Issued	04/02/2013	Protection of the Environment Operations Act 1997 - 120(1)	Pollute waters - Corporation	18/10/2012	Network of Features	370m	West

NSW EPA Notice Data Source: Environment Protection Authority

Waste Management & Liquid Fuel Facilities

18 Boureong Drive, Gunning, NSW 2581



Waste Management & Liquid Fuel Facilities

18 Boureong Drive, Gunning, NSW 2581

National Waste Management Facilities Database

Sites on the National Waste Management Facilities Database within the dataset buffer:

Map ID	Owner	Name	Address	Management Type	Facility Type	Status	Loc Conf	Dist	Dir
N/A	No records in buffer								

Source: Waste Management Facilities Database

National Liquid Fuel Facilities

National Liquid Fuel Facilties within the dataset buffer:

Map Id	Owner	Name	Address	Suburb	Class	Operational Status	Operator	Revision Date	Loc Conf	Dist	Direction
6789	MOBIL	MOBIL GUNNING	56 YASS STREET	GUNNING	PETROL STATION	OPERATIONAL			Premise Match	596m	South West

National Liquid Fuel Facilities Data Source: Geoscience Australia

PFAS Investigation & Management Programs

18 Boureong Drive, Gunning, NSW 2581

EPA PFAS Investigation Program

Sites that are part of the EPA PFAS investigation program, within the dataset buffer:

Map ID	Site	Address	Loc Conf	Dist	Dir
N/A	No records in buffer				

EPA PFAS Investigation Program: Environment Protection Authority

Defence PFAS Investigation Program

Sites being investigated by the Department of Defence for PFAS contamination within the dataset buffer:

Map ID	Base Name	Address	Loc Conf	Dist	Dir
N/A	No records in buffer				

Defence PFAS Investigation Program Data Custodian: Department of Defence, Australian Government

Defence PFAS Management Program

Sites being managed by the Department of Defence for PFAS contamination within the dataset buffer:

Map ID	Base Name	Address	Loc Conf	Dist	Dir
N/A	No records in buffer				

Defence PFAS Management Program Data Custodian: Department of Defence, Australian Government

Airservices Australia National PFAS Management Program

Sites being investigated or managed by Airservices Australia for PFAS contamination within the dataset buffer:

Map ID	Site Name	Impacts	Loc Conf	Dist	Dir
N/A	No records in buffer				

Airservices Australia National PFAS Management Program Data Custodian: Airservices Australia

Defence Sites and Unexploded Ordnance

18 Boureong Drive, Gunning, NSW 2581

Defence Controlled Areas (DCA)

Defence Controlled Areas provided by the Department of Defence within the dataset buffer:

Site ID	Location Name	Loc Conf	Dist	Dir
N/A	No records in buffer			

Defence Controlled Areas, Data Custodian: Department of Defence, Australian Government

Defence 3 Year Regional Contamination Investigation Program (RCIP)

Sites which have been assessed as part of the Defence 3 Year Regional Contamination Investigation Program within the dataset buffer:

Property ID	Base Name	Address	Known Contamination	Loc Conf	Dist	Dir
N/A	No records in buffer					

Defence 3 Year Regional Contamination Investigation Program, Data Custodian: Department of Defence, Australian Government

National Unexploded Ordnance (UXO)

Sites which have been assessed by the Department of Defence for the potential presence of unexploded ordnance within the dataset buffer:

Site ID	Location Name	Category	Area Description	Additional Information	Commonwealth	Loc Conf	Dist	Dir
N/A	No records in buffer							

National Unexploded Ordnance (UXO), Data Custodian: Department of Defence, Australian Government

EPA Other Sites with Contamination Issues

18 Boureong Drive, Gunning, NSW 2581

EPA Other Sites with Contamination Issues

This dataset contains other sites identified on the EPA website as having contamination issues. This dataset currently includes:

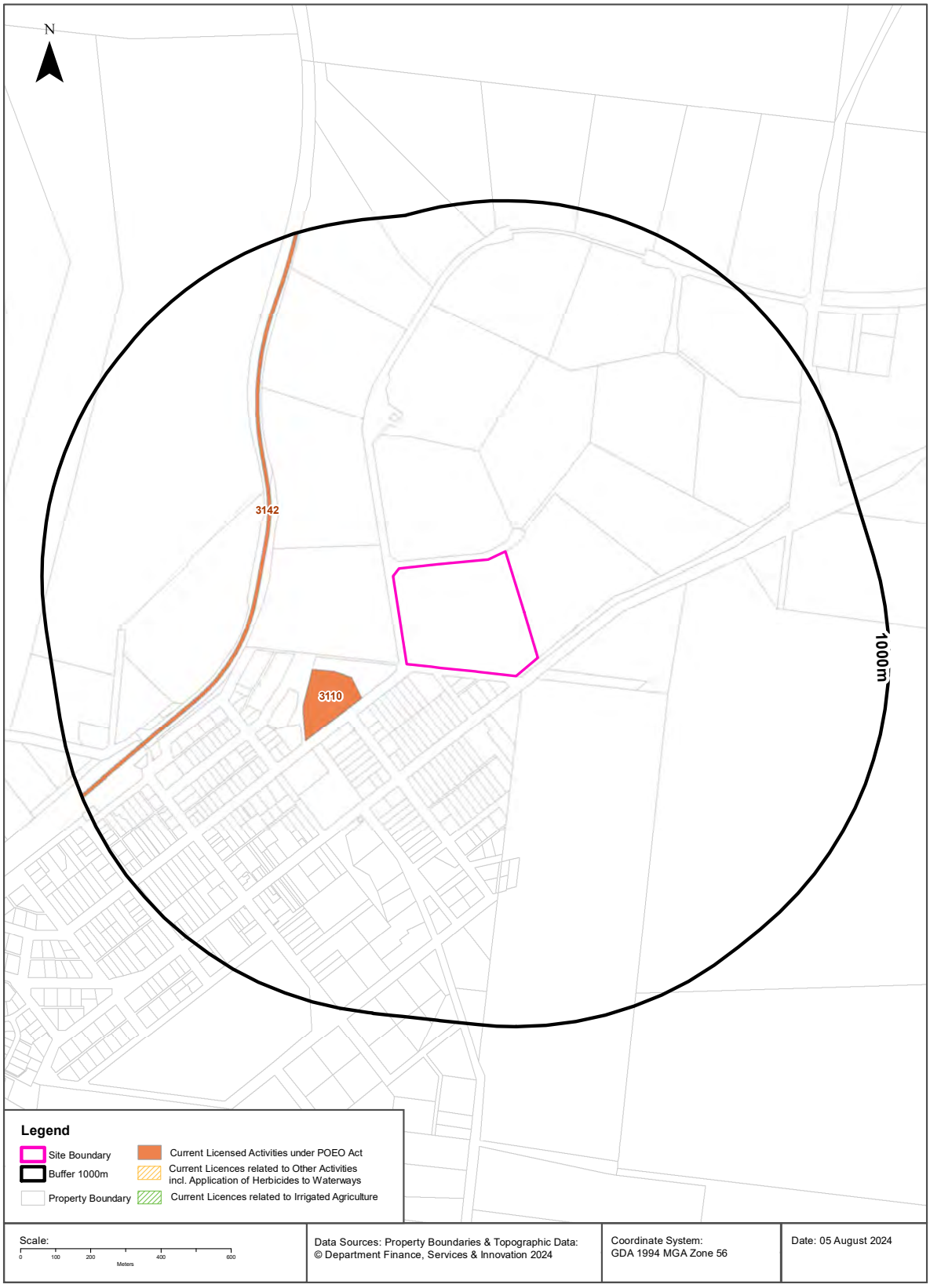
- James Hardie asbestos manufacturing and waste disposal sites
- Radiological investigation sites in Hunter's Hill
- Pasminco Lead Abatement Strategy Area

Sites within the dataset buffer:

Site Id	Site Name	Site Address	Dataset	Comments	Location Confidence	Distance	Direction
N/A	No records in buffer						

Current EPA Licensed Activities

18 Boureong Drive, Gunning, NSW 2581



EPA Activities

18 Boureong Drive, Gunning, NSW 2581

Licensed Activities under the POEO Act 1997

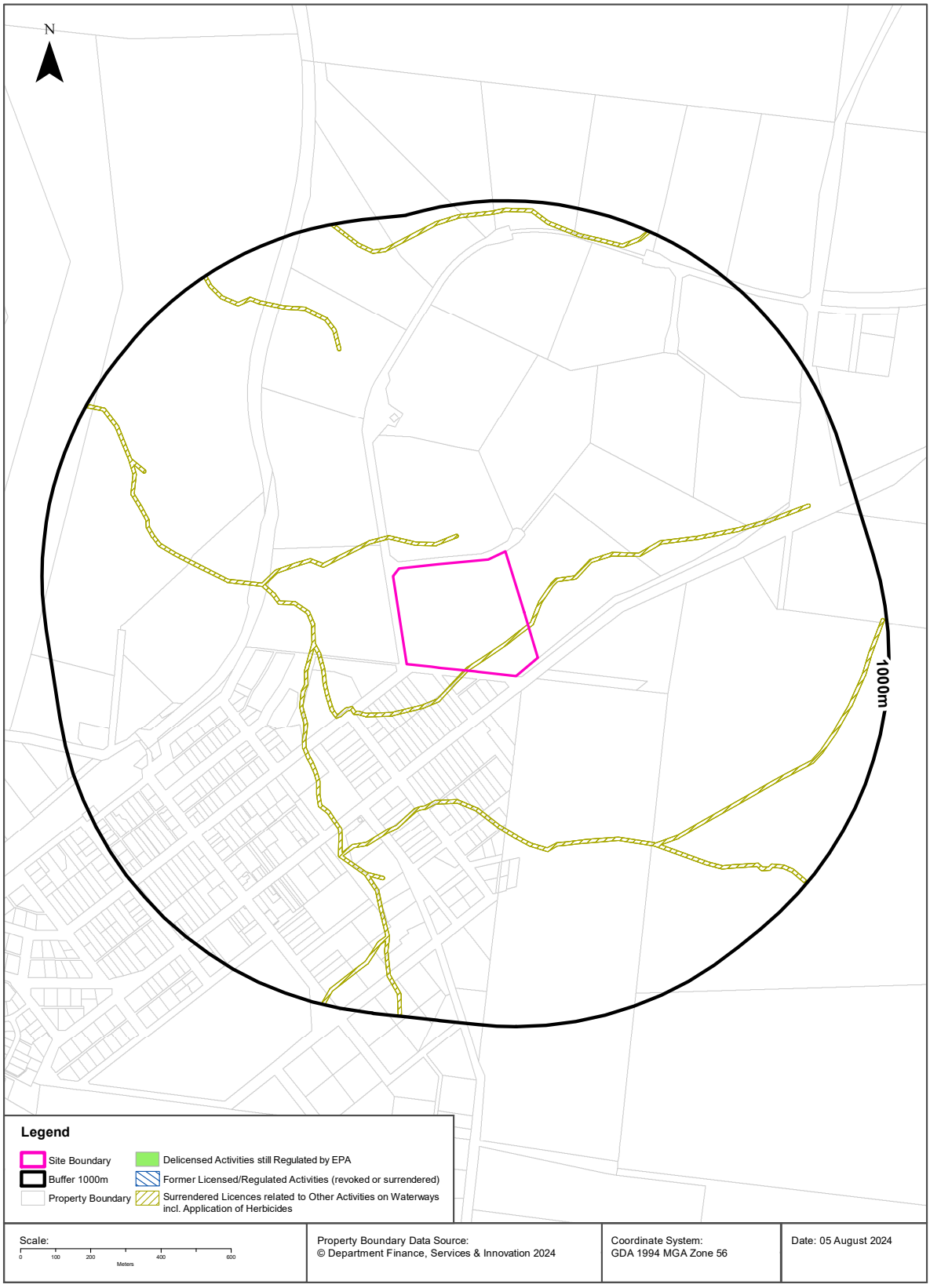
Licensed activities under the Protection of the Environment Operations Act 1997, within the dataset buffer:

EPL	Organisation	Name	Address	Suburb	Activity	Loc Conf	Distance	Direction
3110	UPPER LACHLAN SHIRE COUNCIL	GUNNING SEWAGE TREATMENT PLANT	BIALA STREET	GUNNING	Sewage treatment processing by small plants	Premise Match	158m	South West
3142	AUSTRALIAN RAIL TRACK CORPORATION LIMITED		AUSTRALIAN RAIL TRACK CORPORATION (ARTC) NETWORK, SYDNEY, NSW 2001		Railway systems activities	Network of Features	369m	West

POEO Licence Data Source: Environment Protection Authority

Delicensed & Former Licensed EPA Activities

18 Boureong Drive, Gunning, NSW 2581



EPA Activities

18 Boureong Drive, Gunning, NSW 2581

Delicensed Activities still regulated by the EPA

Delicensed activities still regulated by the EPA, within the dataset buffer:

Licence No	Organisation	Name	Address	Suburb	Activity	Loc Conf	Distance	Direction
N/A	No records in buffer							

Delicensed Activities Data Source: Environment Protection Authority

Former Licensed Activities under the POEO Act 1997, now revoked or surrendered

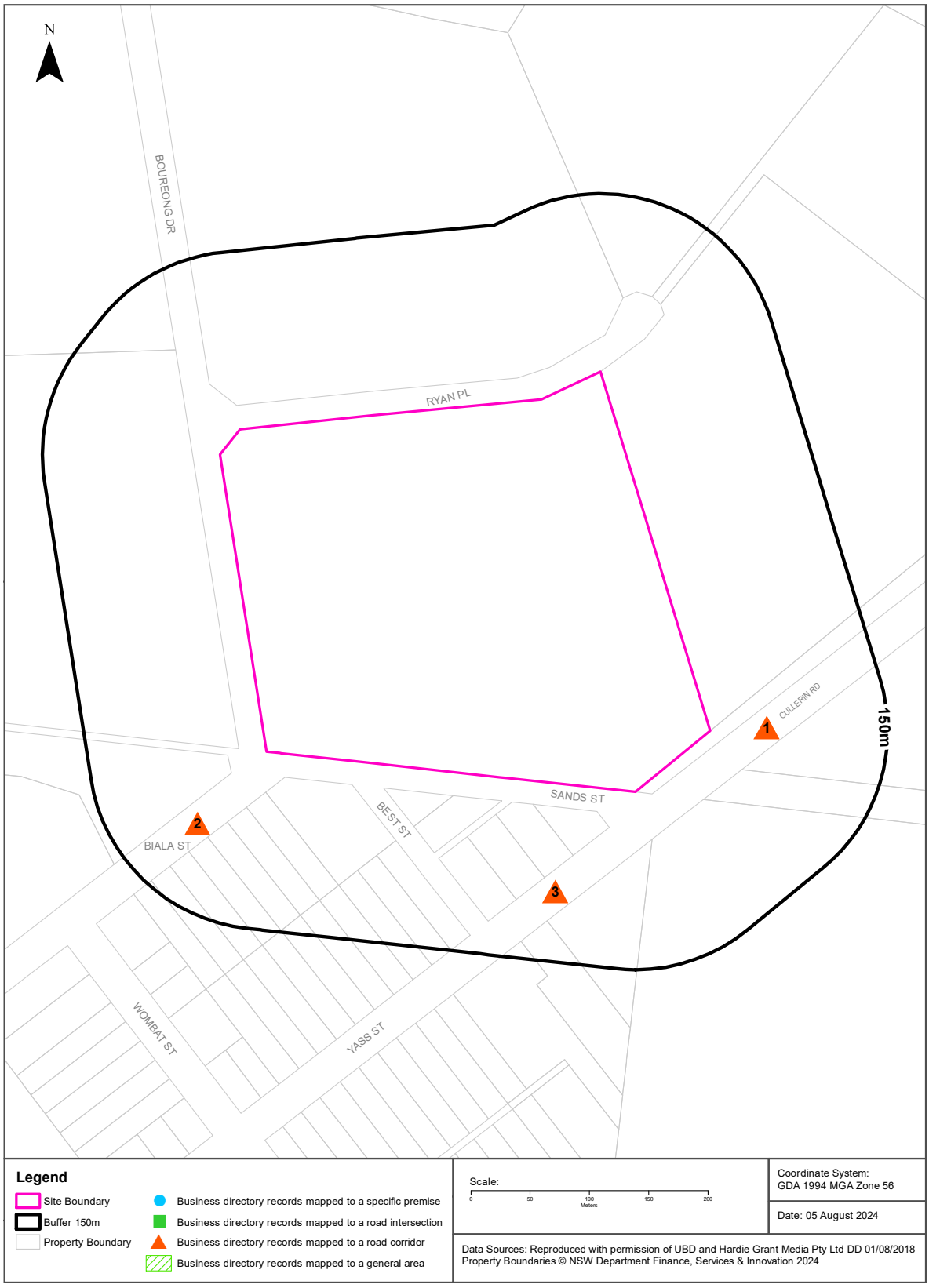
Former Licensed activities under the Protection of the Environment Operations Act 1997, now revoked or surrendered, within the dataset buffer:

Licence No	Organisation	Location	Status	Issued Date	Activity	Loc Conf	Distance	Direction
4653	LUHRMANN ENVIRONMENT MANAGEMENT PTY LTD	WATERWAYS THROUGHOUT NSW	Surrendered	06/09/2000	Other Activities / Non Scheduled Activity - Application of Herbicides	Network of Features	0m	On-site
4838	Robert Orchard	Various Waterways throughout New South Wales - SYDNEY NSW 2000	Surrendered	07/09/2000	Other Activities / Non Scheduled Activity - Application of Herbicides	Network of Features	0m	On-site
6630	SYDNEY WEED & PEST MANAGEMENT PTY LTD	WATERWAYS THROUGHOUT NSW - PROSPECT, NSW, 2148	Surrendered	09/11/2000	Other Activities / Non Scheduled Activity - Application of Herbicides	Network of Features	0m	On-site

Former Licensed Activities Data Source: Environment Protection Authority

Historical Business Directories

18 Boureong Drive, Gunning, NSW 2581



Historical Business Directories

18 Boureong Drive, Gunning, NSW 2581

Business Directory Records 1950-1991
Premise or Road Intersection Matches

Potentially contaminative business activities extracted from Universal Business Directories from years 1991, 1982, 1970, 1961 & 1950, mapped to a premise or road intersection within the dataset buffer:

Map Id	Business Activity	Premise	Ref No.	Year	Location Confidence	Distance to Property Boundary or Road Intersection	Direction
N/A	No records in buffer						

Business Directory Records 1950-1991
Road or Area Matches

Potentially contaminative business activities extracted from Universal Business Directories from years 1991, 1982, 1970, 1961 & 1950, mapped to a road or an area, within the dataset buffer. Records are mapped to the road when a building number is not supplied, cannot be found, or the road has been renumbered since the directory was published:

Map Id	Business Activity	Premise	Ref No.	Year	Location Confidence	Distance to Road Corridor or Area
1	SCHOOLS & COLLEGES-PRIVATE & PUBLIC	Convent of Mercy, Cullerin St., Gunning	207996	1961	Road Match	10m
	SCHOOLS	Convent of Mercy, Cullerin St., Gunning	193882	1950	Road Match	10m
2	HOSPITALS-PRIVATE	Allawah, Biala St., Gunning	193822	1950	Road Match	20m
3	Court House	Court House, Yass St., Gunning 2581	156232	1982	Road Match	32m
	MOTOR GARAGES & SERVICE STATIONS	Gunning Motors, Mtr.Gar., Yass St., Gunning 2581	156236	1982	Road Match	32m
	CHEMISTS-PHARMACEUTICAL	Gunning Pharmacy, The, Yass St., Gunning 2581	156237	1982	Road Match	32m
	SCHOOLS	Gunning Public School, Yass St., Gunning 2581	156238	1982	Road Match	32m
	MOTOR GARAGES & SERVICE STATIONS	Howarth, E. R. & I. J., Mtr.Gar., Yass St., Gunning 2581	156241	1982	Road Match	32m
	MOTOR OIL & SPIRIT DEPOTS	B. P. (Aust.) Limited, Yass St. Gunning 2581	574471	1970	Road Match	32m
	SCHOOLS & COLLEGES-PRIVATE & PUBLIC	Central Public School, Yass St. Gunning 2581	574483	1970	Road Match	32m
	Court House	Court House, Yass St. Gunning 2581	574440	1970	Road Match	32m
	STATION & FARM SUPPLIES	Davies, L. M., Yass St. Gunning 2581	574486	1970	Road Match	32m
	CARRIERS & CARTAGE CONTRACTORS	Gunning Carrying Service, Yass St. Gunning 2581	574428	1970	Road Match	32m
	AGRICULTURAL MACHINERY HIRERS &/OR DEALERS	Gunning Motors, Yass St. Gunning 2581	574405	1970	Road Match	32m
	LAWN MOWER SALES & SERVICE	Gunning Motors, Yass St. Gunning 2581	574452	1970	Road Match	32m
	MOTOR CAR & TRUCK DEALERS-NEW & USED	Gunning Motors, Yass St. Gunning 2581	574466	1970	Road Match	32m
	MOTOR GARAGES & ENGINEERS	Gunning Motors, Yass St. Gunning 2581	574468	1970	Road Match	32m
	MOTOR PAINTERS & PANEL BEATERS	Gunning Motors, Yass St. Gunning 2581	574474	1970	Road Match	32m
	MOTOR TOWING SERVICES	Gunning Motors, Yass St. Gunning 2581	574477	1970	Road Match	32m
	WELDERS-ELECTRIC & OXY	Gunning Motors, Yass St. Gunning 2581	574493	1970	Road Match	32m
	CHEMISTS-PHARMACEUTICAL	Gunning Pharmacy (The), Yass St. Gunning 2581	574429	1970	Road Match	32m
	PHOTOGRAPHIC SUPPLIES	Gunning Pharmacy (The), Yass St. Gunning 2581	574479	1970	Road Match	32m
	VETERINARY SUPPLIES & INSTRUMENTS-RETAIL	Gunning Pharmacy (The), Yass St. Gunning 2581	574491	1970	Road Match	32m
	AGRICULTURAL MACHINERY HIRERS &/OR DEALERS	Highway Garage, Yass St. Gunning 2581	574406	1970	Road Match	32m
	CYCLE DEALERS & ACCESSORIES	Highway Garage, Yass St. Gunning 2581	574431	1970	Road Match	32m
	MOTOR GARAGES & ENGINEERS	Highway Garage, Yass St. Gunning 2581	574469	1970	Road Match	32m
	MOTOR PAINTERS & PANEL BEATERS	Highway Garage, Yass St. Gunning 2581	574475	1970	Road Match	32m
	PLUMBERS' SUPPLIES	Howarth, E. R. & I. J., Yass St. Gunning 2581	574480	1970	Road Match	32m

Map Id	Business Activity	Premise	Ref No.	Year	Location Confidence	Distance to Road Corridor or Area
3	RADIO & TV SALES, SERVICE &/OR HIRERS	Howarth, E. R. &. I. J., Yass St. Gunning 2581	574482	1970	Road Match	32m
	MOTOR BUS SERVICES	Howarth, E. R., Yass St. Gunning 2581	574464	1970	Road Match	32m
	MOTOR GARAGES & ENGINEERS	Junction Service Station, Yass St. Gunning 2581	574470	1970	Road Match	32m
	Police Station	Police Station, Yass St. Gunning 2581	574441	1970	Road Match	32m
	FUNERAL DIRECTORS	Rudd, R. J., Yass St. Gunning 2581	574439	1970	Road Match	32m
	AGRICULTURAL MACHINERY HIRERS &/OR DEALERS	Winchcombe Carson Ltd., Yass St. Gunning 2581	574407	1970	Road Match	32m
	STATION & FARM SUPPLIES	Winchcombe Carson Ltd., Yass St. Gunning 2581	574487	1970	Road Match	32m
	MOTOR OIL & SPIRIT DEPOTS	B.P. (Aust.) Limited., Yass St., Gunning	207982	1961	Road Match	32m
	BAKERS-BREAD	Burns, P., Yass St., Gunning	207914	1961	Road Match	32m
	SCHOOLS & COLLEGES-PRIVATE & PUBLIC	Central Public School, Yass St., Gunning	207995	1961	Road Match	32m
	Court House	Court House, Yass St., Gunning	207951	1961	Road Match	32m
	AGRICULTURAL MACHINERY DEALERS	Davies, L. M., Yass St., Gunning	207909	1961	Road Match	32m
	STATION & FARM SUPPLIES	Davies, L. M., Yass St., Gunning	207998	1961	Road Match	32m
	DRY CLEANERS, PRESSERS & DYERS	Diamond, S. & K., Yass St., Gunning	207937	1961	Road Match	32m
	DRY CLEANERS, PRESSERS & DYERS	Elite Café, Yass St., Gunning	207938	1961	Road Match	32m
	CARRIERS & CARTAGE CONTRACTORS	Gunning Carrying Service, Yass St., Gunning	207921	1961	Road Match	32m
	BUILDERS' SUPPLIERS	Gunning Cash Store, Yass St., Gunning	207916	1961	Road Match	32m
	HARDWARE DEALERS & IRONMONGERS	Gunning Cash Stores, Yass St., Gunning	207958	1961	Road Match	32m
	AGRICULTURAL MACHINERY DEALERS	Gunning Motors, Yass St., Gunning	207910	1961	Road Match	32m
	MOTOR CAR & TRUCK DEALERS-NEW & USED	Gunning Motors, Yass St., Gunning	207973	1961	Road Match	32m
	MOTOR GARAGES & ENGINEERS	Gunning Motors, Yass St., Gunning	207979	1961	Road Match	32m
	MOTOR PAINTERS & PANEL BEATERS	Gunning Motors, Yass St., Gunning	207986	1961	Road Match	32m
	WELDERS-ELECTRIC & OXY	Gunning Motors, Yass St., Gunning	208006	1961	Road Match	32m
	AGRICULTURAL MACHINERY DEALERS	Highway Garage, Yass St., Gunning	207911	1961	Road Match	32m
	CYCLE DEALERS & ACCESSORIES	Highway Garage, Yass St., Gunning	207934	1961	Road Match	32m
	MOTOR CAR & TRUCK DEALERS-NEW & USED	Highway Garage, Yass St., Gunning	207974	1961	Road Match	32m
	MOTOR GARAGES & ENGINEERS	Highway Garage, Yass St., Gunning	207980	1961	Road Match	32m
	MOTOR PAINTERS & PANEL BEATERS	Highway Garage, Yass St., Gunning	207987	1961	Road Match	32m
	STATION & FARM SUPPLIES	Lawton, M., Yass St., Gunning	207999	1961	Road Match	32m
	WOOL, SKIN & HIDE BUYERS	Lawton, M., Yass St., Gunning	208008	1961	Road Match	32m
	WOOL, SKIN & HIDE BUYERS	Lyell and Co., Yass St., Gunning	208009	1961	Road Match	32m
	Police Station	Police Station, Yass St., Gunning	207952	1961	Road Match	32m
	DRY CLEANERS, PRESSERS & DYERS	Rudd, R. J., Yass St., Gunning	207939	1961	Road Match	32m
	PAINT, VARNISH, OIL & COLOUR MERCHANTS	Shaw, W. G. & E. L., Yass St., Gunning	207992	1961	Road Match	32m

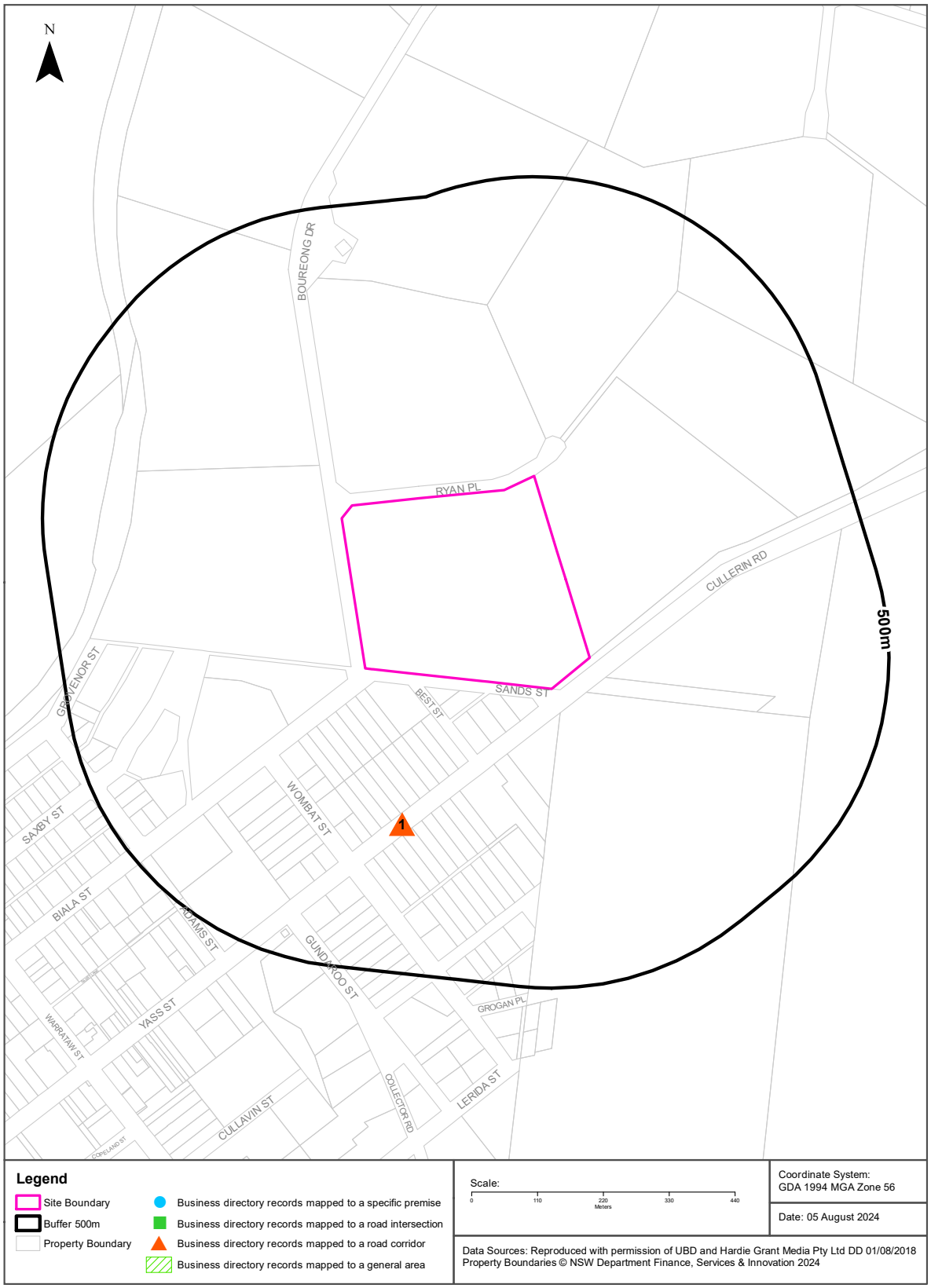
Map Id	Business Activity	Premise	Ref No.	Year	Location Confidence	Distance to Road Corridor or Area
3	AGRICULTURAL MACHINERY DEALERS	Shaw, W. G. and E. L., Yass St., Gunning	207912	1961	Road Match	32m
	BUILDERS' SUPPLIERS	Shaw, W. G. and E. L., Yass St., Gunning	207917	1961	Road Match	32m
	HARDWARE DEALERS & IRONMONGERS	Shaw, W. G. and E. L., Yass St., Gunning	207959	1961	Road Match	32m
	RADIO SALES & SERVICEMEN	Shaw, W. G. and E. L., Yass St., Gunning	207994	1961	Road Match	32m
	MOTOR CAR & TRUCK DEALERS-NEW & USED	Sheldrick, L. W., Yass St., Gunning	207975	1961	Road Match	32m
	MOTOR GARAGES & ENGINEERS	Sheldrick, L. W., Yass St., Gunning	207981	1961	Road Match	32m
	MOTOR PAINTERS & PANEL BEATERS	Sheldrick, L. W., Yass St., Gunning	207988	1961	Road Match	32m
	WELDERS-ELECTRIC & OXY	Sheldrick, L. W., Yass St., Gunning	208007	1961	Road Match	32m
	BAKERS & PASTRYCOOKS	Birch, S. E., Yass St., Gunning	193775	1950	Road Match	32m
	BAKERS & PASTRYCOOKS	Birch's Bakery, Yass St., Gunning	193776	1950	Road Match	32m
	AGRICULTURAL MACHINERY AGENTS	Birch's Garage (Agent, H. V. McKay, Massey Harris),Yass St., Gunning	193765	1950	Road Match	32m
	MOTOR PAINTERS & PANEL BEATERS	Birch's Garage Yass St., Gunning	193869	1950	Road Match	32m
	CYCLE DEALERS & SERVICEMEN	Birch's Garage, Yass St., Gunning	193791	1950	Road Match	32m
	MOTOR CAR & TRUCK DEALERS	Birch's Garage, Yass St., Gunning	193845	1950	Road Match	32m
	MOTOR GARAGES & ENGINEERS	Birch's Garage, Yass St., Gunning	193852	1950	Road Match	32m
	MOTOR PAINTERS & PANEL BEATERS	Birch's Garage, Yass St., Gunning	193861	1950	Road Match	32m
	MOTOR TOWING SERVICES	Birch's Garage, Yass St., Gunning	193865	1950	Road Match	32m
	RADIO DEALERS & SERVICEMEN	Birch's Garage, Yass St., Gunning	193876	1950	Road Match	32m
	TAXIS	Birch's Garage, Yass St., Gunning	193895	1950	Road Match	32m
	TRACTOR DEALERS & REPAIRERS	Birch's Garage, Yass St., Gunning	193897	1950	Road Match	32m
	TYRE DEALERS & REPAIRERS	Birch's Garage, Yass St., Gunning	193901	1950	Road Match	32m
	WELDERS-OXY &/OR ELECTRIC	Birch's Garage, Yass St., Gunning	193906	1950	Road Match	32m
	MOTOR BUS SERVICES	Birch's Garage,Yass St., Gunning	193842	1950	Road Match	32m
	FUNERAL DIRECTORS	Caldwell, J., Yass St., Gunning	193809	1950	Road Match	32m
	SCHOOLS	Central Public School, Yass St., Gunning	193881	1950	Road Match	32m
	Court House	Court House, Yass St., Gunning	193810	1950	Road Match	32m
	AGRICULTURAL MACHINERY AGENTS	Davis, Les. M., Yass St., Gunning	193766	1950	Road Match	32m
	STATION SUPPLIES	Davis, Les. M., Yass St., Gunning	193887	1950	Road Match	32m
	AGRICULTURAL MACHINERY AGENTS	Gunning Motors, Yass St., Gunning	193767	1950	Road Match	32m
	ENGINEERS-GENERAL	Gunning Motors, Yass St., Gunning	193805	1950	Road Match	32m
	MOTOR CAR & TRUCK DEALERS	Gunning Motors, Yass St., Gunning	193846	1950	Road Match	32m
	MOTOR CYCLE DEALERS	Gunning Motors, Yass St., Gunning	193850	1950	Road Match	32m
	MOTOR GARAGES & ENGINEERS	Gunning Motors, Yass St., Gunning	193853	1950	Road Match	32m
	MOTOR PAINTERS & PANEL BEATERS	Gunning Motors, Yass St., Gunning	193862	1950	Road Match	32m
	MOTOR TOWING SERVICES	Gunning Motors, Yass St., Gunning	193866	1950	Road Match	32m

Map Id	Business Activity	Premise	Ref No.	Year	Location Confidence	Distance to Road Corridor or Area
3	RADIO DEALERS & SERVICEMEN	Gunning Motors, Yass St., Gunning	193877	1950	Road Match	32m
	TRACTOR DEALERS & REPAIRERS	Gunning Motors, Yass St., Gunning	193898	1950	Road Match	32m
	TYRE DEALERS & REPAIRERS	Gunning Motors, Yass St., Gunning	193902	1950	Road Match	32m
	WELDERS-OXY &/OR ELECTRIC	Gunning Motors, Yass St., Gunning	193907	1950	Road Match	32m
	MOTOR TOWING SERVICES	Gunning Motors.Yass St., Gunning	193870	1950	Road Match	32m
	AGRICULTURAL MACHINERY AGENTS	Gunning Sales and Service, Yass St., Gunning	193768	1950	Road Match	32m
	MOTOR CAR & TRUCK DEALERS	Gunning Sales and Service, Yass St., Gunning	193847	1950	Road Match	32m
	MOTOR CYCLE DEALERS	Gunning Sales and Service, Yass St., Gunning	193849	1950	Road Match	32m
	MOTOR GARAGES & ENGINEERS	Gunning Sales and Service, Yass St., Gunning	193854	1950	Road Match	32m
	MOTOR PAINTERS & PANEL BEATERS	Gunning Sales and Service, Yass St., Gunning	193863	1950	Road Match	32m
	MOTOR TOWING SERVICES	Gunning Sales and Service, Yass St., Gunning	193867	1950	Road Match	32m
	RADIO DEALERS & SERVICEMEN	Gunning Sales and Service, Yass St., Gunning	193878	1950	Road Match	32m
	TRACTOR DEALERS & REPAIRERS	Gunning Sales and Service, Yass St., Gunning	193899	1950	Road Match	32m
	TYRE DEALERS & REPAIRERS	Gunning Sales and Service, Yass St., Gunning	193903	1950	Road Match	32m
	WELDERS-OXY &/OR ELECTRIC	Gunning Sales and Service, Yass St., Gunning	193908	1950	Road Match	32m
	SKIN & HIDE MERCHANTS	Lawton, M., Yass St., Gunning	193883	1950	Road Match	32m
	SKIN & HIDE MERCHANTS	Lyell and Co.,Yass St., Gunning	193884	1950	Road Match	32m
	CARRIERS & CARTAGE CONTRACTORS	Medway, E. W., Yass St., Gunning	193785	1950	Road Match	32m
	REFRIGERATOR DEALERS &/OR SERVICEMEN	Mill's Cash Store, Yass St., Gunning	193880	1950	Road Match	32m
	STATION SUPPLIES	Mill's Cash Store, Yass St., Gunning	193888	1950	Road Match	32m
	BUILDERS' SUPPLIES	Mill's Cash Stores, Yass St., Gunning	193778	1950	Road Match	32m
	HARDWARE & IRONMONGERY RETAILERS	Mill's Cash Stores, Yass St., Gunning	193820	1950	Road Match	32m
	AGRICULTURAL MACHINERY AGENTS	Morgan, Jack (Agent, Moffat-Virtue),Yass St., Gunning	193769	1950	Road Match	32m
	MOTOR OIL & SPIRIT MERCHANTS	Morgan, Jack (Agent, Shell Co. of Aust. Ltd.), Yass St., Gunning	193858	1950	Road Match	32m
	STATION SUPPLIES	Morgan, Jack, Yass St., Gunning	193889	1950	Road Match	32m
	AGRICULTURAL MACHINERY AGENTS	Newman, A. J., Yass St., Gunning	193770	1950	Road Match	32m
	STATION SUPPLIES	Newman,A. J. Yass St., Gunning	193890	1950	Road Match	32m
	MOTOR BUS SERVICES	Red Wings Bus And Hire Service Yass St., Gunning	193868	1950	Road Match	32m
	MOTOR BUS SERVICES	Red Wings Bus and Hire Service, Yass St., Gunning	193843	1950	Road Match	32m
	TAXIS	Red Wings Bus and Hire Service, Yass St., Gunning	193896	1950	Road Match	32m
	DRY CLEANERS, PRESSERS & DYERS	Rudd, O. A (Crookwell Dry Clener), Yass St., Gunning	193798	1950	Road Match	32m
	FRUITERERS	S.and D. Stores,Yass St., Gunning	193808	1950	Road Match	32m
	HARDWARE & IRONMONGERY RETAILERS	Wells, H. G., Yass St., Gunning	193821	1950	Road Match	32m

Map Id	Business Activity	Premise	Ref No.	Year	Location Confidence	Distance to Road Corridor or Area
3	RADIO DEALERS & SERVICEMEN	Wells, H. G., Yass St., Gunning	193879	1950	Road Match	32m

Dry Cleaners, Motor Garages & Service Stations

18 Boureong Drive, Gunning, NSW 2581



Historical Business Directories

18 Boureong Drive, Gunning, NSW 2581

Dry Cleaners, Motor Garages & Service Stations Premise or Road Intersection Matches

Dry Cleaners, Motor Garages & Service Stations from UBD Business Directories, mapped to a premise or road intersection, within the dataset buffer.

Map Id	Business Activity	Premise	Ref No.	Year	Location Confidence	Distance to Property Boundary or Road Intersection	Direction
N/A	No records in buffer						

Dry Cleaners, Motor Garages & Service Stations Road or Area Matches

Dry Cleaners, Motor Garages & Service Stations from UBD Business Directories, mapped to a road or an area, within the dataset buffer. Records are mapped to the road when a building number is not supplied, cannot be found, or the road has been renumbered since the directory was published.

Map Id	Business Activity	Premise	Ref No.	Year	Location Confidence	Distance to Road Corridor or Area
1	MOTOR GARAGES & SERVICE STATIONS	Gunning Motors, Mtr.Gar., Yass St., Gunning 2581	156236	1982	Road Match	32m
	MOTOR GARAGES & SERVICE STATIONS	Howarth, E. R. & I. J., Mtr.Gar., Yass St., Gunning 2581	156241	1982	Road Match	32m
	MOTOR GARAGES & ENGINEERS	Gunning Motors, Yass St. Gunning 2581	574468	1970	Road Match	32m
	MOTOR GARAGES & ENGINEERS	Highway Garage, Yass St. Gunning 2581	574469	1970	Road Match	32m
	MOTOR GARAGES & ENGINEERS	Junction Service Station, Yass St. Gunning 2581	574470	1970	Road Match	32m
	DRY CLEANERS, PRESSERS & DYERS	Diamond, S. & K., Yass St., Gunning	207937	1961	Road Match	32m
	DRY CLEANERS, PRESSERS & DYERS	Elite Café, Yass St., Gunning	207938	1961	Road Match	32m
	MOTOR GARAGES & ENGINEERS	Gunning Motors, Yass St., Gunning	207979	1961	Road Match	32m
	MOTOR GARAGES & ENGINEERS	Highway Garage, Yass St., Gunning	207980	1961	Road Match	32m
	DRY CLEANERS, PRESSERS & DYERS	Rudd, R. J., Yass St., Gunning	207939	1961	Road Match	32m
	MOTOR GARAGES & ENGINEERS	Sheldrick, L. W., Yass St., Gunning	207981	1961	Road Match	32m
	MOTOR GARAGES & ENGINEERS	Birch's Garage, Yass St., Gunning	193852	1950	Road Match	32m
	MOTOR GARAGES & ENGINEERS	Gunning Motors, Yass St., Gunning	193853	1950	Road Match	32m
	MOTOR GARAGES & ENGINEERS	Gunning Sales and Service, Yass St., Gunning	193854	1950	Road Match	32m
	DRY CLEANERS, PRESSERS & DYERS	Rudd, O. A (Crookwell Dry Clener), Yass St., Gunning	193798	1950	Road Match	32m

Aerial Imagery 2023

18 Boureong Drive, Gunning, NSW 2581

Aerial Imagery 2012

18 Boureong Drive, Gunning, NSW 2581

Aerial Imagery 2003

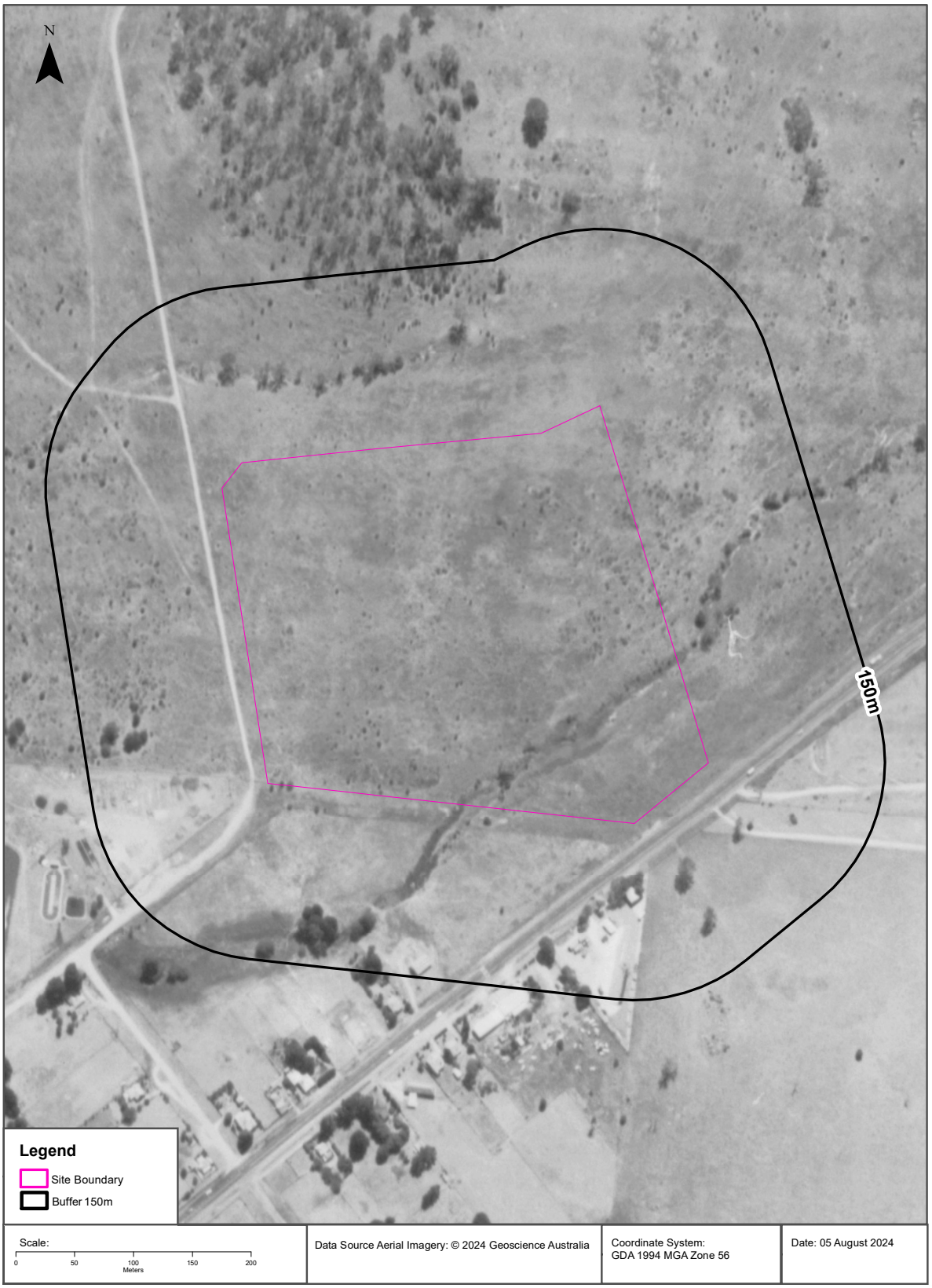
18 Boureong Drive, Gunning, NSW 2581

Aerial Imagery 1997

18 Boureong Drive, Gunning, NSW 2581

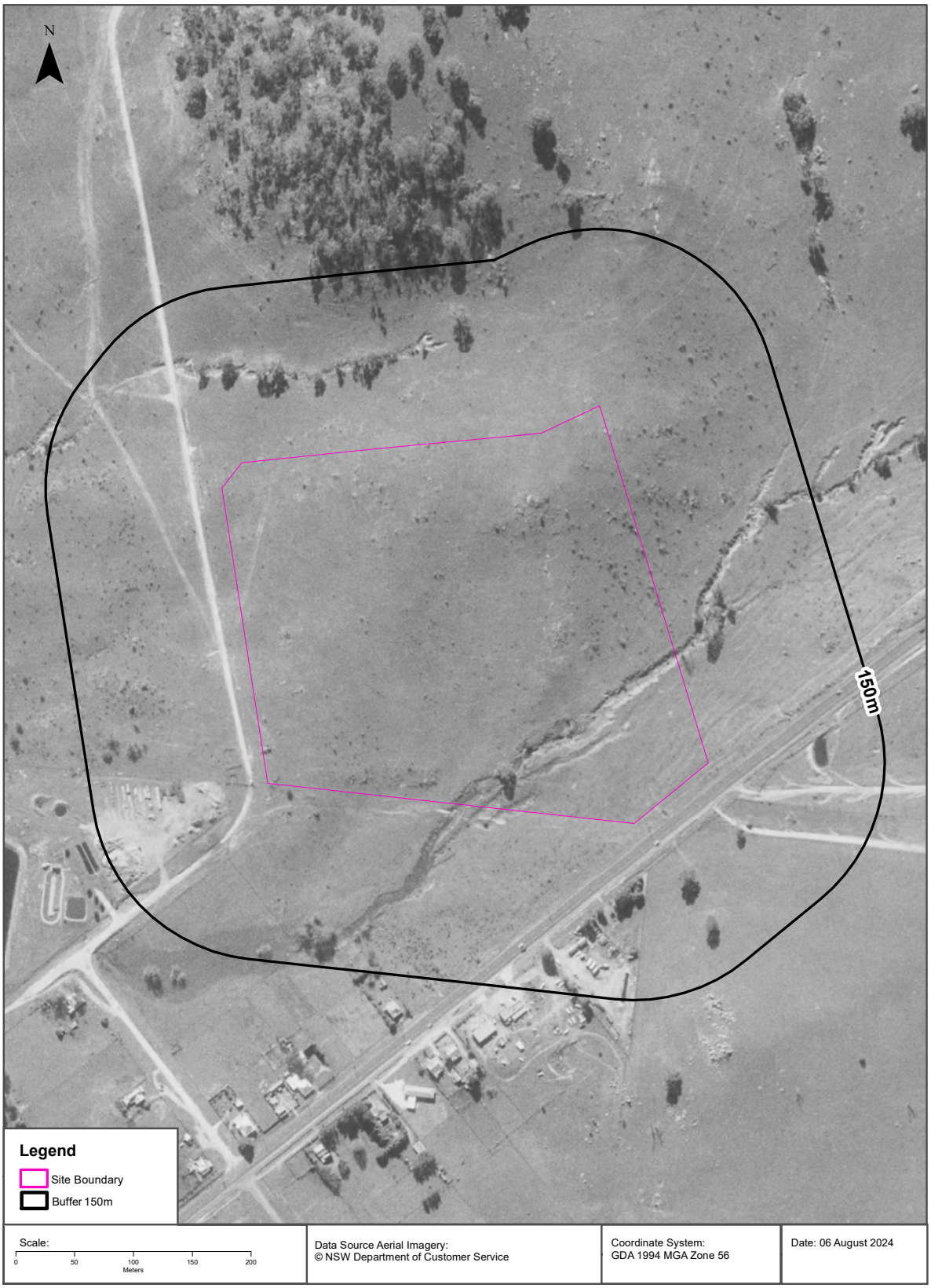
Aerial Imagery 1989

18 Boureong Drive, Gunning, NSW 2581



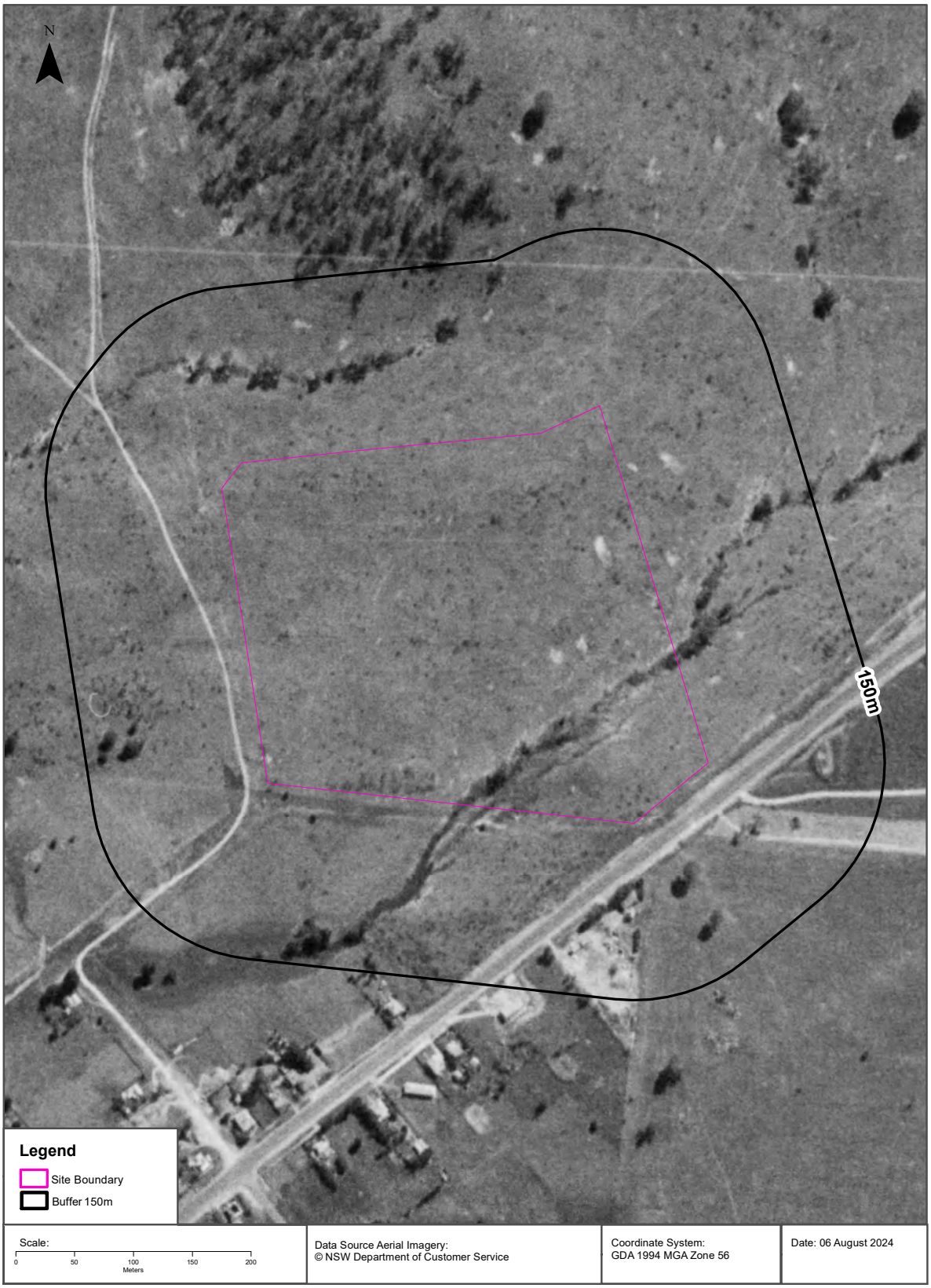
Aerial Imagery 1983

18 Boureong Drive, Gunning, NSW 2581



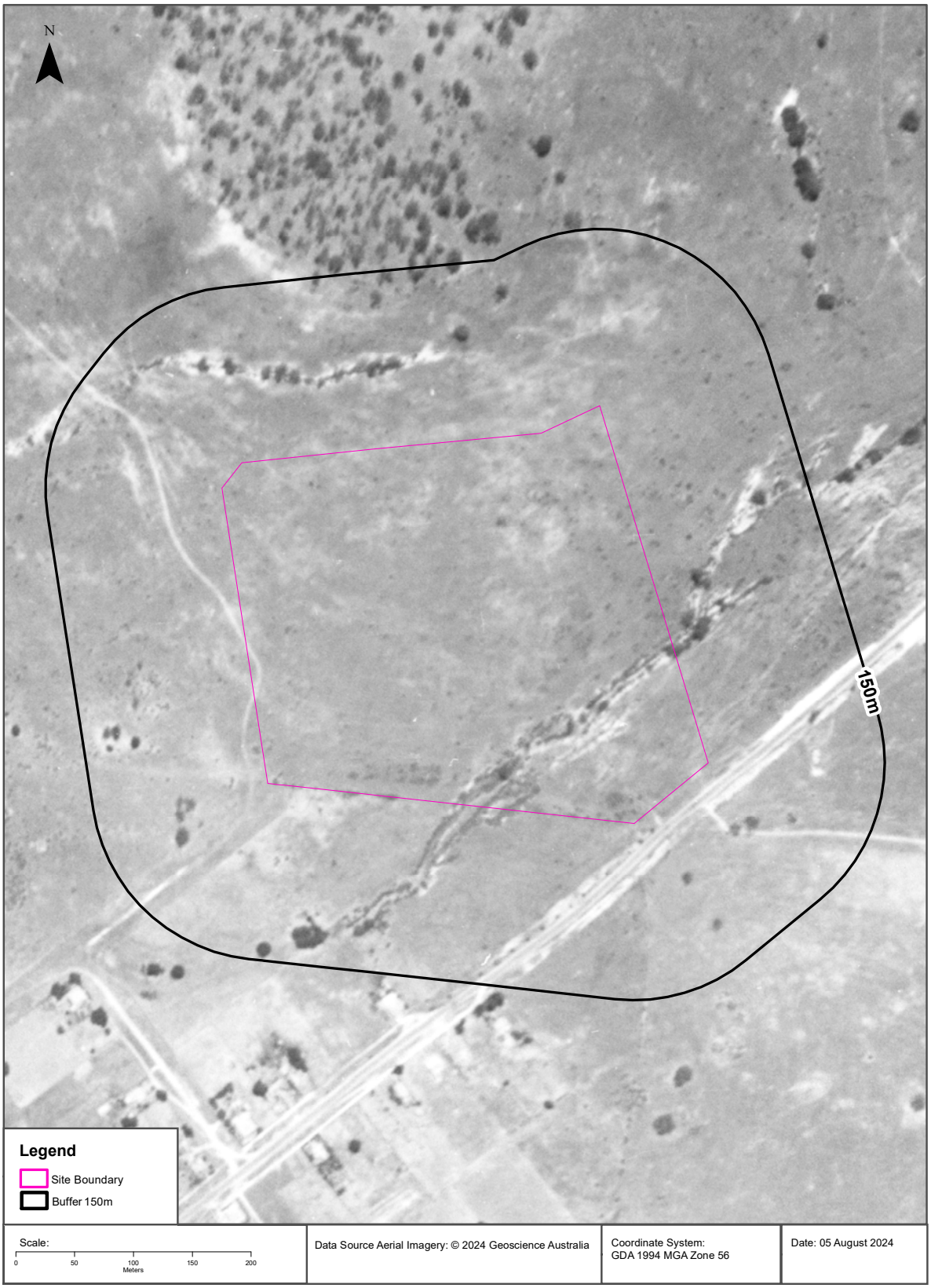
Aerial Imagery 1973

18 Boureong Drive, Gunning, NSW 2581



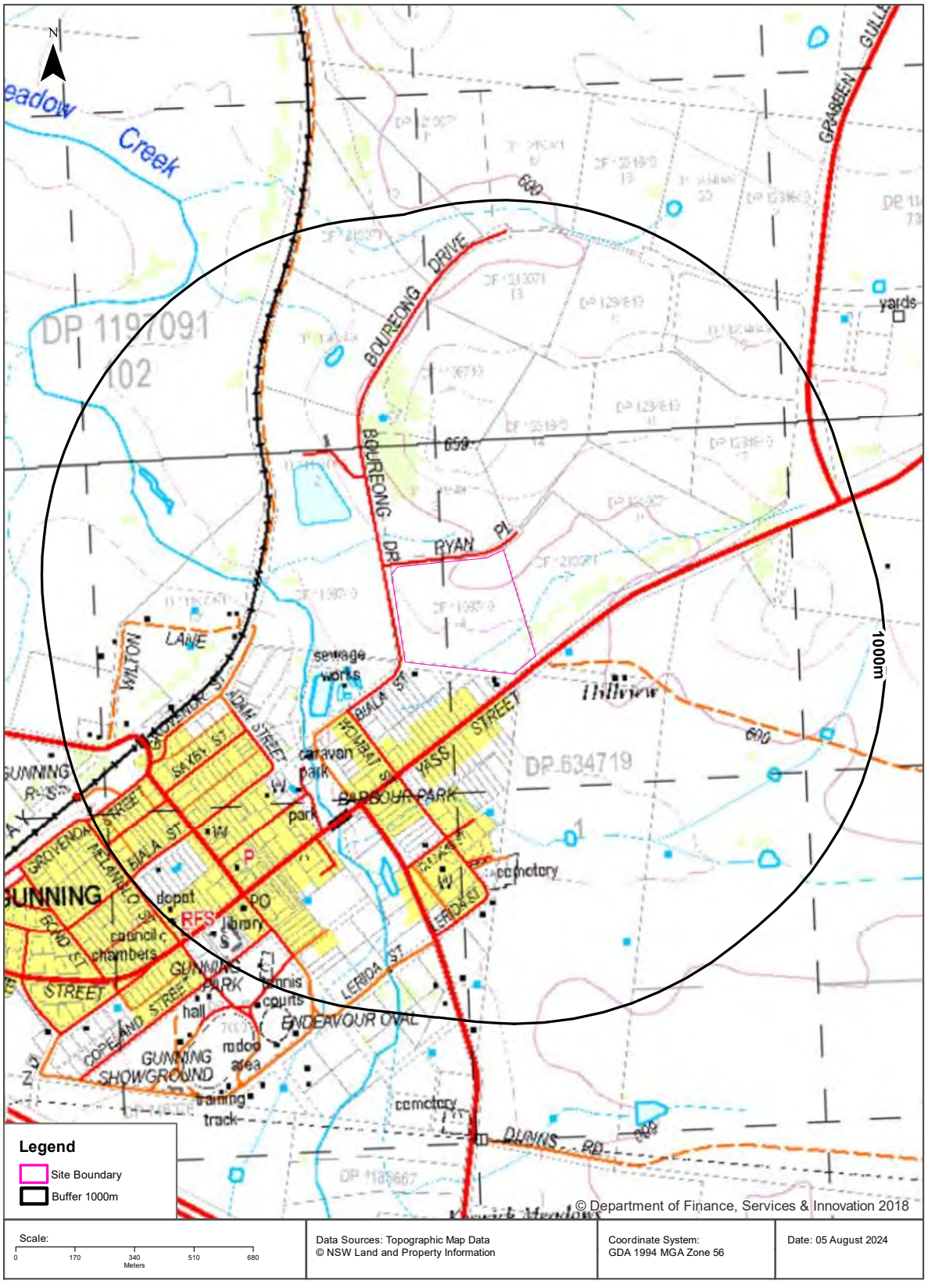
Aerial Imagery 1950

18 Boureong Drive, Gunning, NSW 2581



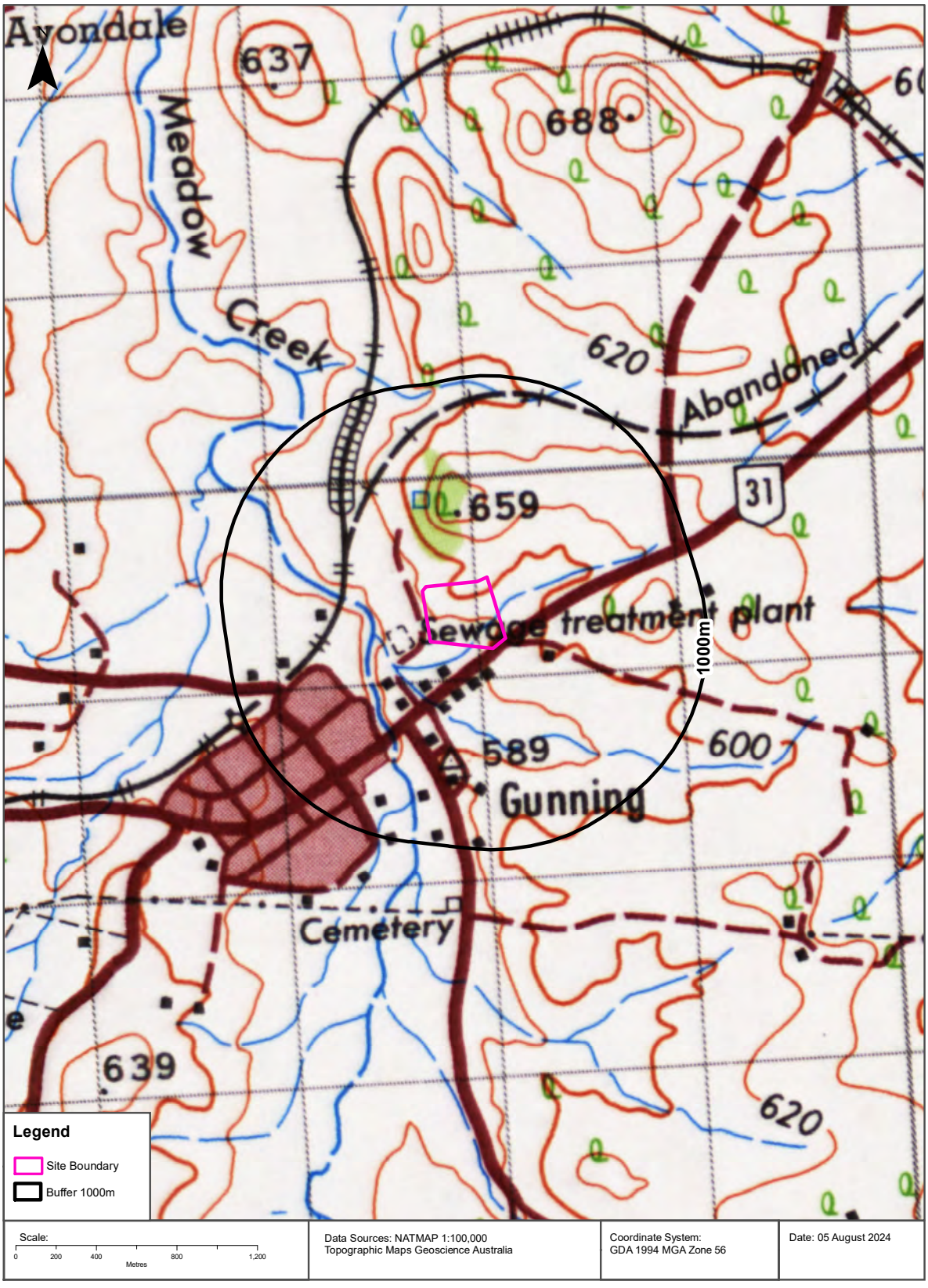
Topographic Map 2015

18 Boureong Drive, Gunning, NSW 2581



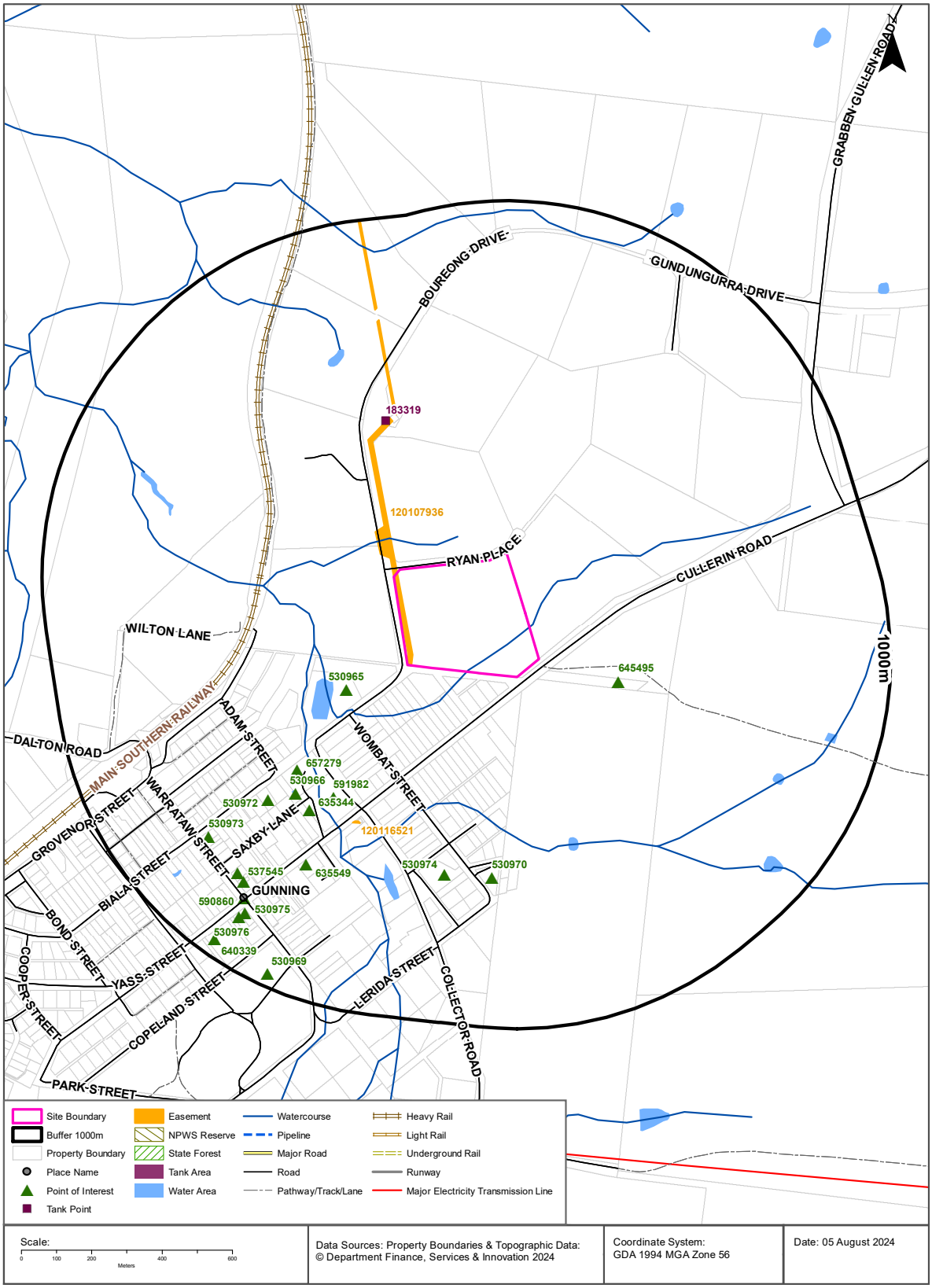
Historical Map 1973

18 Boureong Drive, Gunning, NSW 2581



Topographic Features

18 Boureong Drive, Gunning, NSW 2581



Topographic Features

18 Boureong Drive, Gunning, NSW 2581

Points of Interest

What Points of Interest exist within the dataset buffer?

Map Id	Feature Type	Label	Distance	Direction
530965	Sewage Works	Sewage Works	187m	South West
645495	Homestead	HILLVIEW	234m	East
591982	Park	BARBOUR PARK	432m	South West
657279	Tourist Park / Home Village	BARBOUR PARK	434m	South West
530966	Swimming Pool Facility	GUNNING SWIMMING POOL	485m	South West
635344	Park	Park	497m	South West
530972	Place Of Worship	ANGLICAN CHURCH	551m	South West
530970	Cemetery	GUNNING CEMETERY	576m	South
530974	Place Of Worship	CATHOLIC CHURCH	581m	South
635549	Tourist Information Centre	GUNNING SERVICE CENTRE AND VISITOR CENTRE	636m	South West
530973	Place Of Worship	UNITING CHURCH	747m	South West
537545	Police Station	GUNNING POLICE STATION	764m	South West
652314	Community Medical Centre	GUNNING DISTRICT COMMUNITY AND HEALTH SERVICE	773m	South West
590860	Town	GUNNING	809m	South West
530975	Post Office	GUNNING POST OFFICE	844m	South West
530976	Library	GUNNING LIBRARY	862m	South West
640339	Primary School	GUNNING PUBLIC SCHOOL	953m	South West
530969	Sports Court	TENNIS COURTS	964m	South West

Topographic Features

18 Boureong Drive, Gunning, NSW 2581

Tanks (Areas)

What are the Tank Areas located within the dataset buffer?
Note. The large majority of tank features provided by LPI are derived from aerial imagery & are therefore primarily above ground tanks.

Map Id	Tank Type	Status	Name	Feature Currency	Distance	Direction
N/A	No records in buffer					

Tanks (Points)

What are the Tank Points located within the dataset buffer?
Note. The large majority of tank features provided by LPI are derived from aerial imagery & are therefore primarily above ground tanks.

Map Id	Tank Type	Status	Name	Feature Currency	Distance	Direction
183319	Water	Operational		01/11/2014	424m	North

Major Easements

What Major Easements exist within the dataset buffer?
Note. Easements provided by LPI are not at the detail of local governments. They are limited to major easements such as Right of Carriageway, Electrical Lines (66kVa etc.), Easement to drain water & Significant subterranean pipelines (gas, water etc.).

Map Id	Easement Class	Easement Type	Easement Width	Distance	Direction
120107936	Primary	Undefined		0m	On-site
120116521	Primary	Undefined		465m	South West

Topographic Features

18 Boureong Drive, Gunning, NSW 2581

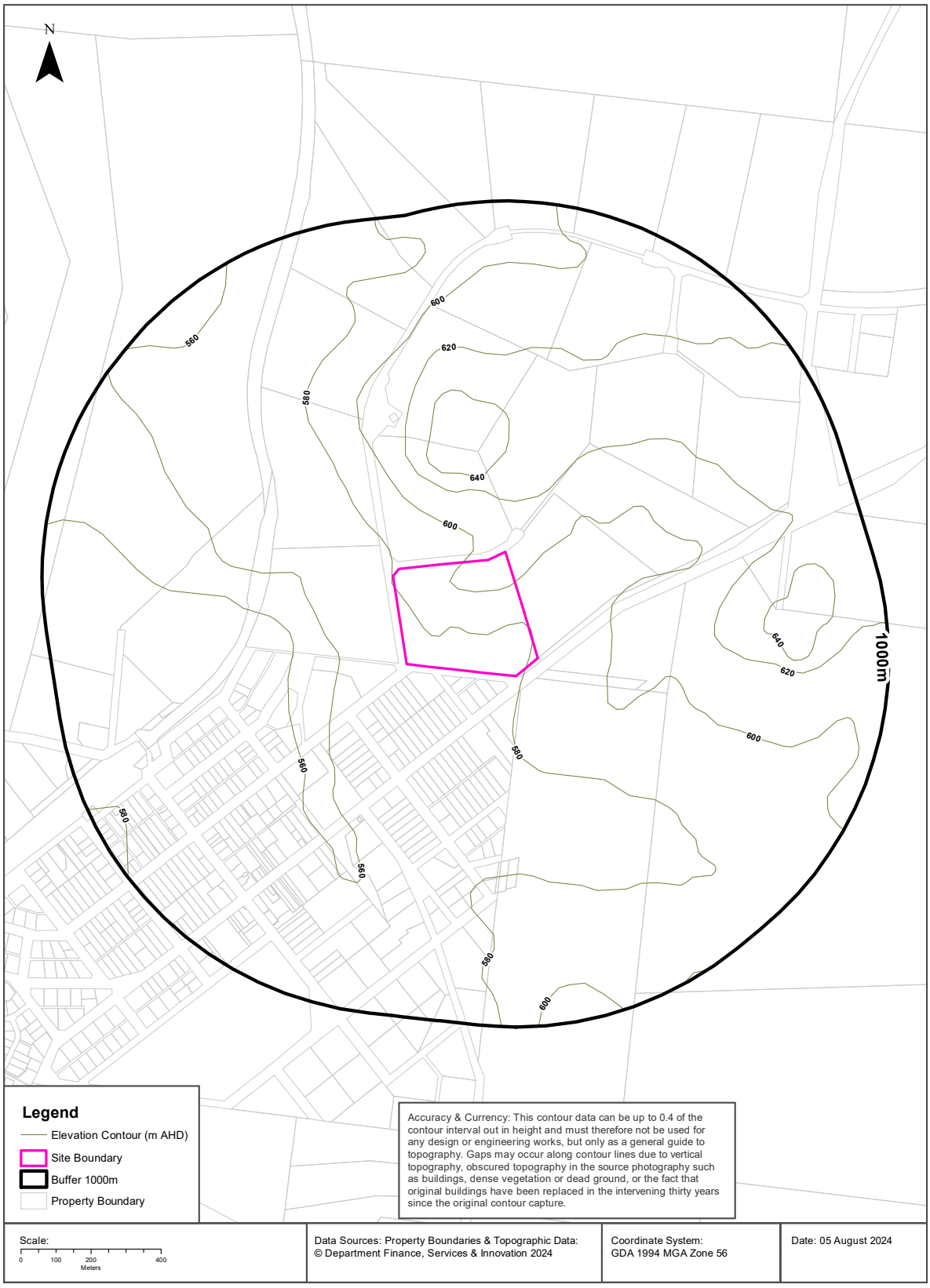
State Forest

What State Forest exist within the dataset buffer?

State Forest Number	State Forest Name	Distance	Direction
N/A	No records in buffer		

Elevation Contours (m AHD)

18 Boureong Drive, Gunning, NSW 2581



Hydrogeology & Groundwater

18 Boureong Drive, Gunning, NSW 2581

Hydrogeology

Description of aquifers within the dataset buffer:

Description	Distance	Direction
Fractured or fissured, extensive aquifers of low to moderate productivity	0m	On-site

Hydrogeology Map of Australia : Commonwealth of Australia (Geoscience Australia)

Temporary Water Restriction (Botany Sands Groundwater Source) Order 2018

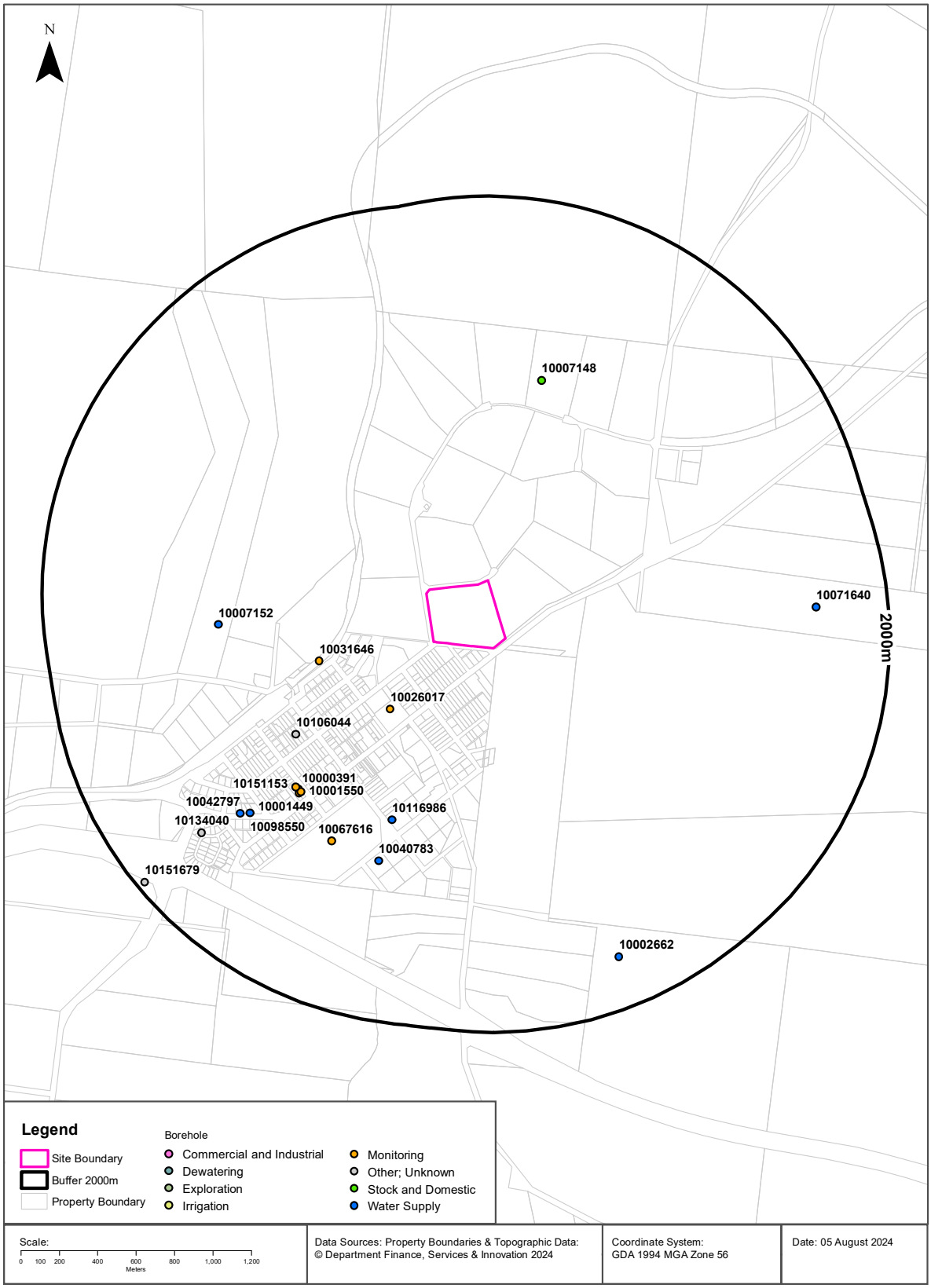
Temporary water restrictions relating to the Botany Sands aquifer within the dataset buffer:

Prohibition Area No.	Prohibition	Distance	Direction
N/A	No records in buffer		

Temporary Water Restriction (Botany Sands Groundwater Source) Order 2018 Data Source : NSW Department of Primary Industries

Groundwater Boreholes

18 Boureong Drive, Gunning, NSW 2581



Hydrogeology & Groundwater

18 Boureong Drive, Gunning, NSW 2581

Groundwater Boreholes

Boreholes within the dataset buffer:

NGIS Bore ID	NSW Bore ID	Bore Type	Status	Drill Date	Bore Depth (m)	Reference Elevation	Height Datum	Salinity (mg/L)	Yield (L/s)	SWL (mbgl)	Distance	Direction
10026017	GW703270	Monitoring	Abandoned	06/06/2007	64.00		AHD				418m	South West
10031646	GW703269	Monitoring	Abandoned	29/05/2007	80.00		AHD				604m	West
10106044	GW015930	Other	Unknown	01/06/1957	30.50		AHD	Good			864m	South West
10116986	GW058346	Water Supply	Unknown	01/10/1983	43.60		AHD	Good			952m	South
10000391	GW704875	Monitoring	Functional	29/09/2011	7.70		AHD			6.23	1040m	South West
10151153	GW704876	Monitoring	Functional	29/09/2011	8.80		AHD			7.56	1042m	South West
10001550	GW704874	Monitoring	Functional	29/09/2011	7.30		AHD			5.75	1043m	South West
10001449	GW704877	Monitoring	Functional	29/09/2011	6.00		AHD				1054m	South West
10007148	GW705197	Stock and Domestic	Functioning	06/02/2018	84.00		AHD				1077m	North
10007152	GW029031	Water Supply	Unknown	01/04/1968	24.70		AHD				1093m	West
10067616	GW703530	Monitoring	Functioning	05/06/2007	32.00		AHD		2.527	2.00	1164m	South West
10040783	GW703475	Water Supply	Functioning	27/03/2009	11.00		AHD			3.00	1177m	South
10098550	GW015919	Water Supply	Unknown	01/07/1957	22.90		AHD				1308m	South West
10042797	GW016655	Water Supply	Unknown	01/07/1957	30.80		AHD	Good			1347m	South West
10134040	GW068503	Unknown	Unknown	20/02/1991	48.00		AHD	Good	1.100	18.00	1564m	South West
10071640	GW703429	Water Supply	Functioning	01/12/2006	51.00		AHD	Good		19.00	1626m	East
10002662	GW704952	Water Supply	Proposed	24/03/2011	30.00		AHD				1734m	South East
10151679	GW020957	Unknown	Unknown	01/05/1955	70.10		AHD				1957m	South West

Hydrogeology & Groundwater

18 Boureong Drive, Gunning, NSW 2581

Driller's Logs

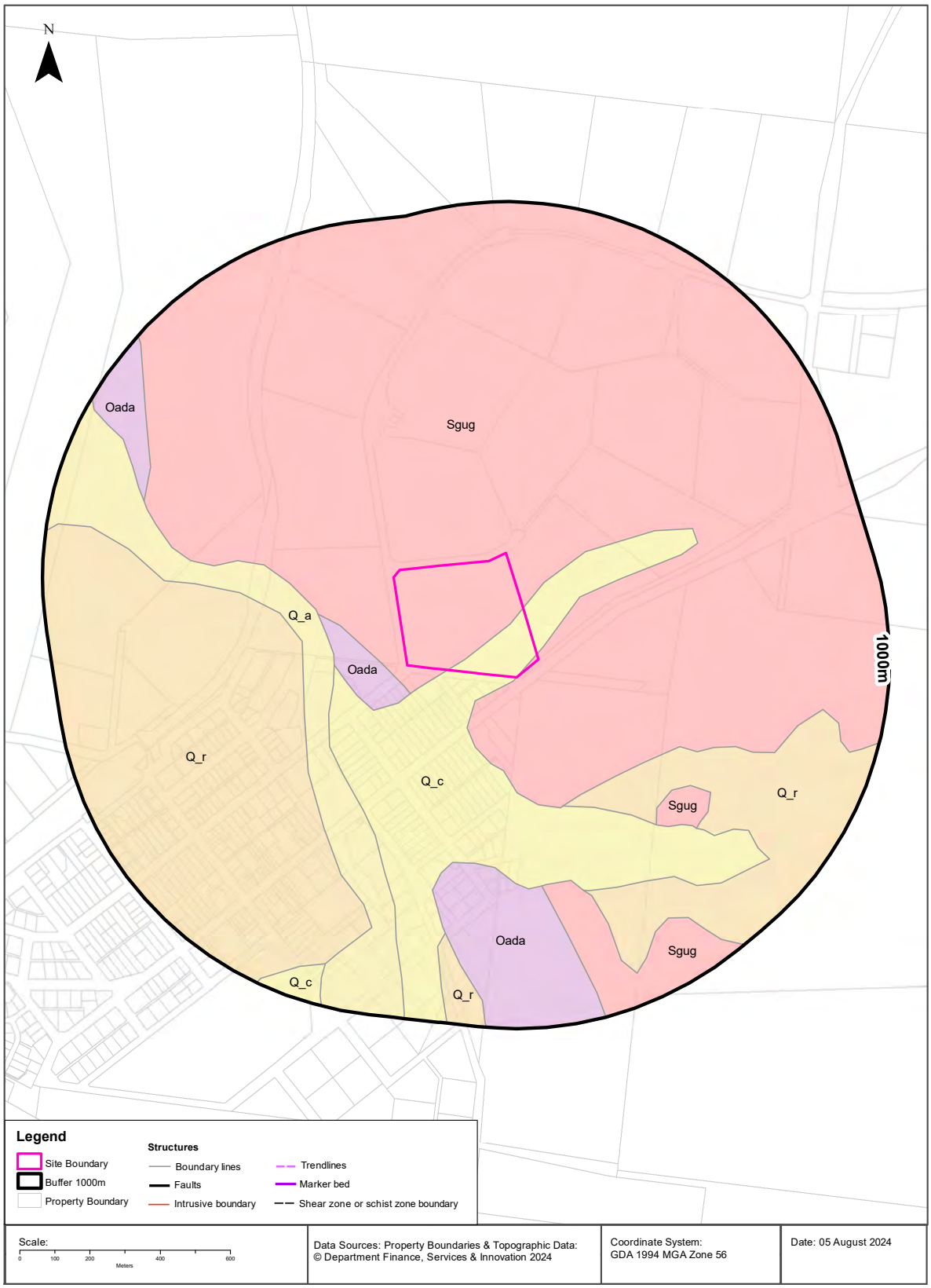
Drill log data relevant to the boreholes within the dataset buffer:

NGIS Bore ID	Drillers Log	Distance	Direction
10026017	0.00m-1.00m Topsoil 1.00m-4.00m Clay 4.00m-9.00m Shale, soft 9.00m-64.00m Granite	418m	South West
10031646	0.00m-1.00m Topsoil 1.00m-6.00m Clay 6.00m-11.00m Shale, soft 11.00m-80.00m Basalt	604m	West
10106044	0.00m-1.83m Clay 1.83m-15.24m Shale 15.24m-26.82m Shale Green Sandy Quartzite Water Supply 26.82m-30.48m Porphyry	864m	South West
10116986	0.00m-1.60m Topsoil 1.60m-4.80m Sand Clay 4.80m-6.30m Boulders 6.30m-16.70m Sandstone Cemented 16.70m-17.20m Shale Hard 17.20m-43.60m Shale Grey Hard Water Supply	952m	South
10000391	0.00m-0.80m Fill; Sand, brown 0.80m-1.40m Sandy Clay; yellow brown 1.40m-3.80m Silty Clay; brown 3.80m-4.60m Sandy Clay; red brown 4.60m-7.70m Silty Clay; yellow brown	1040m	South West
10151153	0.00m-0.60m Fill; Silty Sand, brown 0.60m-2.20m Silty Clay; yellow brown 2.20m-2.60m Silty Sand; brown 2.60m-8.80m Sandy Clay; yellow brown	1042m	South West
10001550	0.00m-0.80m Fill; silty sand, brown 0.80m-1.20m Silt; brown 1.20m-1.80m Sandy Clay; red brown 1.80m-4.00m Sandy Clay; yellow brown 4.00m-5.20m Silty Clay; yellow brown 5.20m-6.20m Sand; brown 6.20m-6.80m Silty Clay; yellow brown 6.80m-7.30m Sand; pale brown	1043m	South West
10001449	0.00m-1.40m Gravel, Sandy; grey brown 1.40m-5.60m Silty Clay; brown 5.60m-6.00m Gravel, Silty; brown	1054m	South West
10007152	0.00m-3.96m Clay Sand 3.96m-24.69m Granite Decomposed Water Supply	1093m	West
10067616	0.00m-1.00m topsoil 1.00m-4.00m clay 4.00m-8.00m sand and gravel 8.00m-15.00m soft shale 15.00m-32.00m shale	1164m	South West
10098550	0.00m-9.14m Shale Yellow 9.14m-22.86m Quartzite White	1308m	South West
10042797	0.00m-30.78m Granite Decomposed Mixed Water Supply 0.00m-30.78m Quartzite White	1347m	South West
10134040	0.00m-23.00m DECOMPOSED GRANITE 23.00m-48.00m GRANITE	1564m	South West
10002662	0.00m-3.00m Topsoil 3.00m-30.00m Granite	1734m	South East

NGIS Bore ID	Drillers Log	Distance	Direction
10151679	0.00m-4.27m Clay Sandy 4.27m-6.10m Clay Some Gravel 6.10m-18.29m Clay Gritty 18.29m-24.69m Clay Yellow Some Hard Bands 24.69m-27.43m Clay Yellow 27.43m-33.53m Clay Yellow Sandy 33.53m-35.05m Clay Pink 35.05m-49.38m Sandstone Coarse 49.38m-52.73m Clay Sandy Fretting 52.73m-63.09m Sandstone Soft Water Supply 63.09m-64.01m Sandstone 64.01m-70.10m Clay Sandy	1957m	South West

Geology

18 Boureong Drive, Gunning, NSW 2581



Geology

18 Boureong Drive, Gunning, NSW 2581

Geological Units

What are the Geological Units within the dataset buffer?

Unit Code	Unit Name	Description	Unit Stratigraphy	Age	Dominant Lithology	Distance
Sgug	Gunning Granite	Grey to cream, medium- to coarse-grained, equigranular to porphyritic, hornblende-biotite granite, granodiorite and lesser tonalite; dark grey ovoid microdioritic enclaves and clots; granite is strongly schistose along the eastern margin.	\Gunning Suite\\Gunning Granite\\	Aeronian (base) to Aeronian (top)	Granite	0m
Q_c	Colluvium	Poorly sorted, weakly cemented to unconsolidated colluvial lenses of polymictic conglomerate with medium- to very coarse-grained sand matrix; interspersed with unconsolidated clayey and silty red-brown (aeolian) sand layers, modified by pedogenesis.	\Colluvium\\\\	Quaternary (base) to Now (top)	Clastic sediment	0m
Oada	Abercrombie Formation	Brown and buff to grey, thin- to thick-bedded, fine- to coarse-grained mica-quartz (±feldspar) sandstone, interbedded with laminated siltstone and mudstone. Sporadic chert-rich units.	\Adaminaby Group\ \Abercrombie Formation\ \	La2b (Lancefieldian) (base) to Da4 (Darriwilian) (top)	Sandstone	47m
Q_a	Alluvium	Unconsolidated grey to brown to beige humic (±)micaceous silty clay, quartz-(±)lithic silt, fine- to medium-grained quartz-rich to quartz-lithic sand, polymictic pebble to cobble gravel (as sporadic lenses); sporadic palaeosol horizons.	\Alluvium\\\\	Quaternary (base) to Now (top)	Clastic sediment	201m
Q_r	Residual deposits	A weakly-consolidated regolithic residuum such as soil or saprolite mostly developed in-situ as a result of advanced weathering and/or pedogenesis.	\Residual deposits\\\\	Quaternary (base) to Now (top)	Saprolite	286m

Linear Geological Structures

What are the Dyke, Sill, Fracture, Lineament and Vein trendlines within the dataset buffer?

Map ID	Feature Description	Map Sheet Name	Distance
No Features			

What are the Faults, Shear zones or Schist zones, Intrusive boundaries & Marker beds within the dataset buffer?

Map ID	Boundary Type	Description	Map Sheet Name	Distance
No Features				

Naturally Occurring Asbestos Potential

18 Boureong Drive, Gunning, NSW 2581

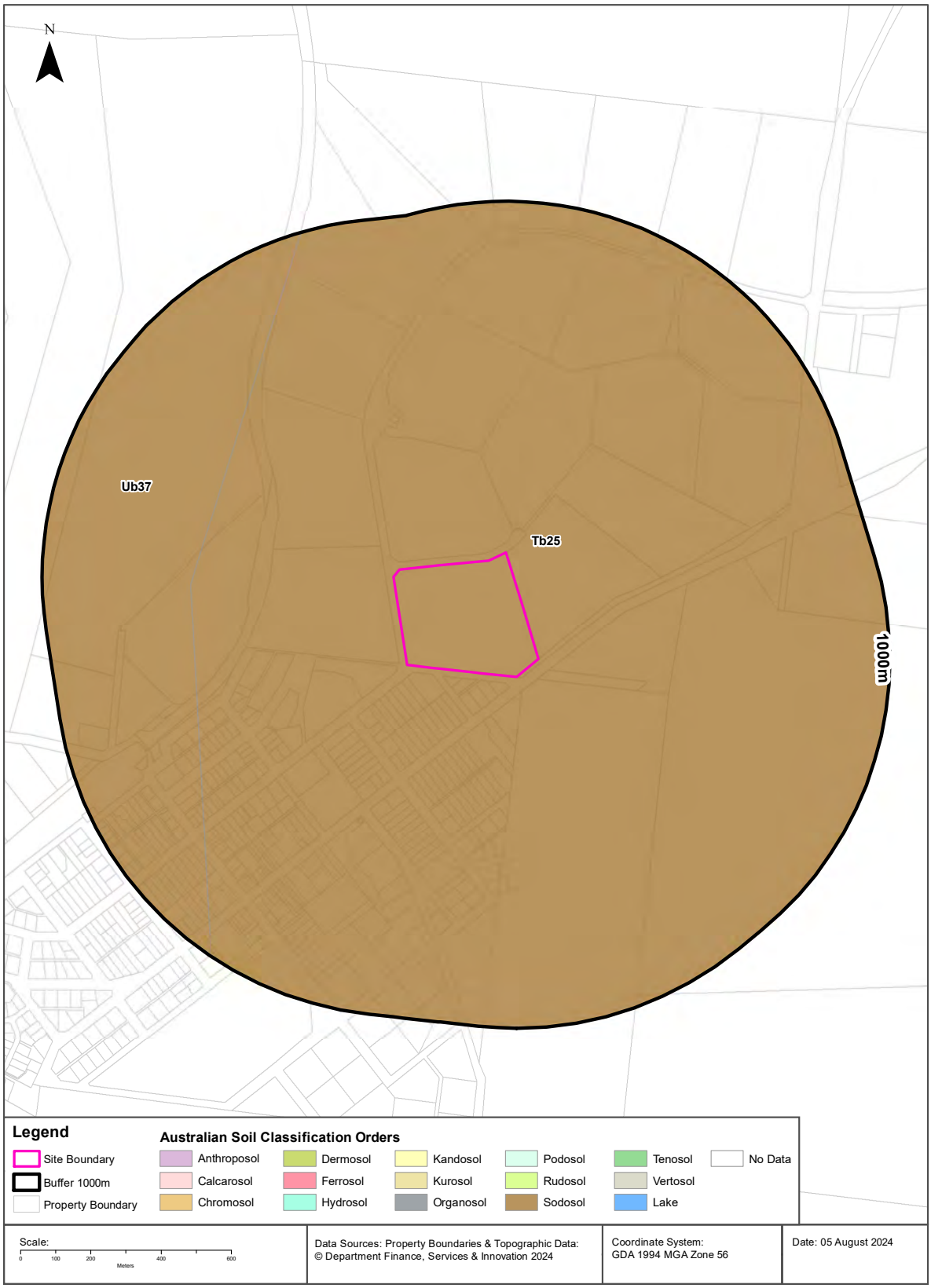
Naturally Occurring Asbestos Potential

Naturally Occurring Asbestos Potential within the dataset buffer:

Potential	Sym	Strat Name	Group	Formation	Scale	Min Age	Max Age	Rock Type	Dom Lith	Description	Dist	Dir
No records in buffer												

Atlas of Australian Soils

18 Boureong Drive, Gunning, NSW 2581



Soils

18 Boureong Drive, Gunning, NSW 2581

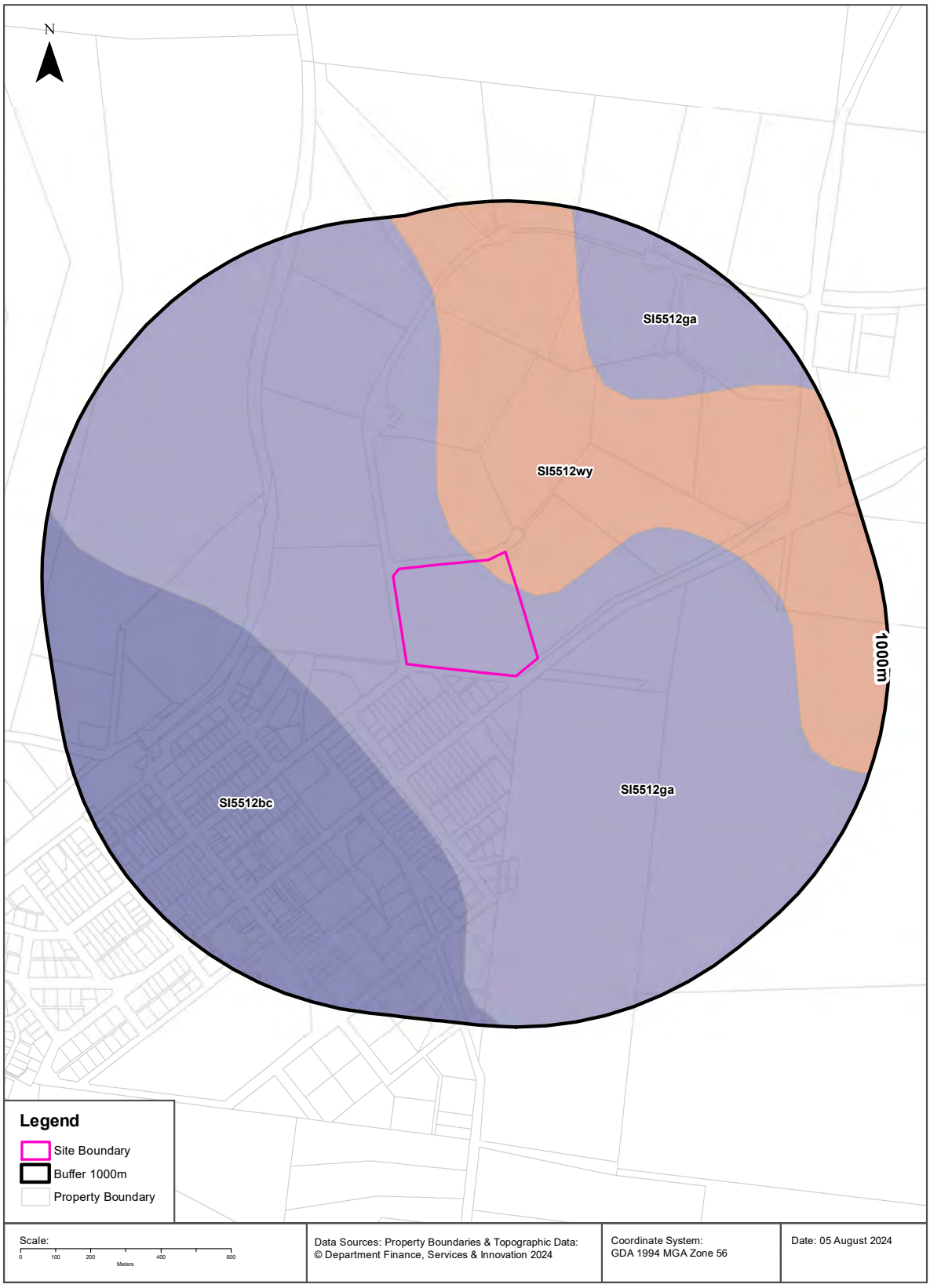
Atlas of Australian Soils

Soil mapping units and Australian Soil Classification orders within the dataset buffer:

Map Unit Code	Soil Order	Map Unit Description	Distance	Direction
Tb25	Sodosol	Dissected plateau tracts--undulating to hilly country, tors common: chief soils are hard acidic and neutral yellow and yellow mottled soils (Dy3.41), (Dy3.42), and (Dy2.21). Associated are: hard acidic and neutral red soils (Dr2.2) and (Dr2.4); some siliceous sands (Uc1.2) on colluvial deposits; and small areas of unit Mu7. Data are limited.	0m	On-site
Ub37	Sodosol	Areas of subdued relief: plains or very gently sloping basins of hard neutral yellow mottled soils (Dy3.42) separated by rolling areas, ridges, and hills of unit Ub31 soils, especially the (Dr2.22), (Dr3.42), and (Um4) soils, and traversed by stream valleys of variable width and development as for stream terraces of unit Mu4.	545m	West

Soil Landscapes of Central and Eastern NSW

18 Boureong Drive, Gunning, NSW 2581



Soils

18 Boureong Drive, Gunning, NSW 2581

Soil Landscapes of Central and Eastern NSW

Soil Landscapes of Central and Eastern NSW within the dataset buffer:

Soil Code	Name	Distance	Direction
SI5512ga	Garland	0m	On-site
SI5512wy	Wyangala	0m	On-site
SI5512bc	Blakney Creek	253m	South West

Acid Sulfate Soils

18 Boureong Drive, Gunning, NSW 2581

Environmental Planning Instrument - Acid Sulfate Soils

What is the on-site Acid Sulfate Soil Plan Class that presents the largest environmental risk?

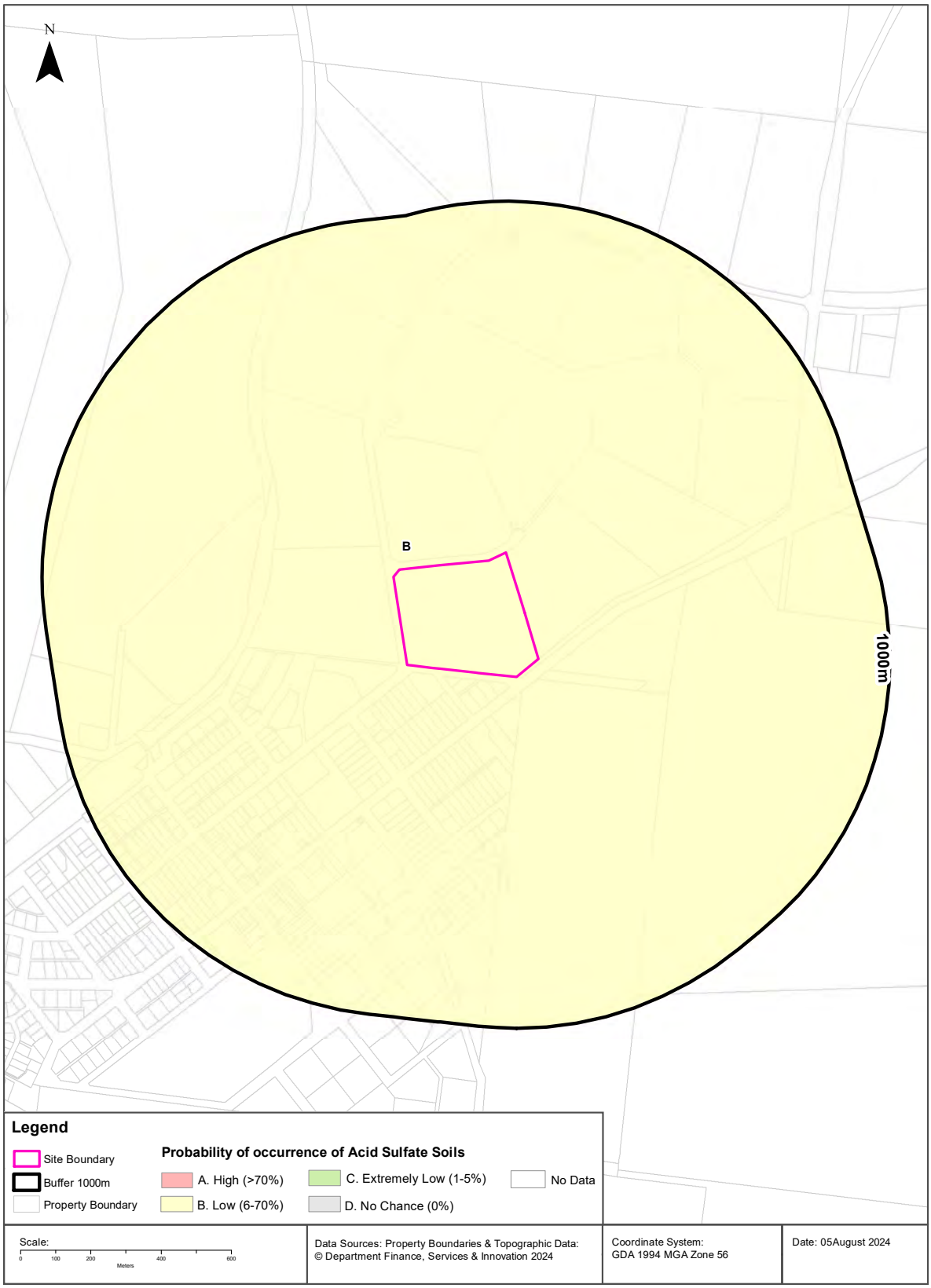
Soil Class	Description	EPI Name
N/A		

If the on-site Soil Class is 5, what other soil classes exist within 500m?

Soil Class	Description	EPI Name	Distance	Direction
N/A				

Atlas of Australian Acid Sulfate Soils

18 Boureong Drive, Gunning, NSW 2581



Acid Sulfate Soils

18 Boureong Drive, Gunning, NSW 2581

Atlas of Australian Acid Sulfate Soils

Atlas of Australian Acid Sulfate Soil categories within the dataset buffer:

Class	Description	Distance	Direction
B	Low Probability of occurrence. 6-70% chance of occurrence.	0m	On-site

Dryland Salinity

18 Boureong Drive, Gunning, NSW 2581

Dryland Salinity - National Assessment

Is there Dryland Salinity - National Assessment data onsite?

No

Is there Dryland Salinity - National Assessment data within the dataset buffer?

No

What Dryland Salinity assessments are given?

Assessment 2000	Assessment 2020	Assessment 2050	Distance	Direction
N/A	N/A	N/A		

Dryland Salinity Data Source : National Land and Water Resources Audit
The Commonwealth and all suppliers of source data used to derive the maps of "Australia, Forecast Areas Containing Land of High Hazard or Risk of Dryland Salinity from 2000 to 2050" do not warrant the accuracy or completeness of information in this product. Any person using or relying upon such information does so on the basis that the Commonwealth and data suppliers shall bear no responsibility or liability whatsoever for any errors, faults, defects or omissions in the information. Any persons using this information do so at their own risk.
In many cases where a high risk is indicated, less than 100% of the area will have a high hazard or risk.

Mining

18 Boureong Drive, Gunning, NSW 2581

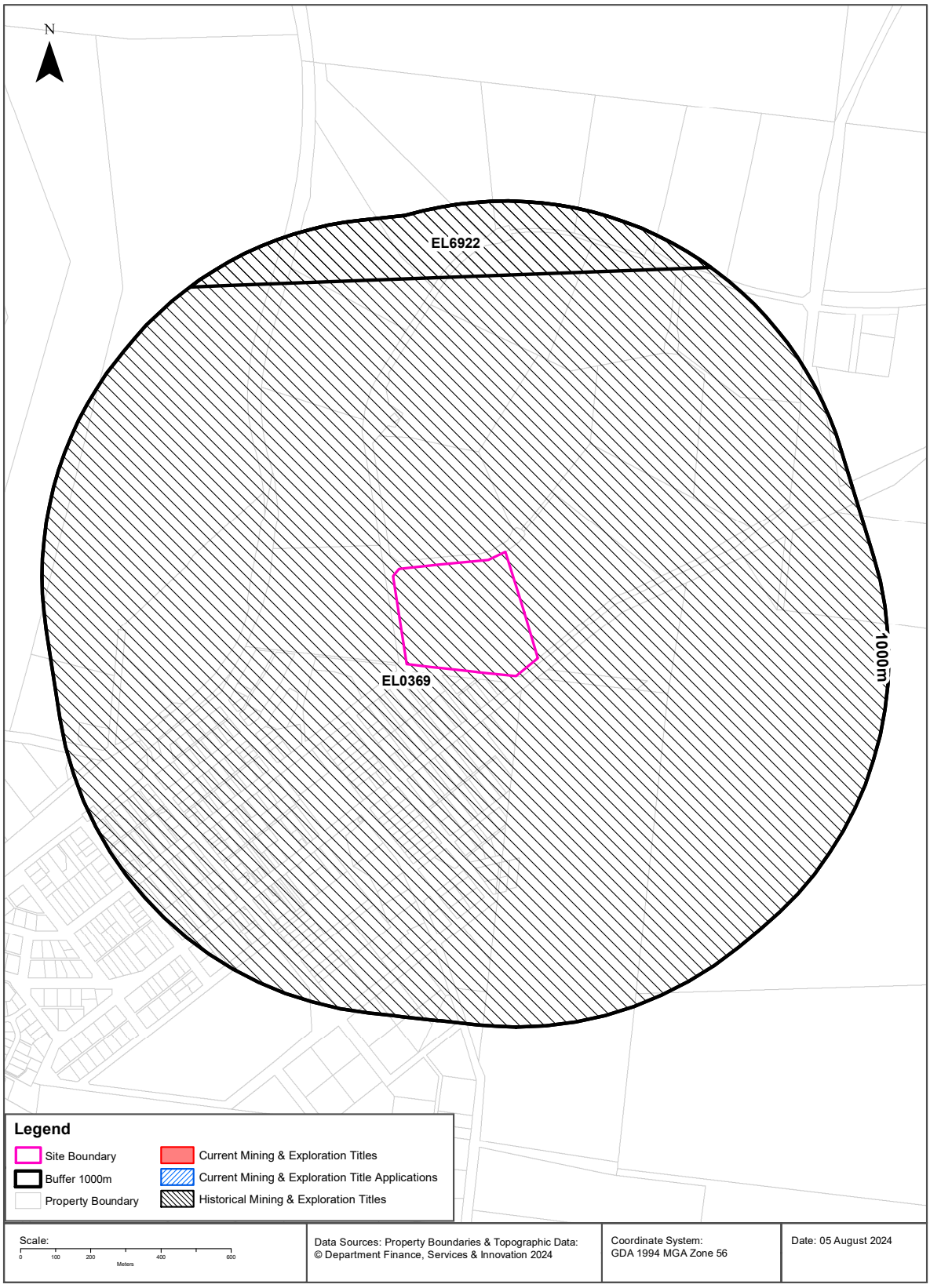
Mining Subsidence Districts

Mining Subsidence Districts within the dataset buffer:

District	Distance	Direction
There are no Mining Subsidence Districts within the report buffer		

Mining & Exploration Titles

18 Boureong Drive, Gunning, NSW 2581



Mining

18 Boureong Drive, Gunning, NSW 2581

Current Mining & Exploration Titles

Current Mining & Exploration Titles within the dataset buffer:

Title Ref	Holder	Grant Date	Expiry Date	Last Renewed	Operation	Resource	Minerals	Dist	Dir
N/A	No records in buffer								

Current Mining & Exploration Titles Data Source: © State of New South Wales through NSW Department of Industry

Current Mining & Exploration Title Applications

Current Mining & Exploration Title Applications within the dataset buffer:

Application Ref	Applicant	Application Date	Operation	Resource	Minerals	Dist	Dir
N/A	No records in buffer						

Current Mining & Exploration Title Applications Data Source: © State of New South Wales through NSW Department of Industry

Mining

18 Boureong Drive, Gunning, NSW 2581

Historical Mining & Exploration Titles

Historical Mining & Exploration Titles within the dataset buffer:

Title Ref	Holder	Start Date	End Date	Resource	Minerals	Dist	Dir
EL0369	WAITOVU INVESTMENTS PTY LIMITED	19701201	19711201	MINERALS	Cu Pb Zn	0m	On-site
EL6922	GOLD MOUNTAIN LIMITED	20071024	20170705	MINERALS	Au	788m	North

State Environmental Planning Policy

18 Boureong Drive, Gunning, NSW 2581

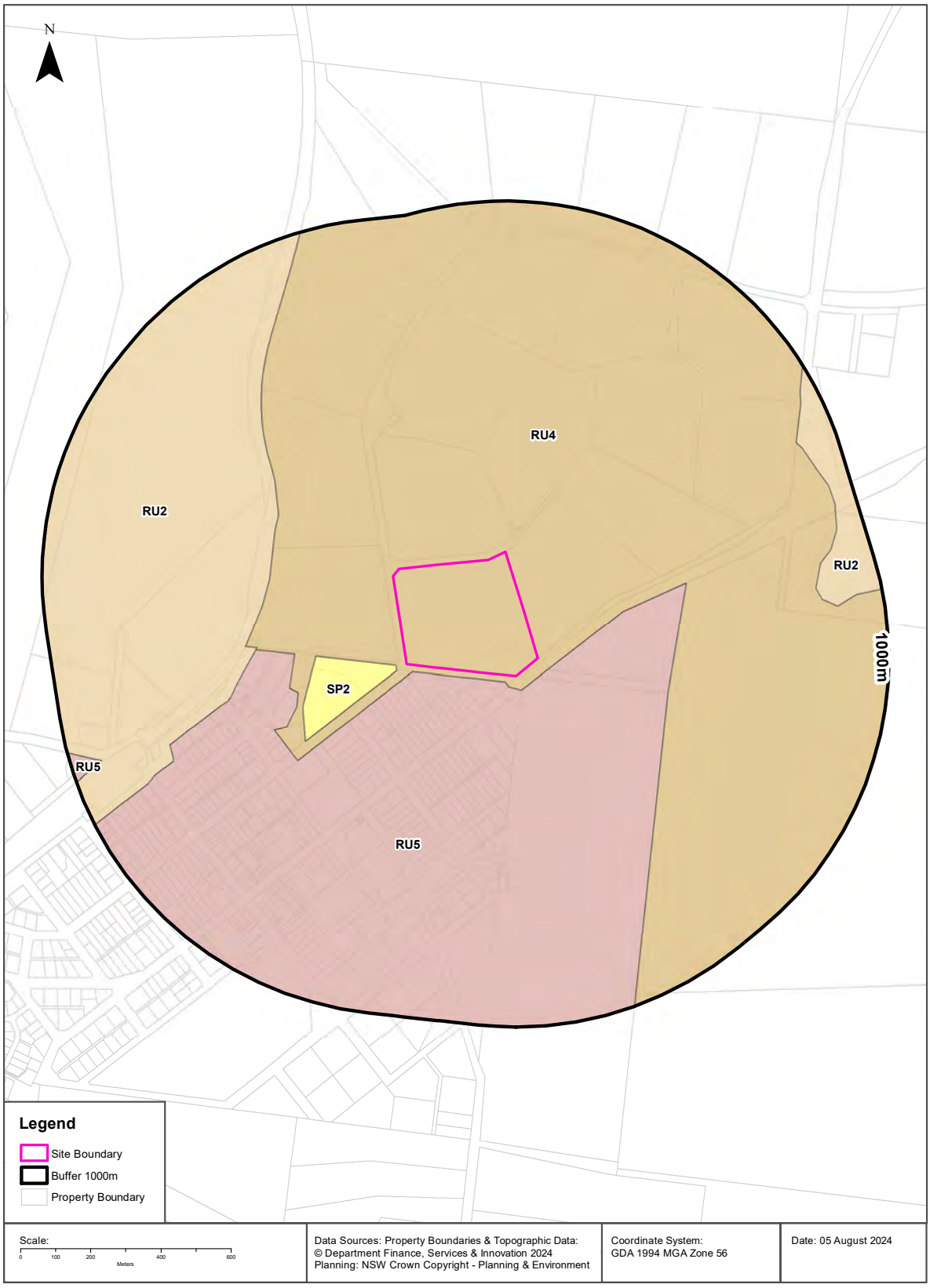
State Significant Precincts

What SEPP State Significant Precincts exist within the dataset buffer?

Map Id	Precinct	EPI Name	Published Date	Commenced Date	Currency Date	Amendment	Distance	Direction
N/A	No records in buffer							

EPI Planning Zones

18 Boureong Drive, Gunning, NSW 2581



Environmental Planning Instrument

18 Boureong Drive, Gunning, NSW 2581

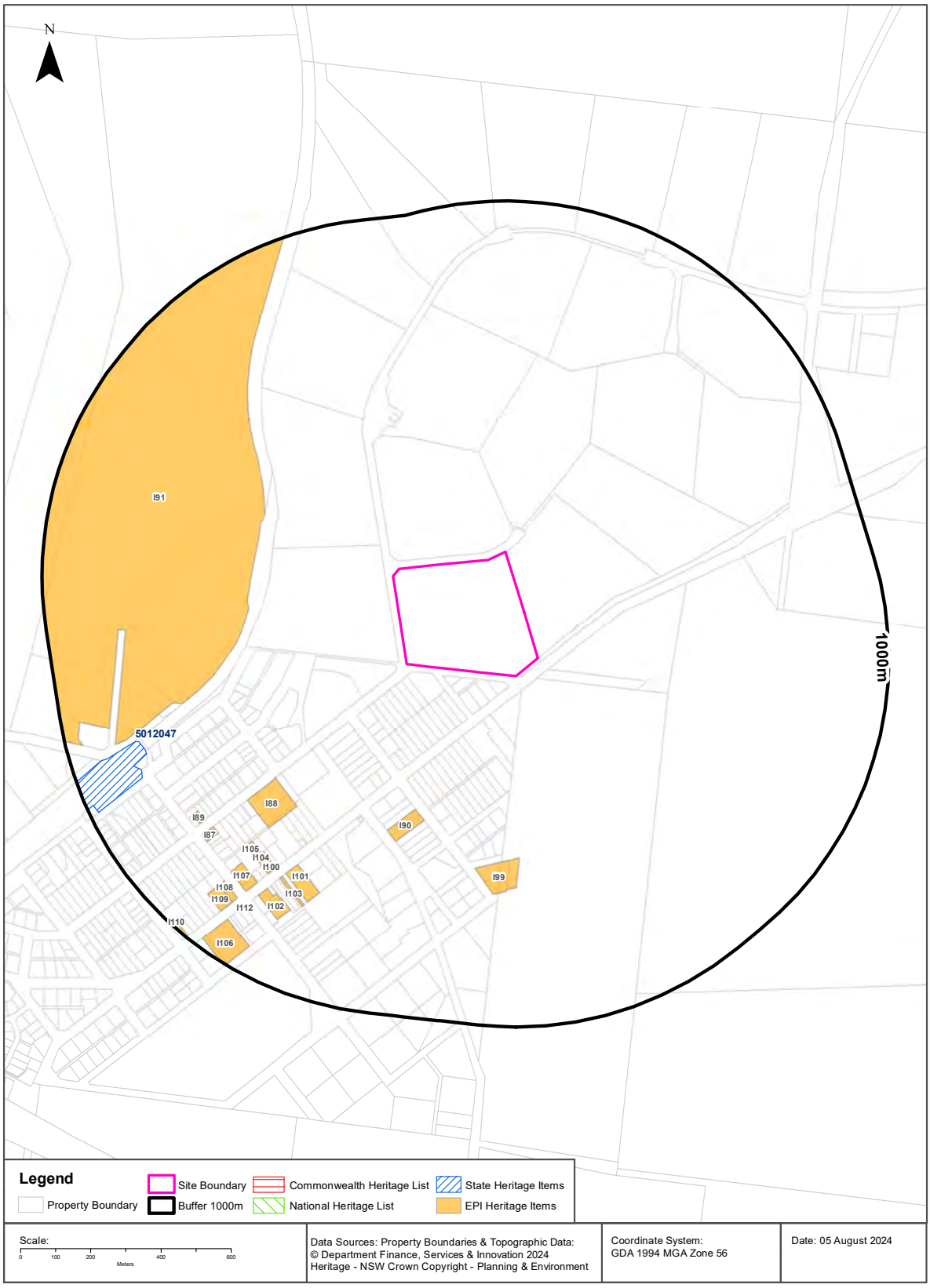
Land Zoning

What EPI Land Zones exist within the dataset buffer?

Zone	Description	Purpose	EPI Name	Published Date	Commenced Date	Currency Date	Amendment	Distance	Direction
RU4	Primary Production Small Lots		Upper Lachlan Local Environmental Plan 2010	14/04/2023	26/04/2023	26/04/2023	Map Amendment No 2	0m	On-site
RU5	Village		Upper Lachlan Local Environmental Plan 2010	14/04/2023	26/04/2023	26/04/2023	Map Amendment No 2	20m	South
SP2	Infrastructure	Sewerage Treatment Facility	Upper Lachlan Local Environmental Plan 2010	14/04/2023	26/04/2023	26/04/2023	Map Amendment No 2	33m	South West
RU2	Rural Landscape		Upper Lachlan Local Environmental Plan 2010	14/04/2023	26/04/2023	26/04/2023	Map Amendment No 2	349m	West
RU5	Village		Upper Lachlan Local Environmental Plan 2010	14/04/2023	26/04/2023	26/04/2023	Map Amendment No 2	913m	West

Heritage Items

18 Boureong Drive, Gunning, NSW 2581



Heritage

18 Boureong Drive, Gunning, NSW 2581

Commonwealth Heritage List

What are the Commonwealth Heritage List Items located within the dataset buffer?

Place Id	Name	Address	Place File No	Class	Status	Register Date	Distance	Direction
N/A	No records in buffer							

National Heritage List

What are the National Heritage List Items located within the dataset buffer?
Note. Please click on Place Id to activate a hyperlink to online website.

Place Id	Name	Address	Place File No	Class	Status	Register Date	Distance	Direction
N/A	No records in buffer							

State Heritage Register - Curtilages

What are the State Heritage Register Items located within the dataset buffer?

Map Id	Name	Address	LGA	Listing Date	Listing No	Plan No	Distance	Direction
5012047	Gunning Railway Station and yard group	Main Southern railway Gunning	UPPER LACHLAN SHIRE	02/04/1999	01162	2724	783m	South West

Environmental Planning Instrument - Heritage

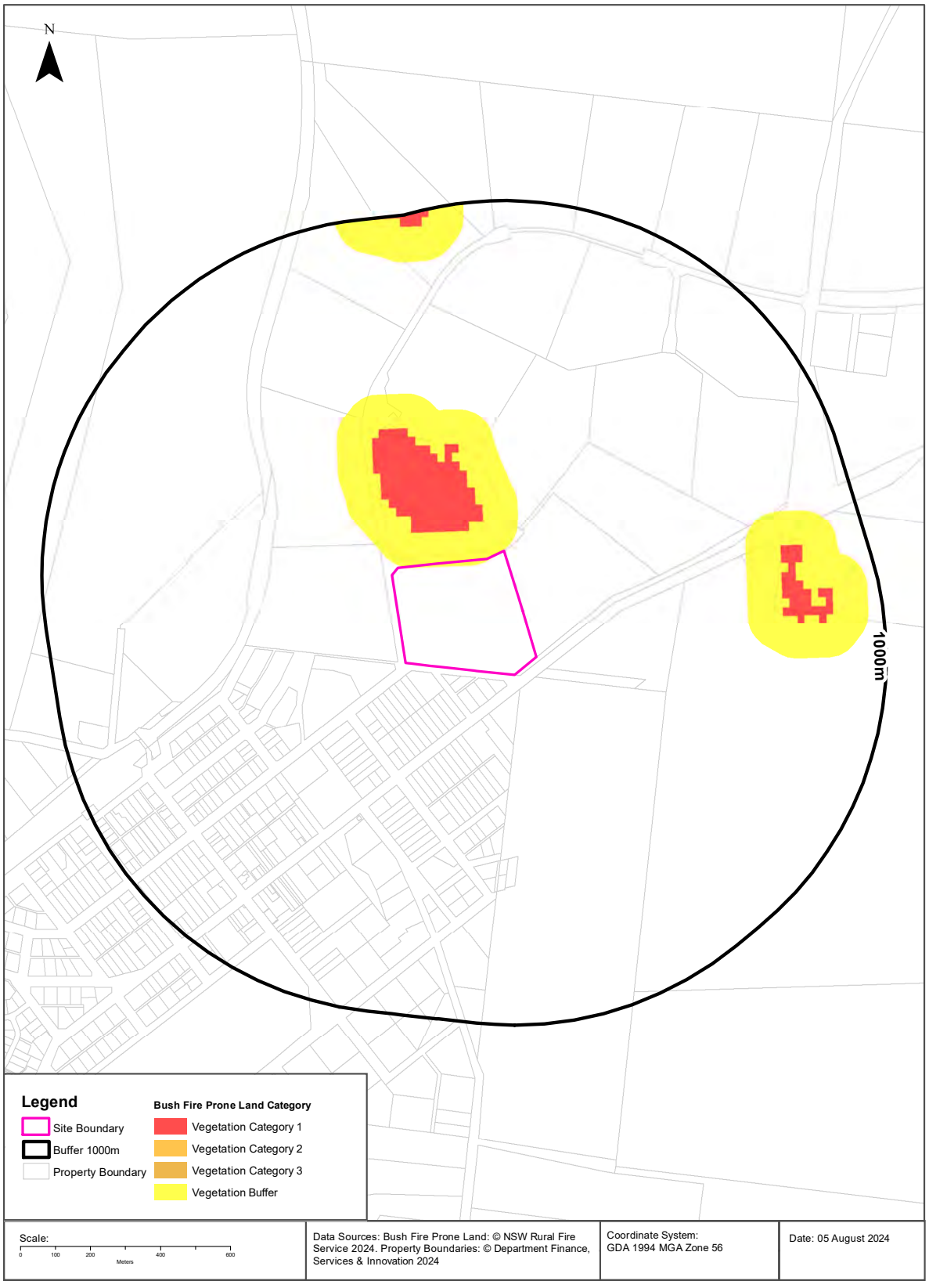
What are the EPI Heritage Items located within the dataset buffer?

Map Id	Name	Classification	Significance	EPI Name	Published Date	Commenced Date	Currency Date	Distance	Direction
I91	Boureong	Item - General	Local	Upper Lachlan Local Environmental Plan 2010	09/07/2010	09/07/2010	09/11/2012	397m	West
I90	Cottage	Item - General	Local	Upper Lachlan Local Environmental Plan 2010	09/07/2010	09/07/2010	09/11/2012	407m	South
I88	St Edmund's Uniting Church and Rectory	Item - General	Local	Upper Lachlan Local Environmental Plan 2010	09/11/2012	09/11/2012	09/11/2012	495m	South West

Map Id	Name	Classification	Significance	EPI Name	Published Date	Commenced Date	Currency Date	Distance	Direction
I99	Gunning General Cemetery	Item - General	Local	Upper Lachlan Local Environmental Plan 2010	09/11/2012	09/11/2012	09/11/2012	518m	South
I101	Hotel Group, consisting of Telegraph Hotel	Item - General	Local	Upper Lachlan Local Environmental Plan 2010	09/07/2010	09/07/2010	09/11/2012	650m	South West
I104	Double storey terrace known as 'Caxton House'	Item - General	Local	Upper Lachlan Local Environmental Plan 2010	09/07/2010	09/07/2010	09/11/2012	671m	South West
I100	Single storey shop	Item - General	Local	Upper Lachlan Local Environmental Plan 2010	09/07/2010	09/07/2010	09/11/2012	673m	South West
I105	Single storey shop known as 'Caxton Cottage '	Item - General	Local	Upper Lachlan Local Environmental Plan 2010	09/07/2010	09/07/2010	09/11/2012	682m	South West
I103	London House	Item - General	Local	Upper Lachlan Local Environmental Plan 2010	09/07/2010	09/07/2010	09/11/2012	701m	South West
I87	Anglican Church and surrounding church buildings	Item - General	Local	Upper Lachlan Local Environmental Plan 2010	09/11/2012	09/11/2012	09/11/2012	720m	South West
I89	Masonic Temple [former]	Item - General	Local	Upper Lachlan Local Environmental Plan 2010	09/07/2010	09/07/2010	09/11/2012	726m	South West
I107	Court House, Police Station	Item - General	Local	Upper Lachlan Local Environmental Plan 2010	09/07/2010	09/07/2010	09/11/2012	736m	South West
I102	Coronation Theatre	Item - General	Local	Upper Lachlan Local Environmental Plan 2010	09/07/2010	09/07/2010	09/11/2012	751m	South West
I108	National Bank [fmr]	Item - General	Local	Upper Lachlan Local Environmental Plan 2010	09/07/2010	09/07/2010	09/11/2012	807m	South West
I109	Manufacturers Mutual Insurance Building	Item - General	Local	Upper Lachlan Local Environmental Plan 2010	09/07/2010	09/07/2010	09/11/2012	827m	South West
I112	Gunning District Soldiers Memorial	Item - General	Local	Upper Lachlan Local Environmental Plan 2010	09/07/2010	09/07/2010	09/11/2012	830m	South West
I106	Gunning Public School	Item - General	Local	Upper Lachlan Local Environmental Plan 2010	09/07/2010	09/07/2010	09/11/2012	888m	South West
I110	Pye Cottage	Item - General	Local	Upper Lachlan Local Environmental Plan 2010	09/07/2010	09/07/2010	09/11/2012	983m	South West

Natural Hazards - Bush Fire Prone Land

18 Boureong Drive, Gunning, NSW 2581



Natural Hazards

18 Boureong Drive, Gunning, NSW 2581

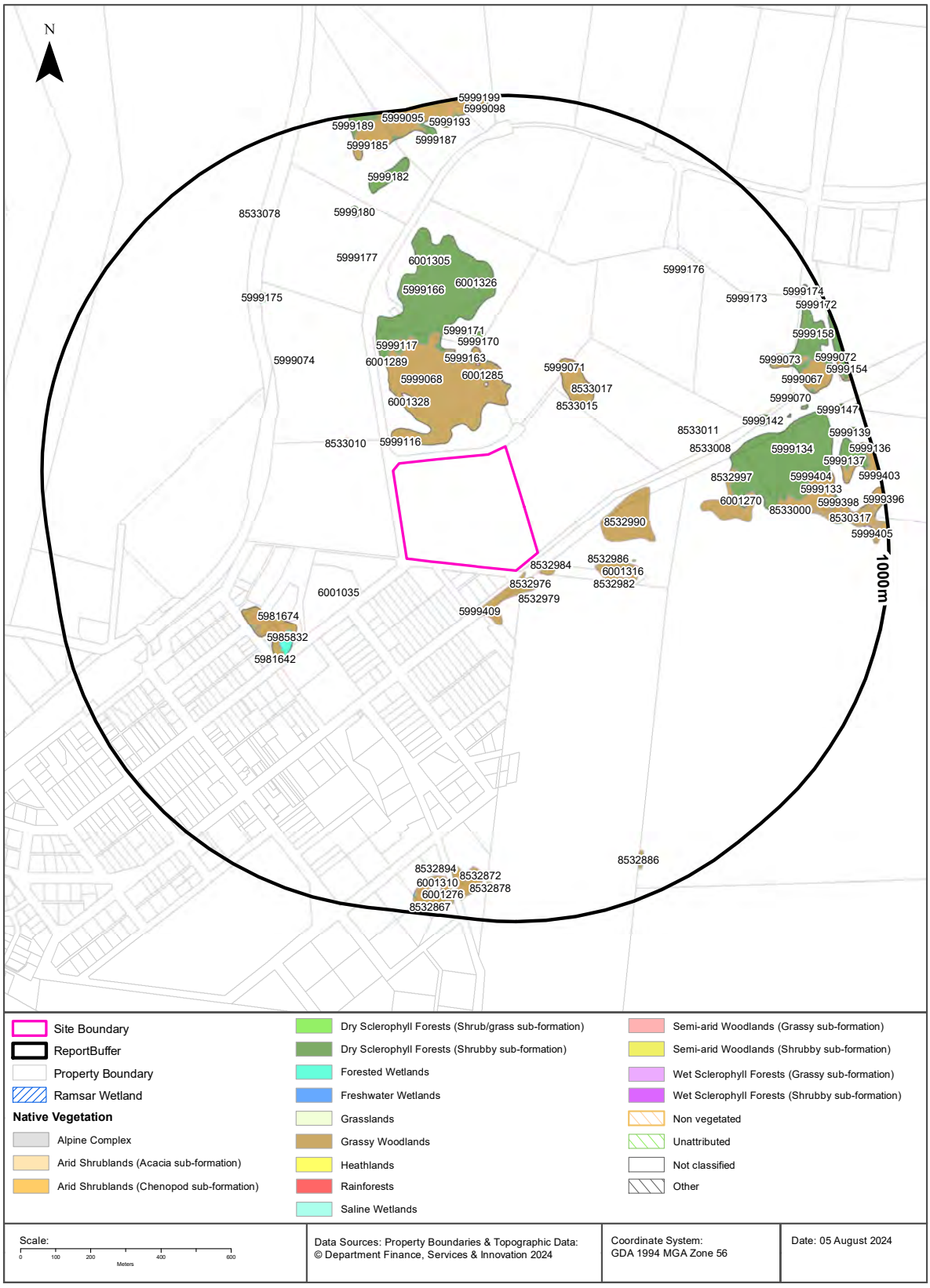
Bush Fire Prone Land

What are the nearest Bush Fire Prone Land Categories that exist within the dataset buffer?

Bush Fire Prone Land Category	Distance	Direction
Vegetation Buffer	0m	On-site
Vegetation Category 1	84m	North

Ecological Constraints - Vegetation & Ramsar Wetlands

18 Boureong Drive, Gunning, NSW 2581



Ecological Constraints

18 Boureong Drive, Gunning, NSW 2581

Native Vegetation

What native vegetation exists within the dataset buffer?

Map ID	Vegetation Formation	Plant Community Type and Vegetation Formation	Vegetation Class	Dist	Dir
6001035	Not classified	(Not classified) Not classified	Not classified	0m	On-site
8532976	Grassy Woodlands	(Grassy Woodlands) Southern Tableland Grassy Box Woodland	Southern Tableland Grassy Woodlands	17m	South East
5999068	Grassy Woodlands	(Grassy Woodlands) Central Tableland Clay Apple Box Grassy Forest	Southern Tableland Grassy Woodlands	42m	North
8532984	Grassy Woodlands	(Grassy Woodlands) Southern Tableland Grassy Box Woodland	Southern Tableland Grassy Woodlands	44m	South East
5999116	Dry Sclerophyll Forests (Shrubby sub-formation)	(Dry Sclerophyll Forests (Shrubby sub-formation)) Southern Tableland Western Hills Scribbly Gum Forest	Southern Tableland Dry Sclerophyll Forests	57m	North West
8532979	Grassy Woodlands	(Grassy Woodlands) Southern Tableland Grassy Box Woodland	Southern Tableland Grassy Woodlands	95m	South East
5999409	Grassy Woodlands	(Grassy Woodlands) Goulburn Tableland Box-Gum Grassy Forest	Southern Tableland Grassy Woodlands	124m	South
8533010	Grassy Woodlands	(Grassy Woodlands) Southern Tableland Grassy Box Woodland	Southern Tableland Grassy Woodlands	148m	North West
6001328	Not classified	(Not classified) Not classified	Not classified	153m	North West
8532982	Grassy Woodlands	(Grassy Woodlands) Southern Tableland Grassy Box Woodland	Southern Tableland Grassy Woodlands	167m	East
8532986	Grassy Woodlands	(Grassy Woodlands) Southern Tableland Grassy Box Woodland	Southern Tableland Grassy Woodlands	172m	East
5999157	Dry Sclerophyll Forests (Shrubby sub-formation)	(Dry Sclerophyll Forests (Shrubby sub-formation)) Southern Tableland Western Hills Scribbly Gum Forest	Southern Tableland Dry Sclerophyll Forests	173m	North
6001327	Not classified	(Not classified) Not classified	Not classified	181m	North
8532990	Grassy Woodlands	(Grassy Woodlands) Southern Tableland Grassy Box Woodland	Southern Tableland Grassy Woodlands	191m	East
6001285	Not classified	(Not classified) Not classified	Not classified	201m	North
5999160	Dry Sclerophyll Forests (Shrubby sub-formation)	(Dry Sclerophyll Forests (Shrubby sub-formation)) Southern Tableland Western Hills Scribbly Gum Forest	Southern Tableland Dry Sclerophyll Forests	204m	North
5999161	Dry Sclerophyll Forests (Shrubby sub-formation)	(Dry Sclerophyll Forests (Shrubby sub-formation)) Southern Tableland Western Hills Scribbly Gum Forest	Southern Tableland Dry Sclerophyll Forests	223m	North
5999071	Grassy Woodlands	(Grassy Woodlands) Central Tableland Clay Apple Box Grassy Forest	Southern Tableland Grassy Woodlands	226m	North East
6001316	Not classified	(Not classified) Not classified	Not classified	230m	East
5999162	Dry Sclerophyll Forests (Shrubby sub-formation)	(Dry Sclerophyll Forests (Shrubby sub-formation)) Southern Tableland Western Hills Scribbly Gum Forest	Southern Tableland Dry Sclerophyll Forests	233m	North
8533015	Grassy Woodlands	(Grassy Woodlands) Southern Tableland Grassy Box Woodland	Southern Tableland Grassy Woodlands	234m	North East
5999164	Dry Sclerophyll Forests (Shrubby sub-formation)	(Dry Sclerophyll Forests (Shrubby sub-formation)) Southern Tableland Western Hills Scribbly Gum Forest	Southern Tableland Dry Sclerophyll Forests	241m	North
6001265	Not classified	(Not classified) Not classified	Not classified	244m	North
8532987	Grassy Woodlands	(Grassy Woodlands) Southern Tableland Grassy Box Woodland	Southern Tableland Grassy Woodlands	247m	East
5999163	Dry Sclerophyll Forests (Shrubby sub-formation)	(Dry Sclerophyll Forests (Shrubby sub-formation)) Southern Tableland Western Hills Scribbly Gum Forest	Southern Tableland Dry Sclerophyll Forests	252m	North
6001284	Not classified	(Not classified) Not classified	Not classified	267m	North

Map ID	Vegetation Formation	Plant Community Type and Vegetation Formation	Vegetation Class	Dist	Dir
6001295	Not classified	(Not classified) Not classified	Not classified	268m	North
8532985	Grassy Woodlands	(Grassy Woodlands) Southern Tableland Grassy Box Woodland	Southern Tableland Grassy Woodlands	268m	East
5999167	Dry Sclerophyll Forests (Shrubby sub-formation)	(Dry Sclerophyll Forests (Shrubby sub-formation)) Southern Tableland Western Hills Scribbly Gum Forest	Southern Tableland Dry Sclerophyll Forests	274m	North
5999166	Dry Sclerophyll Forests (Shrubby sub-formation)	(Dry Sclerophyll Forests (Shrubby sub-formation)) Southern Tableland Western Hills Scribbly Gum Forest	Southern Tableland Dry Sclerophyll Forests	285m	North
5999168	Dry Sclerophyll Forests (Shrubby sub-formation)	(Dry Sclerophyll Forests (Shrubby sub-formation)) Southern Tableland Western Hills Scribbly Gum Forest	Southern Tableland Dry Sclerophyll Forests	288m	North
6001289	Not classified	(Not classified) Not classified	Not classified	291m	North West
8533017	Grassy Woodlands	(Grassy Woodlands) Southern Tableland Grassy Box Woodland	Southern Tableland Grassy Woodlands	294m	North East
5999170	Dry Sclerophyll Forests (Shrubby sub-formation)	(Dry Sclerophyll Forests (Shrubby sub-formation)) Southern Tableland Western Hills Scribbly Gum Forest	Southern Tableland Dry Sclerophyll Forests	306m	North
5999117	Dry Sclerophyll Forests (Shrubby sub-formation)	(Dry Sclerophyll Forests (Shrubby sub-formation)) Southern Tableland Western Hills Scribbly Gum Forest	Southern Tableland Dry Sclerophyll Forests	308m	North
5999171	Dry Sclerophyll Forests (Shrubby sub-formation)	(Dry Sclerophyll Forests (Shrubby sub-formation)) Southern Tableland Western Hills Scribbly Gum Forest	Southern Tableland Dry Sclerophyll Forests	335m	North
5981642	Grassy Woodlands	(Grassy Woodlands) Southern Tableland Grassy Box Woodland	Southern Tableland Grassy Woodlands	368m	South West
5985832	Forested Wetlands	(Forested Wetlands) Southwest Tableland Gorges Riparian Shrubland	Eastern Riverine Forests	385m	South West
5981674	Grassy Woodlands	(Grassy Woodlands) Southern Tableland Grassy Box Woodland	Southern Tableland Grassy Woodlands	396m	South West
5999074	Grassy Woodlands	(Grassy Woodlands) Central Tableland Clay Apple Box Grassy Forest	Southern Tableland Grassy Woodlands	413m	North West
8533029	Grassy Woodlands	(Grassy Woodlands) Southern Tableland Grassy Box Woodland	Southern Tableland Grassy Woodlands	413m	North West
6001326	Not classified	(Not classified) Not classified	Not classified	461m	North
8532997	Grassy Woodlands	(Grassy Woodlands) Southern Tableland Grassy Box Woodland	Southern Tableland Grassy Woodlands	479m	East
8533011	Grassy Woodlands	(Grassy Woodlands) Southern Tableland Grassy Box Woodland	Southern Tableland Grassy Woodlands	528m	East
8533008	Grassy Woodlands	(Grassy Woodlands) Southern Tableland Grassy Box Woodland	Southern Tableland Grassy Woodlands	555m	East
6001275	Not classified	(Not classified) Not classified	Not classified	559m	North
6001305	Not classified	(Not classified) Not classified	Not classified	565m	North
5999134	Dry Sclerophyll Forests (Shrubby sub-formation)	(Dry Sclerophyll Forests (Shrubby sub-formation)) Southern Tableland Western Hills Scribbly Gum Forest	Southern Tableland Dry Sclerophyll Forests	568m	East
5999177	Dry Sclerophyll Forests (Shrubby sub-formation)	(Dry Sclerophyll Forests (Shrubby sub-formation)) Southern Tableland Western Hills Scribbly Gum Forest	Southern Tableland Dry Sclerophyll Forests	592m	North West
6001270	Not classified	(Not classified) Not classified	Not classified	593m	East
5999175	Dry Sclerophyll Forests (Shrubby sub-formation)	(Dry Sclerophyll Forests (Shrubby sub-formation)) Southern Tableland Western Hills Scribbly Gum Forest	Southern Tableland Dry Sclerophyll Forests	600m	North West
5999404	Grassy Woodlands	(Grassy Woodlands) Central Tableland Clay Apple Box Grassy Forest	Southern Tableland Grassy Woodlands	691m	East
8533000	Grassy Woodlands	(Grassy Woodlands) Southern Tableland Grassy Box Woodland	Southern Tableland Grassy Woodlands	694m	East
5999142	Dry Sclerophyll Forests (Shrubby sub-formation)	(Dry Sclerophyll Forests (Shrubby sub-formation)) Southern Tableland Western Hills Scribbly Gum Forest	Southern Tableland Dry Sclerophyll Forests	702m	East
5999176	Dry Sclerophyll Forests (Shrubby sub-formation)	(Dry Sclerophyll Forests (Shrubby sub-formation)) Southern Tableland Western Hills Scribbly Gum Forest	Southern Tableland Dry Sclerophyll Forests	707m	North East
5999180	Dry Sclerophyll Forests (Shrubby sub-formation)	(Dry Sclerophyll Forests (Shrubby sub-formation)) Southern Tableland Western Hills Scribbly Gum Forest	Southern Tableland Dry Sclerophyll Forests	712m	North

Map ID	Vegetation Formation	Plant Community Type and Vegetation Formation	Vegetation Class	Dist	Dir
8530317	Grassy Woodlands	(Grassy Woodlands) Southern Tableland Grassy Box Woodland	Southern Tableland Grassy Woodlands	744m	East
5999182	Dry Sclerophyll Forests (Shrubby sub-formation)	(Dry Sclerophyll Forests (Shrubby sub-formation)) Southern Tableland Western Hills Scribbly Gum Forest	Southern Tableland Dry Sclerophyll Forests	774m	North
5999073	Grassy Woodlands	(Grassy Woodlands) Central Tableland Clay Apple Box Grassy Forest	Southern Tableland Grassy Woodlands	786m	North East
5999145	Dry Sclerophyll Forests (Shrubby sub-formation)	(Dry Sclerophyll Forests (Shrubby sub-formation)) Southern Tableland Western Hills Scribbly Gum Forest	Southern Tableland Dry Sclerophyll Forests	792m	East
5999173	Dry Sclerophyll Forests (Shrubby sub-formation)	(Dry Sclerophyll Forests (Shrubby sub-formation)) Southern Tableland Western Hills Scribbly Gum Forest	Southern Tableland Dry Sclerophyll Forests	799m	North East
8533078	Grassy Woodlands	(Grassy Woodlands) Southern Tableland Grassy Box Woodland	Southern Tableland Grassy Woodlands	804m	North West
5999070	Grassy Woodlands	(Grassy Woodlands) Central Tableland Clay Apple Box Grassy Forest	Southern Tableland Grassy Woodlands	810m	East
5999158	Dry Sclerophyll Forests (Shrubby sub-formation)	(Dry Sclerophyll Forests (Shrubby sub-formation)) Southern Tableland Western Hills Scribbly Gum Forest	Southern Tableland Dry Sclerophyll Forests	824m	North East
5999133	Dry Sclerophyll Forests (Shrubby sub-formation)	(Dry Sclerophyll Forests (Shrubby sub-formation)) Southern Tableland Western Hills Scribbly Gum Forest	Southern Tableland Dry Sclerophyll Forests	827m	East
5999149	Dry Sclerophyll Forests (Shrubby sub-formation)	(Dry Sclerophyll Forests (Shrubby sub-formation)) Southern Tableland Western Hills Scribbly Gum Forest	Southern Tableland Dry Sclerophyll Forests	836m	East
8532872	Grassy Woodlands	(Grassy Woodlands) Southern Tableland Grassy Box Woodland	Southern Tableland Grassy Woodlands	853m	South
5999398	Grassy Woodlands	(Grassy Woodlands) Central Tableland Clay Apple Box Grassy Forest	Southern Tableland Grassy Woodlands	855m	East
5999067	Grassy Woodlands	(Grassy Woodlands) Central Tableland Clay Apple Box Grassy Forest	Southern Tableland Grassy Woodlands	860m	East
5999065	Grassy Woodlands	(Grassy Woodlands) Central Tableland Clay Apple Box Grassy Forest	Southern Tableland Grassy Woodlands	862m	North East
8532894	Grassy Woodlands	(Grassy Woodlands) Southern Tableland Grassy Box Woodland	Southern Tableland Grassy Woodlands	865m	South
5999095	Grassy Woodlands	(Grassy Woodlands) Central Tableland Clay Apple Box Grassy Forest	Southern Tableland Grassy Woodlands	873m	North
8532886	Grassy Woodlands	(Grassy Woodlands) Southern Tableland Grassy Box Woodland	Southern Tableland Grassy Woodlands	873m	South East
8532892	Grassy Woodlands	(Grassy Woodlands) Southern Tableland Grassy Box Woodland	Southern Tableland Grassy Woodlands	873m	South
5999153	Dry Sclerophyll Forests (Shrubby sub-formation)	(Dry Sclerophyll Forests (Shrubby sub-formation)) Southern Tableland Western Hills Scribbly Gum Forest	Southern Tableland Dry Sclerophyll Forests	875m	East
5999187	Dry Sclerophyll Forests (Shrubby sub-formation)	(Dry Sclerophyll Forests (Shrubby sub-formation)) Southern Tableland Western Hills Scribbly Gum Forest	Southern Tableland Dry Sclerophyll Forests	886m	North
8532867	Grassy Woodlands	(Grassy Woodlands) Southern Tableland Grassy Box Woodland	Southern Tableland Grassy Woodlands	888m	South
5999183	Dry Sclerophyll Forests (Shrubby sub-formation)	(Dry Sclerophyll Forests (Shrubby sub-formation)) Southern Tableland Western Hills Scribbly Gum Forest	Southern Tableland Dry Sclerophyll Forests	891m	North
8532878	Grassy Woodlands	(Grassy Woodlands) Southern Tableland Grassy Box Woodland	Southern Tableland Grassy Woodlands	891m	South
5999401	Grassy Woodlands	(Grassy Woodlands) Central Tableland Clay Apple Box Grassy Forest	Southern Tableland Grassy Woodlands	893m	East
5999135	Dry Sclerophyll Forests (Shrubby sub-formation)	(Dry Sclerophyll Forests (Shrubby sub-formation)) Southern Tableland Western Hills Scribbly Gum Forest	Southern Tableland Dry Sclerophyll Forests	894m	East
5999137	Dry Sclerophyll Forests (Shrubby sub-formation)	(Dry Sclerophyll Forests (Shrubby sub-formation)) Southern Tableland Western Hills Scribbly Gum Forest	Southern Tableland Dry Sclerophyll Forests	896m	East
5999406	Grassy Woodlands	(Grassy Woodlands) Central Tableland Clay Apple Box Grassy Forest	Southern Tableland Grassy Woodlands	902m	East
5999185	Dry Sclerophyll Forests (Shrubby sub-formation)	(Dry Sclerophyll Forests (Shrubby sub-formation)) Southern Tableland Western Hills Scribbly Gum Forest	Southern Tableland Dry Sclerophyll Forests	904m	North
6001310	Not classified	(Not classified) Not classified	Not classified	907m	South

Map ID	Vegetation Formation	Plant Community Type and Vegetation Formation	Vegetation Class	Dist	Dir
5999186	Dry Sclerophyll Forests (Shrubby sub-formation)	(Dry Sclerophyll Forests (Shrubby sub-formation)) Southern Tableland Western Hills Scribbly Gum Forest	Southern Tableland Dry Sclerophyll Forests	910m	North
5999188	Dry Sclerophyll Forests (Shrubby sub-formation)	(Dry Sclerophyll Forests (Shrubby sub-formation)) Southern Tableland Western Hills Scribbly Gum Forest	Southern Tableland Dry Sclerophyll Forests	910m	North
5999396	Grassy Woodlands	(Grassy Woodlands) Central Tableland Clay Apple Box Grassy Forest	Southern Tableland Grassy Woodlands	922m	East
5999193	Dry Sclerophyll Forests (Shrubby sub-formation)	(Dry Sclerophyll Forests (Shrubby sub-formation)) Southern Tableland Western Hills Scribbly Gum Forest	Southern Tableland Dry Sclerophyll Forests	923m	North
5999405	Grassy Woodlands	(Grassy Woodlands) Central Tableland Clay Apple Box Grassy Forest	Southern Tableland Grassy Woodlands	927m	East
5985831	Forested Wetlands	(Forested Wetlands) Southwest Tableland Gorges Riparian Shrubland	Eastern Riverine Forests	928m	South
5999190	Dry Sclerophyll Forests (Shrubby sub-formation)	(Dry Sclerophyll Forests (Shrubby sub-formation)) Southern Tableland Western Hills Scribbly Gum Forest	Southern Tableland Dry Sclerophyll Forests	928m	North
6001276	Not classified	(Not classified) Not classified	Not classified	928m	South
5999189	Dry Sclerophyll Forests (Shrubby sub-formation)	(Dry Sclerophyll Forests (Shrubby sub-formation)) Southern Tableland Western Hills Scribbly Gum Forest	Southern Tableland Dry Sclerophyll Forests	935m	North
5985830	Forested Wetlands	(Forested Wetlands) Southwest Tableland Gorges Riparian Shrubland	Eastern Riverine Forests	936m	South
5999147	Dry Sclerophyll Forests (Shrubby sub-formation)	(Dry Sclerophyll Forests (Shrubby sub-formation)) Southern Tableland Western Hills Scribbly Gum Forest	Southern Tableland Dry Sclerophyll Forests	936m	East
5999192	Dry Sclerophyll Forests (Shrubby sub-formation)	(Dry Sclerophyll Forests (Shrubby sub-formation)) Southern Tableland Western Hills Scribbly Gum Forest	Southern Tableland Dry Sclerophyll Forests	936m	North
5999139	Dry Sclerophyll Forests (Shrubby sub-formation)	(Dry Sclerophyll Forests (Shrubby sub-formation)) Southern Tableland Western Hills Scribbly Gum Forest	Southern Tableland Dry Sclerophyll Forests	946m	East
5999196	Dry Sclerophyll Forests (Shrubby sub-formation)	(Dry Sclerophyll Forests (Shrubby sub-formation)) Southern Tableland Western Hills Scribbly Gum Forest	Southern Tableland Dry Sclerophyll Forests	948m	North
5999197	Dry Sclerophyll Forests (Shrubby sub-formation)	(Dry Sclerophyll Forests (Shrubby sub-formation)) Southern Tableland Western Hills Scribbly Gum Forest	Southern Tableland Dry Sclerophyll Forests	955m	North
5999174	Dry Sclerophyll Forests (Shrubby sub-formation)	(Dry Sclerophyll Forests (Shrubby sub-formation)) Southern Tableland Western Hills Scribbly Gum Forest	Southern Tableland Dry Sclerophyll Forests	956m	North East
5999403	Grassy Woodlands	(Grassy Woodlands) Central Tableland Clay Apple Box Grassy Forest	Southern Tableland Grassy Woodlands	958m	East
5999098	Grassy Woodlands	(Grassy Woodlands) Central Tableland Clay Apple Box Grassy Forest	Southern Tableland Grassy Woodlands	964m	North
5999072	Grassy Woodlands	(Grassy Woodlands) Central Tableland Clay Apple Box Grassy Forest	Southern Tableland Grassy Woodlands	969m	East
5999154	Dry Sclerophyll Forests (Shrubby sub-formation)	(Dry Sclerophyll Forests (Shrubby sub-formation)) Southern Tableland Western Hills Scribbly Gum Forest	Southern Tableland Dry Sclerophyll Forests	970m	North East
5999172	Dry Sclerophyll Forests (Shrubby sub-formation)	(Dry Sclerophyll Forests (Shrubby sub-formation)) Southern Tableland Western Hills Scribbly Gum Forest	Southern Tableland Dry Sclerophyll Forests	972m	North East
5999198	Dry Sclerophyll Forests (Shrubby sub-formation)	(Dry Sclerophyll Forests (Shrubby sub-formation)) Southern Tableland Western Hills Scribbly Gum Forest	Southern Tableland Dry Sclerophyll Forests	972m	North
5999136	Dry Sclerophyll Forests (Shrubby sub-formation)	(Dry Sclerophyll Forests (Shrubby sub-formation)) Southern Tableland Western Hills Scribbly Gum Forest	Southern Tableland Dry Sclerophyll Forests	983m	East
5999146	Dry Sclerophyll Forests (Shrubby sub-formation)	(Dry Sclerophyll Forests (Shrubby sub-formation)) Southern Tableland Western Hills Scribbly Gum Forest	Southern Tableland Dry Sclerophyll Forests	987m	East
5999069	Grassy Woodlands	(Grassy Woodlands) Central Tableland Clay Apple Box Grassy Forest	Southern Tableland Grassy Woodlands	991m	East
5999199	Dry Sclerophyll Forests (Shrubby sub-formation)	(Dry Sclerophyll Forests (Shrubby sub-formation)) Southern Tableland Western Hills Scribbly Gum Forest	Southern Tableland Dry Sclerophyll Forests	992m	North

Ecological Constraints

18 Boureong Drive, Gunning, NSW 2581

Ramsar Wetlands

What Ramsar Wetland areas exist within the dataset buffer?

Map ID	Ramsar Name	Wetland Name	Designation Date	Source	Distance	Direction
N/A	No records in buffer					

Ramsar Wetlands Data Source: © Commonwealth of Australia - Department of Agriculture, Water and the Environment

Ecological Constraints

18 Boureong Drive, Gunning, NSW 2581

Collaborative Australian Protected Areas Database - Terrestrial

Protected areas in terrestrial environments identified by the CAPAD within the dataset buffer:

Map ID	Area Name	Area Details	Management Category	Authority	Jurisdiction	Dist	Dir
N/A	No records in buffer						

Collaborative Australian Protected Areas Database - Marine

Protected areas in marine environments identified by the CAPAD within the dataset buffer:

Map ID	Area Name	Area Details	Management Category	Authority	Jurisdiction	Dist	Dir
N/A	No records in buffer						

Source: Collaborative Australian Protected Areas Database (CAPAD) 2022

Ecological Constraints - Groundwater Dependent Ecosystems Atlas

18 Boureong Drive, Gunning, NSW 2581

Ecological Constraints

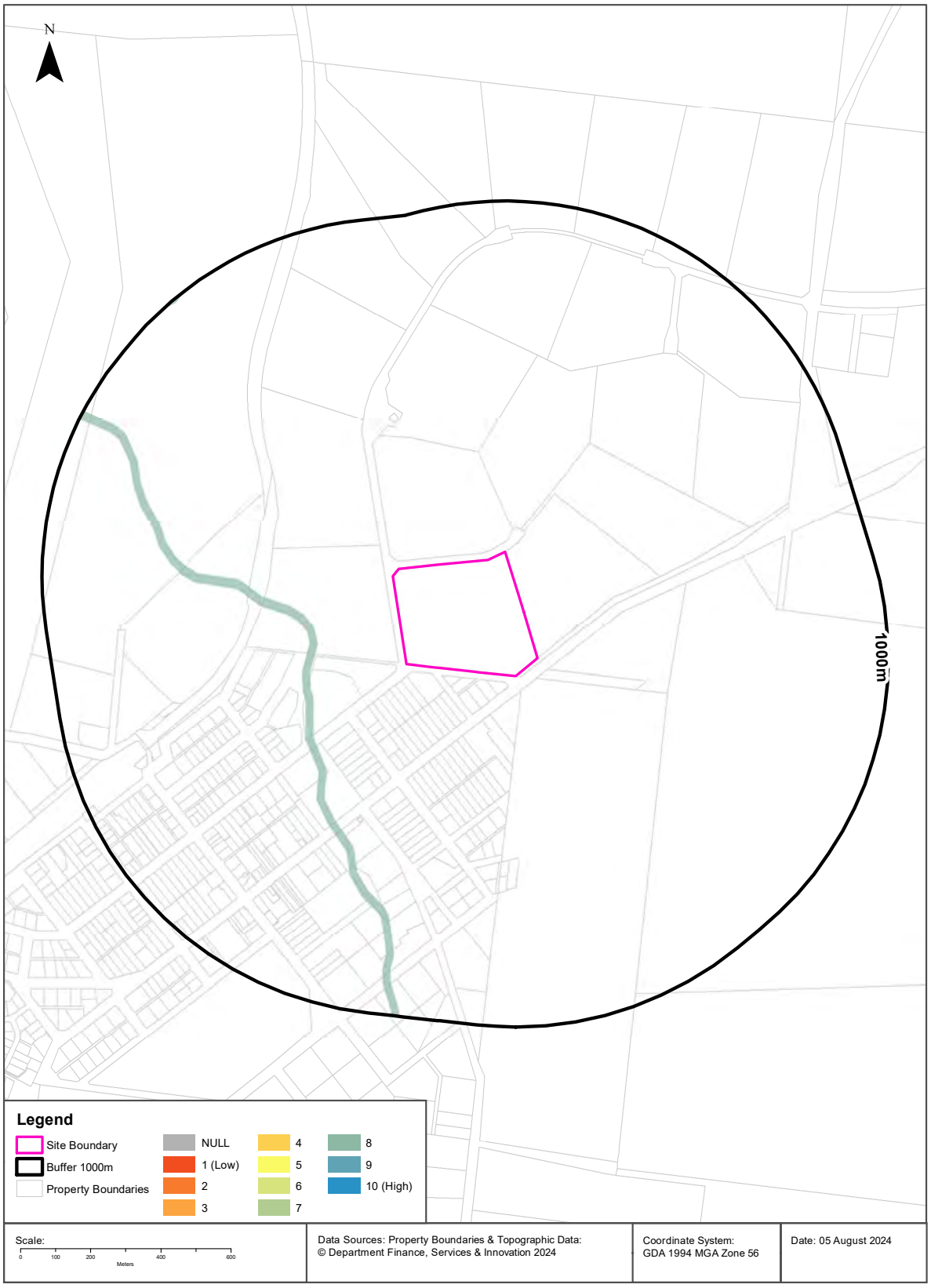
18 Boureong Drive, Gunning, NSW 2581

Groundwater Dependent Ecosystems Atlas

Type	GDE Potential	Geomorphology	Ecosystem Type	Aquifer Geology	Distance	Direction
Aquatic	High potential GDE - from national assessment	Granitic and basaltic tablelands and minor lowlands; includes the Canobolas dissected volcanic pile.	River		241m	West

Ecological Constraints - Inflow Dependent Ecosystems Likelihood

18 Boureong Drive, Gunning, NSW 2581



Ecological Constraints

18 Boureong Drive, Gunning, NSW 2581

Inflow Dependent Ecosystems Likelihood

Type	IDE Likelihood	Geomorphology	Ecosystem Type	Aquifer Geology	Distance	Direction
Aquatic	8	Granitic and basaltic tablelands and minor lowlands; includes the Canobolas dissected volcanic pile.	River		241m	West

Ecological Constraints

18 Boureong Drive, Gunning, NSW 2581

NSW BioNet Species Sightings

Species sightings from the NSW BioNet Repository that have either a state or federal conservation status, or a sensitivity status, and are within 10 km of the site:
Note: This data does not include NSW Category 1 sensitive species.

Kingdom	Class	Scientific	Common	Sensitivity Class	State Conservation Status	Federal Conservation Status	Migratory Species Agreements
Animalia	Aves	Anthochaera phrygia	Regent Honeyeater	Category 2	Critically Endangered	Critically Endangered	
Animalia	Aves	Aphelocephala leucopsis	Southern Whiteface	Not Sensitive	Vulnerable	Vulnerable	
Animalia	Aves	Artamus cyanopterus cyanopterus	Dusky Woodswallow	Not Sensitive	Vulnerable	Not Listed	
Animalia	Aves	Callocephalon fimbriatum	Gang-gang Cockatoo	Category 3	Endangered	Endangered	
Animalia	Aves	Chthonicola sagittata	Speckled Warbler	Not Sensitive	Vulnerable	Not Listed	
Animalia	Aves	Climacteris picumnus victoriae	Brown Treecreeper (eastern subspecies)	Not Sensitive	Vulnerable	Vulnerable	
Animalia	Aves	Daphoenositta chrysoptera	Varied Sittella	Not Sensitive	Vulnerable	Not Listed	
Animalia	Aves	Epthianura albifrons	White-fronted Chat	Not Sensitive	Vulnerable	Not Listed	
Animalia	Aves	Grantiella picta	Painted Honeyeater	Not Sensitive	Vulnerable	Vulnerable	
Animalia	Aves	Hieraaetus morphnoides	Little Eagle	Not Sensitive	Vulnerable	Not Listed	
Animalia	Aves	Melanodryas cucullata cucullata	South-eastern Hooded Robin	Not Sensitive	Endangered	Endangered	
Animalia	Aves	Petroica boodang	Scarlet Robin	Not Sensitive	Vulnerable	Not Listed	
Animalia	Aves	Petroica phoenicea	Flame Robin	Not Sensitive	Vulnerable	Not Listed	
Animalia	Aves	Polytelis swainsonii	Superb Parrot	Category 3	Vulnerable	Vulnerable	
Animalia	Aves	Stagonopleura guttata	Diamond Firetail	Not Sensitive	Vulnerable	Vulnerable	
Animalia	Mammalia	Pteropus poliocephalus	Grey-headed Flying-fox	Not Sensitive	Vulnerable	Vulnerable	
Plantae	Flora	Eucalyptus nicholii	Narrow-leaved Black Peppermint	Not Sensitive	Vulnerable	Vulnerable	
Plantae	Flora	Leucochrysum albicans subsp. tricolor	Hoary Sunray	Not Sensitive	Endangered	Endangered	

Source: NSW BioNet Species Sightings

Location Confidences

Where Lotsearch has had to georeference features from supplied addresses, a location confidence has been assigned to the data record. This indicates a confidence to the positional accuracy of the feature. Where applicable, a code is given under the field heading “LC” or “LocConf”. These codes lookup to the following location confidences:

LC Code	Location Confidence
Premise Match	Georeferenced to the site location / premise or part of site
Area Match	Georeferenced to an approximate or general area
Road Match	Georeferenced to a road or rail corridor
Road Intersection	Georeferenced to a road intersection
Buffered Point	A point feature buffered to x metres
Adjacent Match	Land adjacent to a georeferenced feature
Network of Features	Georeferenced to a network of features
Suburb Match	Georeferenced to a suburb boundary
As Supplied	Spatial data supplied by provider

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12. These Terms are subject to New South Wales law.

Appendix D Photolog

Photograph Log

Client Name:	Site Location:	Project Number:
Stuart and Catherine Duke, care of Laterals Planning Pty Ltd.	18 Boureong Drive, Gunning, NSW, 2581.	AU124119

Photo Number:	Date:
1	08/08/24

Description:

Entrance from Ryan Place, along northern boundary of the site.

Photo Number:	Date:
2	08/08/24

Description:

Residential property and gravel pack entrance located within the northeastern portion of the site.

Photograph Log

Client Name:	Site Location:	Project Number:
Stuart and Catherine Duke, care of Laterals Planning Pty Ltd.	18 Boureong Drive, Gunning, NSW, 2581.	AU124119

Photo Number:	Date:	
3	08/08/24	
Description: Storage shed located within northeastern portion of the site.		

Photo Number:	Date:	
4	0/08/24	
Description: Vehicle and miscellaneous household items storage within shed.		

Photograph Log

Client Name:	Site Location:	Project Number:
Stuart and Catherine Duke, care of Laterals Planning Pty Ltd.	18 Boureong Drive, Gunning, NSW, 2581.	AU124119

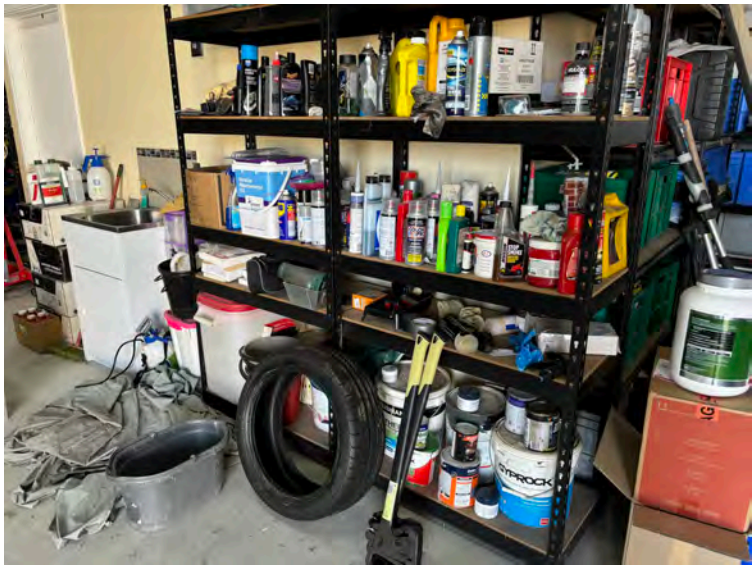
Photo Number:	Date:	
5	08/08/24	
Description: Household chemical storage observed within sheds.		

Photo Number:	Date:	
6	08/08/24	
Description: Example of vegetated stockpile comprising site-won soils.		

Photograph Log

Client Name:	Site Location:	Project Number:
Stuart and Catherine Duke, care of Laterals Planning Pty Ltd.	18 Boureong Drive, Gunning, NSW, 2581.	AU124119

Photo Number:	Date:
7	08/08/24

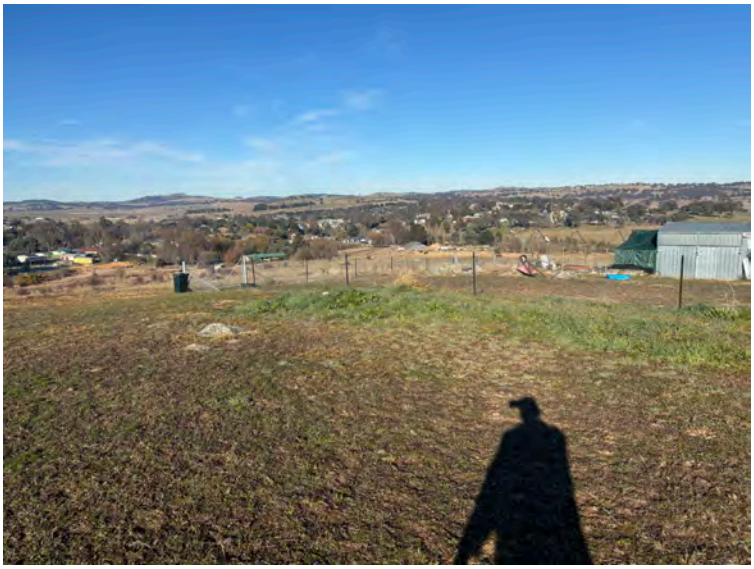
Description:

100,000L water tank and centrifugal pump system observed within the northeastern portion of the site.

Photo Number:	Date:
8	08/08/24

Description:

View of the site facing west.



Photograph Log

Client Name:	Site Location:	Project Number:
Stuart and Catherine Duke, care of Laterals Planning Pty Ltd.	18 Boureong Drive, Gunning, NSW, 2581.	AU124119

Photo Number:	Date:
9	08/08/24

Description:

Example of typical ground condition and vegetation encountered within the site.

Photo Number:	Date:
10	08/08/24

Description:

Barbed wire picket fence observed along the southern boundary of the site.

Photograph Log

Client Name:	Site Location:	Project Number:
Stuart and Catherine Duke, care of Laterals Planning Pty Ltd.	18 Boureong Drive, Gunning, NSW, 2581.	AU124119

Photo Number:	Date:
11	08/08/24

Description:

Condition of unnamed creek observed on its western extremity, adjacent to the southern boundary of the site.

Photo Number:	Date:
12	08/08/24

Description:

Surface water observed at southern boundary of the site.

Photograph Log

Client Name:	Site Location:	Project Number:
Stuart and Catherine Duke, care of Laterals Planning Pty Ltd.	18 Boureong Drive, Gunning, NSW, 2581.	AU124119

Photo Number:	Date:
13	08/08/24

Description:

Conditions encountered at the creek adjacent to the eastern boundary of the site.

Photo Number:	Date:
14	08/08/2

Description:

Suspended solids and slightly brown colouration of surface water sample collected from eastern boundary of the site.

Photograph Log

Client Name:	Site Location:	Project Number:
Stuart and Catherine Duke, care of Laterals Planning Pty Ltd.	18 Boureong Drive, Gunning, NSW, 2581.	AU124119

Photo Number:	Date:	
15	08/08/24.	
Description: Encountered sediment along eastern boundary of the site.		

Photo Number:	Date:	
16	30/04/24	
Description: Topsoil, typically characterised as Sandy SILT, encountered within the boreholes advanced across the site.		

Photograph Log

Client Name:	Site Location:	Project Number:
Stuart and Catherine Duke, care of Laterals Planning Pty Ltd.	18 Boureong Drive, Gunning, NSW, 2581.	AU124119

Photo Number:	Date:
17	08/08/24.

Description:

Sandy Silt topsoil profile encountered within the boreholes advanced across the site.

Photo Number:	Date:
18	08/08/24

Description:

Soil encountered within BH103 in the northeastern section of the site.

Photograph Log

Client Name:	Site Location:	Project Number:
Stuart and Catherine Duke, care of Laterals Planning Pty Ltd.	18 Boureong Drive, Gunning, NSW, 2581.	AU124119

Photo Number:	Date:
19	08/08/24

Description:

Underlying natural clay soils observed at the base of BH102 in the northeastern section of the site.

Photo Number:	Date:
20	08/08/24

Description:

Source location of site-won stockpiles located north of the residential property.

Appendix E Borehole Logs

Geosyntec consultants

Geosyntec - Sydney
Suite 3.04, Level 3, 1 York Street, Sydney, NSW 2000
Phone: 02 9251 8070

Environmental Log - Borehole

BH101

UTM	: 55H	Drill Rig	: Powered Auger	Job Number	: AU124119
Easting (m)	: 708,049.50	Driller Supplier	: Geosyntec	Client	: Laterals Planning Pty Ltd.
Northing (m)	: 6,149,507.52	Logged By	: CN	Project	: ESA Stuart Catherine Gunning
Ground Elevation	: Not Surveyed	Reviewed By	: PD	Location	: 18 Boureong Drive, Gunning NSW
Total Depth	: 0.3 m BGL	Date	08/08/2024	Loc Comment	:

Drilling Method	Depth (m)	Water	Graphic Log	Classification Code	Material Description	Moisture	Consistency	Samples: Soil jar	Samples: 500ml Asb	Testing: PID	Remarks
Hand Auger				ML	Topsoil: Sandy SILT ML; low plasticity, brown, fine grained sand, soft.	M	S	BH101_0-0.1	BH101_0-0.1	1.2	No ACM or staining. Organic Odour.
					BH101 Terminated at 0.3m (Target Depth Reached)						

This report must be read in conjunction with accompanying notes and abbreviations. It has been prepared for environmental purposes only, without attempt to consider geotechnical properties or the geotechnical significance of the materials encountered. As such it should not be relied upon for geotechnical purposes.

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Geosyntec consultants

Geosyntec - Sydney

Suite 3.04, Level 3, 1 York Street, Sydney, NSW 2000

Phone: 02 9251 8070

Environmental Log - Borehole

BH102

UTM	**: 55H**	**Drill Rig**	**: Powered Auger**	**Job Number**	**: AU124119**
Easting (m)	**: 708,049.50**	**Driller Supplier**	**: Geosyntec**	**Client**	**: Laterals Planning Pty Ltd.**
Northing (m)	**: 6,149,507.52**	**Logged By**	**: CN**	**Project**	**: ESA Stuart Catherine Gunning**
Ground Elevation	**: Not Surveyed**	**Reviewed By**	**: PD**	**Location**	**: 18 Boureong Drive, Gunning NSW**
Total Depth	**: 0.3 m BGL**	**Date**	**08/08/2024**	**Loc Comment**	**:**

Drilling Method	Depth (m)	Water	Graphic Log	Classification Code	Material Description	Moisture	Consistency	Samples: Soil Jar	Samples: 500ml Asb	Testing: PID	Remarks
Hand Auger				ML	Topsoil: Sandy SILT ML; low plasticity, brown, fine grained sand, soft.	M	S	BH102_0.1-0.2	BH102_0.1-0.2	0.9	No ACM or staining. Organic Odour.
				CI	CLAY CI: medium plasticity, brown, fine-grained sand, trace fine-grained igneous gravel, trace clay, soft.		F				
					BH102 Terminated at 0.3m (Target Depth Reached)						

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Geosyntec - Sydney

Suite 3.04, Level 3, 1 York Street, Sydney, NSW 2000

Phone: 02 9251 8070

Environmental Log - Borehole

BH103

UTM	**: 55H**	**Drill Rig**	**: Powered Auger**	**Job Number**	**: AU124119**
Easting (m)	**: 708,049.50**	**Driller Supplier**	**: Geosyntec**	**Client**	**: Laterals Planning Pty Ltd.**
Northing (m)	**: 6,149,507.52**	**Logged By**	**: CN**	**Project**	**: ESA Stuart Catherine Gunning**
Ground Elevation	**: Not Surveyed**	**Reviewed By**	**: PD**	**Location**	**: 18 Boureong Drive, Gunning NSW**
Total Depth	**: 0.3 m BGL**	**Date**	**08/08/2024**	**Loc Comment**	**:**

Drilling Method	Depth (m)	Water	Graphic Log	Classification Code	Material Description	Moisture	Consistency	Samples: Soil Jar	Samples: 500ml Asb	Testing: PID	Remarks
Hand Auger				ML	Sandy SILT ML: medium plasticity, brown, fine grained sand, trace fine-grained gravel, trace medium plasticity clay, soft.	M	S	BH103_0.1-0.2	BH103_0.1-0.2	3.0	No ACM or staining. Organic Odour.
					BH103 Terminated at 0.3m (Target Depth Reached)						

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Geosyntec consultants

Geosyntec - Sydney
Suite 3.04, Level 3, 1 York Street, Sydney, NSW 2000
Phone: 02 9251 8070

Environmental Log - Borehole

BH104

UTM	: 55H	Drill Rig	: Powered Auger	Job Number	: AU124119
Easting (m)	: 708,049.50	Driller Supplier	: Geosyntec	Client	: Laterals Planning Pty Ltd.
Northing (m)	: 6,149,507.52	Logged By	: CN	Project	: ESA Stuart Catherine Gunning
Ground Elevation	: Not Surveyed	Reviewed By	: PD	Location	: 18 Boureong Drive, Gunning NSW
Total Depth	: 0.3 m BGL	Date	08/08/2024	Loc Comment	:

Drilling Method	Depth (m)	Water	Graphic Log	Classification Code	Material Description	Moisture	Consistency	Samples: Soil Jar	Samples: 500ml Asb	Testing: PID	Remarks
Hand Auger				ML	Sandy SILT ML: medium plasticity, brown, fine-grained sand, trace fine-grained gravel, trace medium plasticity clay, soft.	M	S				No ACM or staining. Organic Odour.
								BH104_0.2-0.3	BH104_0.2-0.3	0.6	
					BH104 Terminated at 0.3m (Target Depth Reached)						

This report must be read in conjunction with accompanying notes and abbreviations. It has been prepared for environmental purposes only, without attempt to consider geotechnical properties or the geotechnical significance of the materials encountered. As such it should not be relied upon for geotechnical purposes.

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Geosyntec consultants

Geosyntec - Sydney

Suite 3.04, Level 3, 1 York Street, Sydney, NSW 2000

Phone: 02 9251 8070

Environmental Log - Borehole

BH105

UTM	**: 55H**	**Drill Rig**	**: Powered Auger**	**Job Number**	**: AU124119**
Easting (m)	**: 708,049.50**	**Driller Supplier**	**: Geosyntec**	**Client**	**: Laterals Planning Pty Ltd.**
Northing (m)	**: 6,149,507.52**	**Logged By**	**: CN**	**Project**	**: ESA Stuart Catherine Gunning**
Ground Elevation	**: Not Surveyed**	**Reviewed By**	**: PD**	**Location**	**: 18 Boureong Drive, Gunning NSW**
Total Depth	**: 0.3 m BGL**	**Date**	**08/08/2024**	**Loc Comment**	**:**

Drilling Method	Depth (m)	Water	Graphic Log	Classification Code	Material Description	Moisture	Consistency	Samples: Soil Jar	Samples: 500ml Asb	Testing: PID	Remarks
Hand Auger				ML	Sandy SILT ML: medium plasticity, brown, fine- grained sand, trace fine-grained gravel, trace medium plasticity clay, soft.	M	S	BH105_0-0.1	BH105_0-0.1	1.7	No ACM or staining. Organic Odour.
					BH105 Terminated at 0.3m (Target Depth Reached)						

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Geosyntec consultants

Geosyntec - Sydney
Suite 3.04, Level 3, 1 York Street, Sydney, NSW 2000
Phone: 02 9251 8070

Environmental Log - Borehole

BH106

UTM	: 55H	Drill Rig	: Powered Auger	Job Number	: AU124119
Easting (m)	: 708,049.50	Driller Supplier	: Geosyntec	Client	: Laterals Planning Pty Ltd.
Northing (m)	: 6,149,507.52	Logged By	: CN	Project	: ESA Stuart Catherine Gunning
Ground Elevation	: Not Surveyed	Reviewed By	: PD	Location	: 18 Boureong Drive, Gunning NSW
Total Depth	: 0.3 m BGL	Date	08/08/2024	Loc Comment	:

Drilling Method	Depth (m)	Water	Graphic Log	Classification Code	Material Description	Moisture	Consistency	Samples: Soil Jar	Samples: 500ml Asb	Testing: PID	Remarks
Hand Auger				ML	Sandy SILT ML: medium plasticity, brown, fine-grained sand, trace fine grained gravel, trace medium plasticity clay, soft.	M	S	BH106_0-0.1	BH106_0-0.1	1.1	No ACM or staining. Organic Odour.
					BH106 Terminated at 0.3m (Target Depth Reached)						

This report must be read in conjunction with accompanying notes and abbreviations. It has been prepared for environmental purposes only, without attempt to consider geotechnical properties or the geotechnical significance of the materials encountered. As such it should not be relied upon for geotechnical purposes.

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Appendix F DQIs and QAQC Assessment

Table 1

Data Quality Objective	Sampling Frequency	Frequency Achieved?	DQI	DQI Met?
Precision				
Intra-Laboratory Field Duplicates	1/20 samples	Yes. 1 intra-laboratory duplicates for 10 primary soil samples.	>5xLOR: 50% RPD	NA- Given the preliminary nature of the investigation, the collection of intra-laboratory field duplicate samples was not considered warranted.
Inter-Laboratory Field Duplicates	1/20 samples	Yes. 1 inter-laboratory duplicate for 10 primary soil samples. Partial.	>5xLOR: 50% RPD	NA- Given the preliminary nature of the investigation, the collection of inter-laboratory field duplicate samples was not considered warranted.
Laboratory duplicates	1/20 samples	Yes	>5xLOR: 50% RPD	Yes
Laboratory method blanks	1/10 samples	Yes	< LOR Not required for asbestos	Yes
Accuracy				
Matrix spikes	1/10 samples	Yes	Acceptable recoveries: 70 to 130% for metals and inorganics 60-140% for organics 10-140% for sVOC and speciated phenols Not required for asbestos	Yes.
Laboratory control spike	1/10 samples	Yes	As Matrix spikes Not required for asbestos	Yes.
Surrogate spike	1/10 samples	Yes	As Matrix spikes Not required for asbestos	Yes.
Representativeness				
Sampling handling storage and transport appropriate for media and analytes	All	Yes	Received by the laboratories, cooled and with containers in good condition	Yes
Rinsate blanks	NA	NA	<LOR	NA
Trip Spike and Trip Blank	1 per media	NA	<LOR/as specified by laboratory	NA
Samples extracted and analysed within holding times.	All	Yes	Hold Times: 7 days - organics 6 months – inorganics	Yes
Comparability				
Standard operating procedures used for sample collection and handling (including decontamination)	All Samples	Yes	Yes	Yes

AU124119 R01

Data Quality Objective	Sampling Frequency	Frequency Achieved?	DQI	DQI Met?
Standard analytical methods used for all analyses	All Samples	Yes	Yes	Yes
Consistent field conditions, sampling staff and laboratory analysis	All Samples	Yes	Yes	Yes
Limits of reporting appropriate and consistent	All Samples	Yes	Yes	Yes
Completeness				
Soil description and COCs completed and appropriate	All Samples	Yes	Yes	Yes, borehole logs and laboratory certificates are presented in Appendices D and E, respectively.
Appropriate documentation for testing	All Samples	Yes	Yes	Yes
Data set to be 95% complete after validation	All Samples	Yes	Yes	Yes

Appendix G Laboratory Certificates

COC: 04/08/24, 0943

CHAIN OF CUSTODY FORM - Client

ENVIROLAB GROUP
National phone number 1300 424 344
Sydney Lab - Envirolab Services
12 Ashley St, Chatswood, NSW 2067
✆ 02 9910 6200 | ✉ sydney@envirolab.com.au

Perth Lab - MPL Laboratories
16-18 Hayden Crt, Myaree, WA 6154
✆ 08 9317 2505 | ✉ lab@mpl.com.au

Melbourne Lab - Envirolab Services
25 Research Drive, Croydon South, VIC 3136
✆ 03 9763 2500 | ✉ melbourne@envirolab.com.au

Adelaide Office - Envirolab Services
7a The Parade, Norwood, SA 5067
✆ 08 7087 6800 | ✉ adelaide@envirolab.com.au

Brisbane Office - Envirolab Services
20a, 10-20 Depot St, Banyo, QLD 4014
✆ 07 3266 9532 | ✉ brisbane@envirolab.com.au

Darwin Office - Envirolab Services
Unit 20/119 Reichardt Road, Winnellie, NT 0820
✆ 08 8967 1201 | ✉ darwin@envirolab.com.au

Company:	Geosyntec	Client Project Name/Number/Site etc (ie report title):	AU124119
Contact Person:	Chris Navaratnam	PO No. (if applicable):	410001068
Project Mgr:	Priya Dass	Envirolab Quote No. :	
Sampler:	Chris Navaratnam	Date results required:	Or choose: ☑ Standard ☐ Same Day ☐ 1 day ☐ 2 day ☐ 3 day
Address:	Suite 3.04, 1 York Street, Sydney NSW 2000		
Phone:	61 (02) 9251 8070 Mob: 0420400304	Note: Inform lab in advance if urgent turnaround is required - surcharges apply	
Email Results to:	christopher.navaratnam@geosyntec.com priya.dass@geosyntec.com	Additional report format:	☑ Esdat ☐ Equis
Email Invoice to:	christopher.navaratnam@geosyntec.com priya.dass@geosyntec.com	Lab Comments:	

Envirolab Sample ID (Lab use only)	Client Sample ID or Information	Depth	Date Sampled	Type of Sample	Combination 3 AN	Organochlorine Pesticides (OCP)	Combination 3 (Total)	Organochlorine Pesticides (OCP-Water)	Combination 3	On Hold	Ammonia	Phosphate	Nitrate	Nitrite	Comments
1	BH101_0-0.1		09.08.2024	Soil	X	X									
2	BH102_0.1-0.2		09.08.2024	Soil	X	X									
3	BH103_0.1-0.2		09.08.2024	Soil	X	X									
4	BH104_0.2-0.3		09.08.2024	Soil	X	X									
5	BH105_0-0.1		09.08.2024	Soil	X	X									
6	BH106_0-0.1		09.08.2024	Soil	X	X									
7	SS1		09.08.2024	Soil						X					
8	SED1		09.08.2024	Soil		X			X						
9	SED2		09.08.2024	Soil		X			X						
10	SW1E		09.08.2024	Water			X	X			X	X	X	X	
11	SW2W		09.08.2024	Water			X	X			X	X	X	X	

☐ *Please tick the box if observed settled sediment present in water samples is to be included in the extraction and/or analysis*

Relinquished by (Company):	Geosyntec	Received by (Company):	ES JHD	Lab Use Only	350710
Print Name:	Chris Navaratnam	Print Name:	Christine HD	Job number:	Cooling: Ice / Ice pack / None
Date & Time:	09.08.24	Date & Time:	9/8/24 1630	Temperature:	2°C Security seal: Intact / Broken / None
Signature:		Signature:		TAT Req - SAME day / 1 / 2 / 3 / 4 / STD	

Form 302_V007 Issue date: 21 April 2021

ENVIROLAB GROUP | ENVIROLAB SERVICES | mpl

CHAIN OF CUSTODY FORM - Client

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ENVIROLAB GROUP
National phone number 1300 424 344

Sydney Lab - Envirolab Services
12 Ashley St, Chatswood, NSW 2067
① 02 9910 6200 | sydney@envirolab.com.au

Perth Lab - MPL Laboratories
16-18 Hayden Crt, Myaree, WA 6154
① 08 9317 2505 | lab@mpl.com.au

Melbourne Lab - Envirolab Services
25 Research Drive, Croydon South, VIC 3136
① 03 9763 2500 | melbourne@envirolab.com.au

Adelaide Office - Envirolab Services
7a The Parade, Norwood, SA 5067
① 08 7087 6800 | adelaide@envirolab.com.au

Brisbane Office - Envirolab Services
20a, 10-20 Depot St, Banyo, QLD 4014
① 07 3266 9532 | brisbane@envirolab.com.au

Darwin Office - Envirolab Services
Unit 20/119 Reichardt Road, Winnellie, NT 0820
① 08 8967 1201 | darwin@envirolab.com.au

Company:	Geosyntec Consultants	Client Project Name/Number/Site etc (ie report title):	AU124119
Contact Person:	Chris. Navaratnam	PO No. (if applicable):	
Project Mgr:	Priya Dass	Envirolab Quote No. :	
Sampler:	Chris Navaratnam	Date results required:	
Address:	Suite 3.04 / 1 York St, Sydney, NSW	Or choose: Standard / Same Day / 1 day / 2 day / 3 day	
Phone:	Mob: 0420400304 -	Note: Inform lab in advance if urgent turnaround is required - surcharges apply	
Email Results to:	Christopher.navaratnam@geosyntec.com	Additional report format: Esdat / Equis	
Email Invoice to:		Lab Comments:	

Sample information					Tests Required	Comments
Envirolab Sample ID (Lab use only)	Client Sample ID or Information	Depth	Date Sampled	Type of Sample		Provide as much information about the sample as you can
	All Samples on Hold. Formal COC to be Sent via Email					

☐ *Please tick the box if observed settled sediment present in water samples is to be included in the extraction and/or analysis*

Relinquished by (Company):	Geosyntec	Received by (Company):	
Print Name:	Chris. Navaratnam	Print Name:	
Date & Time:	4:30pm / 8/8/24	Date & Time:	(630)
Signature:		Signature:	

Lab Use Only

Job number: 358776	Cooling: Ice / Ice pack / None
Temperature:	Security seal: Intact / Broken / None
TAT Req - SAME day / 1 / 2 / 3 / 4 / STD	

Form 302_V007 (Envirolab Group) Issue date: 21 April 2021 Page 1 of 1

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

SAMPLE RECEIPT ADVICE

Client Details	
Client	Geosyntec
Attention	Chris Navaratnam

Sample Login Details	
Your reference	AU124119
Envirolab Reference	358770
Date Sample Received	08/08/2024
Date Instructions Received	09/08/2024
Date Results Expected to be Reported	16/08/2024

Sample Condition	
Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	9 Soil, 2 Water
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	2
Cooling Method	Ice
Sampling Date Provided	YES

Comments
Nil

Please direct any queries to:

Aileen Hie	Jacinta Hurst
Phone: 02 9910 6200	**Phone: 02 9910 6200**
Fax: 02 9910 6201	**Fax: 02 9910 6201**
Email: ahie@envirolab.com.au	**Email: jhurst@envirolab.com.au**

Analysis Underway, details on the following page:

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

Sample ID	vTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	PAHs in Soil	Organochlorine Pesticides in soil	Acid Extractable metalsin soil	Asbestos ID - soils NEPM - ASB-001	vTRH(C6-C10)/BTEXN in Water	svTRH (C10-C40) in Water	PAHs in Water	Organochlorine Pesticides in Water	HM in water - total	Ammonia as N in water	Phosphate as P in water	Nitrate as N in water	Nitrite as N in water	On Hold
BH101_0-0.1	✓	✓	✓	✓	✓	✓										
BH102_0.1-0.2	✓	✓	✓	✓	✓	✓										
BH103_0.1-0.2	✓	✓	✓	✓	✓	✓										
BH104_0.2-0.3	✓	✓	✓	✓	✓	✓										
BH105_0-0.1	✓	✓	✓	✓	✓	✓										
BH106_0-0.1	✓	✓	✓	✓	✓	✓										
SS1																✓
SED1	✓	✓	✓	✓	✓											
SED2	✓	✓	✓	✓	✓											
SW1E							✓	✓	✓	✓	✓	✓	✓	✓	✓	
SW2W							✓	✓	✓	✓	✓	✓	✓	✓	✓	

The '✓' indicates the testing you have requested. **THIS IS NOT A REPORT OF THE RESULTS.**

Additional Info
Sample storage - Waters are routinely disposed of approximately 1 month and soils approximately 2 months from receipt.
Requests for longer term sample storage must be received in writing.
Please contact the laboratory immediately if observed settled sediment present in water samples is to be included in the extraction and/or analysis (exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS analysis where solids are included by default.
TAT for Micro is dependent on incubation. This varies from 3 to 6 days.

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

CERTIFICATE OF ANALYSIS 358770

Client Details

Client	Geosyntec
Attention	Chris Navaratnam
Address	Suite 3.04, 1 York Street, Sydney, NSW, 2000

Sample Details

Your Reference	**AU124119**
Number of Samples	9 Soil, 2 Water
Date samples received	08/08/2024
Date completed instructions received	09/08/2024

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Please refer to the last page of this report for any comments relating to the results.

Report Details

Date results requested by	16/08/2024
Date of Issue	16/08/2024

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Asbestos Approved By
Analysed by Asbestos Approved Analyst: Lucy Zhu
Authorised by Asbestos Approved Signatory: Lucy Zhu

Results Approved By
Dragana Tomas, Senior Chemist
Giovanni Agosti, Group Technical Manager
Jack Wallis, Chemist (FAS)
Jenny He, Senior Chemist
Liam Timmins, Organics Supervisor
Lucy Zhu, Asbestos Supervisor
Timothy Toll, Senior Chemist

Authorised By
Nancy Zhang, Laboratory Manager

Client Reference: AU124119

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		358770-1	358770-2	358770-3	358770-4	358770-5
Your Reference	UNITS	BH101_0-0.1	BH102_0.1-0.2	BH103_0.1-0.2	BH104_0.2-0.3	BH105_0-0.1
Date Sampled		09/08/2024	09/08/2024	09/08/2024	09/08/2024	09/08/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	12/08/2024	12/08/2024	12/08/2024	12/08/2024	12/08/2024
Date analysed	-	13/08/2024	13/08/2024	13/08/2024	13/08/2024	13/08/2024
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTRH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	99	97	89	93	97

vTRH(C6-C10)/BTEXN in Soil				
Our Reference		358770-6	358770-8	358770-9
Your Reference	UNITS	BH106_0-0.1	SED1	SED2
Date Sampled		09/08/2024	09/08/2024	09/08/2024
Type of sample		Soil	Soil	Soil
Date extracted	-	12/08/2024	12/08/2024	12/08/2024
Date analysed	-	13/08/2024	13/08/2024	13/08/2024
TRH C_6 - C_9	mg/kg	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25
vTRH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1
Naphthalene	mg/kg	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	95	78	77

Client Reference: AU124119

svTRH (C10-C40) in Soil						
Our Reference		358770-1	358770-2	358770-3	358770-4	358770-5
Your Reference	UNITS	BH101_0-0.1	BH102_0.1-0.2	BH103_0.1-0.2	BH104_0.2-0.3	BH105_0-0.1
Date Sampled		09/08/2024	09/08/2024	09/08/2024	09/08/2024	09/08/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	12/08/2024	12/08/2024	12/08/2024	12/08/2024	12/08/2024
Date analysed	-	12/08/2024	12/08/2024	12/08/2024	12/08/2024	12/08/2024
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (C10-C36)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} -C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100	<100	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	89	88	87	86	86

svTRH (C10-C40) in Soil				
Our Reference		358770-6	358770-8	358770-9
Your Reference	UNITS	BH106_0-0.1	SED1	SED2
Date Sampled		09/08/2024	09/08/2024	09/08/2024
Type of sample		Soil	Soil	Soil
Date extracted	-	12/08/2024	12/08/2024	12/08/2024
Date analysed	-	12/08/2024	13/08/2024	13/08/2024
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	120	140
Total +ve TRH (C10-C36)	mg/kg	<50	120	140
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50
TRH >C_{10} -C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100	140
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	140
Surrogate o-Terphenyl	%	85	89	98

Client Reference: AU124119

PAHs in Soil						
Our Reference		358770-1	358770-2	358770-3	358770-4	358770-5
Your Reference	UNITS	BH101_0-0.1	BH102_0.1-0.2	BH103_0.1-0.2	BH104_0.2-0.3	BH105_0-0.1
Date Sampled		09/08/2024	09/08/2024	09/08/2024	09/08/2024	09/08/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	12/08/2024	12/08/2024	12/08/2024	12/08/2024	12/08/2024
Date analysed	-	12/08/2024	12/08/2024	12/08/2024	12/08/2024	12/08/2024
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PAH's	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	95	95	92	88	98

Client Reference: AU124119

PAHs in Soil				
Our Reference		358770-6	358770-8	358770-9
Your Reference	UNITS	BH106_0-0.1	SED1	SED2
Date Sampled		09/08/2024	09/08/2024	09/08/2024
Type of sample		Soil	Soil	Soil
Date extracted	-	12/08/2024	12/08/2024	12/08/2024
Date analysed	-	12/08/2024	12/08/2024	12/08/2024
Naphthalene	mg/kg	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1
Total +ve PAH's	mg/kg	<0.05	<0.05	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	97	99	120

Client Reference: AU124119

Organochlorine Pesticides in soil						
Our Reference		358770-1	358770-2	358770-3	358770-4	358770-5
Your Reference	UNITS	BH101_0-0.1	BH102_0.1-0.2	BH103_0.1-0.2	BH104_0.2-0.3	BH105_0-0.1
Date Sampled		09/08/2024	09/08/2024	09/08/2024	09/08/2024	09/08/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	12/08/2024	12/08/2024	12/08/2024	12/08/2024	12/08/2024
Date analysed	-	12/08/2024	12/08/2024	12/08/2024	12/08/2024	12/08/2024
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Mirex	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate 4-Chloro-3-NBTF	%	96	98	103	97	94
Total Positive Aldrin+Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1

Client Reference: AU124119

Organochlorine Pesticides in soil				
Our Reference		358770-6	358770-8	358770-9
Your Reference	UNITS	BH106_0-0.1	SED1	SED2
Date Sampled		09/08/2024	09/08/2024	09/08/2024
Type of sample		Soil	Soil	Soil
Date extracted	-	12/08/2024	12/08/2024	12/08/2024
Date analysed	-	12/08/2024	12/08/2024	12/08/2024
alpha-BHC	mg/kg	<0.1	<0.1	<0.1
HCB	mg/kg	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1
Mirex	mg/kg	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1
Surrogate 4-Chloro-3-NBTF	%	86	84	91
Total Positive Aldrin+Dieldrin	mg/kg	<0.1	<0.1	<0.1

Client Reference: AU124119

Acid Extractable metals in soil						
Our Reference		358770-1	358770-2	358770-3	358770-4	358770-5
Your Reference	UNITS	BH101_0-0.1	BH102_0.1-0.2	BH103_0.1-0.2	BH104_0.2-0.3	BH105_0-0.1
Date Sampled		09/08/2024	09/08/2024	09/08/2024	09/08/2024	09/08/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	09/08/2024	09/08/2024	09/08/2024	09/08/2024	09/08/2024
Date analysed	-	13/08/2024	13/08/2024	13/08/2024	13/08/2024	13/08/2024
Arsenic	mg/kg	<4	<4	<4	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	3	7	5	7	5
Copper	mg/kg	2	2	2	1	3
Lead	mg/kg	4	5	5	6	6
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	<1	2	1	1	2
Zinc	mg/kg	7	5	3	4	6

Acid Extractable metals in soil				
Our Reference		358770-6	358770-8	358770-9
Your Reference	UNITS	BH106_0-0.1	SED1	SED2
Date Sampled		09/08/2024	09/08/2024	09/08/2024
Type of sample		Soil	Soil	Soil
Date prepared	-	09/08/2024	09/08/2024	09/08/2024
Date analysed	-	13/08/2024	13/08/2024	13/08/2024
Arsenic	mg/kg	<4	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4
Chromium	mg/kg	19	24	30
Copper	mg/kg	2	9	10
Lead	mg/kg	6	9	9
Mercury	mg/kg	<0.1	<0.1	<0.1
Nickel	mg/kg	2	9	10
Zinc	mg/kg	5	27	22

Client Reference: AU124119

Moisture						
Our Reference		358770-1	358770-2	358770-3	358770-4	358770-5
Your Reference	UNITS	BH101_0-0.1	BH102_0.1-0.2	BH103_0.1-0.2	BH104_0.2-0.3	BH105_0-0.1
Date Sampled		09/08/2024	09/08/2024	09/08/2024	09/08/2024	09/08/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	12/08/2024	12/08/2024	12/08/2024	12/08/2024	12/08/2024
Date analysed	-	13/08/2024	13/08/2024	13/08/2024	13/08/2024	13/08/2024
Moisture	%	13	16	16	12	17

Moisture				
Our Reference		358770-6	358770-8	358770-9
Your Reference	UNITS	BH106_0-0.1	SED1	SED2
Date Sampled		09/08/2024	09/08/2024	09/08/2024
Type of sample		Soil	Soil	Soil
Date prepared	-	12/08/2024	12/08/2024	12/08/2024
Date analysed	-	13/08/2024	13/08/2024	13/08/2024
Moisture	%	13	55	56

Client Reference: AU124119

Asbestos ID - soils NEPM - ASB-001						
Our Reference		358770-1	358770-2	358770-3	358770-4	358770-5
Your Reference	UNITS	BH101_0-0.1	BH102_0.1-0.2	BH103_0.1-0.2	BH104_0.2-0.3	BH105_0-0.1
Date Sampled		09/08/2024	09/08/2024	09/08/2024	09/08/2024	09/08/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	15/08/2024	15/08/2024	15/08/2024	15/08/2024	15/08/2024
Sample mass tested	g	780.41	740.36	885.35	831.55	615.23
Sample Description	-	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks
Asbestos ID in soil (AS4964) >0.1g/kg	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected
Total Asbestos[#1]	g/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Asbestos ID in soil <0.1g/kg*	-	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected
ACM >7mm Estimation*	g	–	–	–	–	–
FA and AF Estimation*	g	–	–	–	–	–
ACM >7mm Estimation*	%(w/w)	<0.01	<0.01	<0.01	<0.01	<0.01
FA and AF Estimation*#2	%(w/w)	<0.001	<0.001	<0.001	<0.001	<0.001
Asbestos comments	-	Nil	Nil	Nil	Nil	Nil

Client Reference: AU124119

Asbestos ID - soils NEPM - ASB-001		
Our Reference	UNITS	358770-6
Your Reference		BH106_0-0.1
Date Sampled		09/08/2024
Type of sample		Soil
Date analysed	-	15/08/2024
Sample mass tested	g	901.25
Sample Description	-	Brown fine-grained soil & rocks
Asbestos ID in soil (AS4964) >0.1g/kg	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected
Total Asbestos#1	g/kg	<0.1
Asbestos ID in soil <0.1g/kg*	-	No visible asbestos detected
ACM >7mm Estimation*	g	–
FA and AF Estimation*	g	–
ACM >7mm Estimation*	%(w/w)	<0.01
FA and AF Estimation*#2	%(w/w)	<0.001
Asbestos comments	-	Nil

Client Reference: AU124119

vTRH(C6-C10)/BTEXN in Water			
Our Reference		358770-10	358770-11
Your Reference	UNITS	SW1E	SW2W
Date Sampled		09/08/2024	09/08/2024
Type of sample		Water	Water
Date extracted	-	12/08/2024	12/08/2024
Date analysed	-	13/08/2024	13/08/2024
TRH C_6 - C_9	µg/L	<10	<10
TRH C_6 - C_{10}	µg/L	<10	<10
TRH C_6 - C_{10} less BTEX (F1)	µg/L	<10	<10
Benzene	µg/L	<1	<1
Toluene	µg/L	<1	<1
Ethylbenzene	µg/L	<1	<1
m+p-xylene	µg/L	<2	<2
o-xylene	µg/L	<1	<1
Naphthalene	µg/L	<1	<1
Surrogate Dibromofluoromethane	%	92	94
Surrogate Toluene-d8	%	99	100
Surrogate 4-Bromofluorobenzene	%	96	92

Client Reference: AU124119

svTRH (C10-C40) in Water			
Our Reference		358770-10	358770-11
Your Reference	UNITS	SW1E	SW2W
Date Sampled		09/08/2024	09/08/2024
Type of sample		Water	Water
Date extracted	-	12/08/2024	12/08/2024
Date analysed	-	13/08/2024	12/08/2024
TRH C_{10} - C_{14}	µg/L	180	<50
TRH C_{15} - C_{28}	µg/L	380	<100
TRH C_{29} - C_{36}	µg/L	550	<100
Total +ve TRH (C10-C36)	µg/L	1,100	<50
TRH >C_{10} - C_{16}	µg/L	190	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	µg/L	190	<50
TRH >C_{16} - C_{34}	µg/L	780	<100
TRH >C_{34} - C_{40}	µg/L	160	<100
Total +ve TRH (>C10-C40)	µg/L	1,100	<50
Surrogate o-Terphenyl	%	80	97

Client Reference: AU124119

PAHs in Water			
Our Reference		358770-10	358770-11
Your Reference	UNITS	SW1E	SW2W
Date Sampled		09/08/2024	09/08/2024
Type of sample		Water	Water
Date extracted	-	12/08/2024	12/08/2024
Date analysed	-	13/08/2024	13/08/2024
Naphthalene	µg/L	<0.1	<0.1
Acenaphthylene	µg/L	<0.1	<0.1
Acenaphthene	µg/L	<0.1	<0.1
Fluorene	µg/L	<0.1	<0.1
Phenanthrene	µg/L	<0.1	<0.1
Anthracene	µg/L	<0.1	<0.1
Fluoranthene	µg/L	<0.1	<0.1
Pyrene	µg/L	<0.1	<0.1
Benzo(a)anthracene	µg/L	<0.1	<0.1
Chrysene	µg/L	<0.1	<0.1
Benzo(b,j+k)fluoranthene	µg/L	<0.2	<0.2
Benzo(a)pyrene	µg/L	<0.1	<0.1
Indeno(1,2,3-c,d)pyrene	µg/L	<0.1	<0.1
Dibenzo(a,h)anthracene	µg/L	<0.1	<0.1
Benzo(g,h,i)perylene	µg/L	<0.1	<0.1
Benzo(a)pyrene TEQ	µg/L	<0.5	<0.5
Total +ve PAH's	µg/L	<0.1	<0.1
Surrogate p-Terphenyl-d14	%	91	86

Client Reference: AU124119

Organochlorine Pesticides in Water			
Our Reference		358770-10	358770-11
Your Reference	UNITS	SW1E	SW2W
Date Sampled		09/08/2024	09/08/2024
Type of sample		Water	Water
Date extracted	-	12/08/2024	12/08/2024
Date analysed	-	13/08/2024	13/08/2024
alpha-BHC	µg/L	<0.2	<0.2
HCB	µg/L	<0.2	<0.2
beta-BHC	µg/L	<0.2	<0.2
gamma-BHC	µg/L	<0.2	<0.2
Heptachlor	µg/L	<0.2	<0.2
delta-BHC	µg/L	<0.2	<0.2
Aldrin	µg/L	<0.2	<0.2
Heptachlor Epoxide	µg/L	<0.2	<0.2
gamma-Chlordane	µg/L	<0.2	<0.2
alpha-Chlordane	µg/L	<0.2	<0.2
Endosulfan I	µg/L	<0.2	<0.2
pp-DDE	µg/L	<0.2	<0.2
Dieldrin	µg/L	<0.2	<0.2
Endrin	µg/L	<0.2	<0.2
Endosulfan II	µg/L	<0.2	<0.2
pp-DDD	µg/L	<0.2	<0.2
Endrin Aldehyde	µg/L	<0.2	<0.2
pp-DDT	µg/L	<0.2	<0.2
Endosulfan Sulphate	µg/L	<0.2	<0.2
Methoxychlor	µg/L	<0.2	<0.2
Mirex	ug/L	<0.2	<0.2
Surrogate 4-Chloro-3-NBTF	%	86	85

Client Reference: AU124119

HM in water - total			
Our Reference		358770-10	358770-11
Your Reference	UNITS	SW1E	SW2W
Date Sampled		09/08/2024	09/08/2024
Type of sample		Water	Water
Date prepared	-	12/08/2024	12/08/2024
Date analysed	-	12/08/2024	12/08/2024
Arsenic-Total	µg/L	18	<1
Cadmium-Total	µg/L	0.3	<0.1
Chromium-Total	µg/L	84	<1
Copper-Total	µg/L	51	<1
Lead-Total	µg/L	49	<1
Mercury-Total	µg/L	<0.05	<0.05
Nickel-Total	µg/L	43	<1
Zinc-Total	µg/L	160	1

Client Reference: AU124119

Miscellaneous Inorganics			
Our Reference		358770-10	358770-11
Your Reference	UNITS	SW1E	SW2W
Date Sampled		09/08/2024	09/08/2024
Type of sample		Water	Water
Date prepared	-	09/08/2024	09/08/2024
Date analysed	-	09/08/2024	09/08/2024
Ammonia as N in water	mg/L	<0.005	<0.005
Phosphate as P in water	mg/L	0.005	<0.005
Nitrate as N in water	mg/L	2.3	4.4
Nitrite as N in water	mg/L	0.042	0.008

Client Reference: AU124119

Method ID	Methodology Summary
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.
ASB-001	Asbestos ID - Identification of asbestos in soil samples using Polarised Light Microscopy and Dispersion Staining Techniques. Minimum 500mL soil sample was analysed as recommended by "National Environment Protection (Assessment of site contamination) Measure, Schedule B1 and "The Guidelines from the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia - May 2009" with a reporting limit of 0.1g/kg (0.01% w/w) as per Australian Standard AS4964-2004. Results reported denoted with * are outside our scope of NATA accreditation. NOTE#1 Total Asbestos g/kg was analysed and reported as per Australian Standard AS4964 (This is the sum of ACM >7mm, <7mm and FA/AF relative to the sample mass tested) NOTE#2 The screening level of 0.001% w/w asbestos in soil for FA and AF only applies where the FA and AF are able to be quantified by gravimetric procedures. This screening level is not applicable to free fibres. Estimation = Estimated asbestos weight Results reported with "--" is equivalent to no visible asbestos identified using Polarised Light microscopy and Dispersion Staining Techniques.
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
Inorg-055	Nitrate - determined colourimetrically. Waters samples are filtered on receipt prior to analysis. Soils are analysed following a water extraction.
Inorg-055	Nitrite - determined colourimetrically based on APHA latest edition NO2- B. Waters samples are filtered on receipt prior to analysis. Soils are analysed following a water extraction.
Inorg-057	Ammonia - determined colourimetrically, based on APHA latest edition 4500-NH3 F. Waters samples are filtered on receipt prior to analysis. Soils are analysed following a KCl extraction.
Inorg-060	Phosphate determined colourimetrically based on EPA365.1 and APHA latest edition 4500 P E. Waters samples are filtered on receipt prior to analysis. Soils are analysed following a water extraction.
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.

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Method ID	Methodology Summary
Metals-022	Determination of various metals by ICP-MS. Please note for Bromine and Iodine, any forms of these elements that are present are included together in the one result reported for each of these two elements. Salt forms (e.g. FeO, PbO, ZnO) are determined stoichiometrically from the base metal concentration.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis. Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (>C10-C40).
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS.
Org-022/025	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-MS/GC-MSMS. Note, the Total +ve reported DDD+DDE+DDT PQL is reflective of the lowest individual PQL and is therefore simply a sum of the positive individually report DDD+DDE+DDT.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS and/or GC-MS/MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013. For soil results:- 1. 'EQ PQL'values are assuming all contributing PAHs reported as <PQL are actually at the PQL. This is the most conservative approach and can give false positive TEQs given that PAHs that contribute to the TEQ calculation may not be present. 2. 'EQ zero'values are assuming all contributing PAHs reported as <PQL are zero. This is the least conservative approach and is more susceptible to false negative TEQs when PAHs that contribute to the TEQ calculation are present but below PQL. 3. 'EQ half PQL'values are assuming all contributing PAHs reported as <PQL are half the stipulated PQL. Hence a mid-point between the most and least conservative approaches above. Note, the Total +ve PAHs PQL is reflective of the lowest individual PQL and is therefore "Total +ve PAHs" is simply a sum of the positive individual PAHs.
Org-023	Water samples are analysed directly by purge and trap GC-MS.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.

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Method ID	Methodology Summary
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater. Note, the Total +ve Xylene PQL is reflective of the lowest individual PQL and is therefore "Total +ve Xylenes" is simply a sum of the positive individual Xylenes.

Client Reference: AU124119

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	358770-2
Date extracted	-			12/08/2024	1	12/08/2024	12/08/2024		12/08/2024	12/08/2024
Date analysed	-			13/08/2024	1	13/08/2024	13/08/2024		13/08/2024	13/08/2024
TRH C_6 - C_9	mg/kg	25	Org-023	<25	1	<25	<25	0	98	86
TRH C_6 - C_{10}	mg/kg	25	Org-023	<25	1	<25	<25	0	98	86
Benzene	mg/kg	0.2	Org-023	<0.2	1	<0.2	<0.2	0	93	82
Toluene	mg/kg	0.5	Org-023	<0.5	1	<0.5	<0.5	0	94	82
Ethylbenzene	mg/kg	1	Org-023	<1	1	<1	<1	0	99	87
m+p-xylene	mg/kg	2	Org-023	<2	1	<2	<2	0	101	89
o-Xylene	mg/kg	1	Org-023	<1	1	<1	<1	0	100	88
Naphthalene	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	101	1	99	92	7	97	82

Client Reference: AU124119

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	358770-2
Date extracted	-			12/08/2024	1	12/08/2024	12/08/2024		12/08/2024	12/08/2024
Date analysed	-			12/08/2024	1	12/08/2024	12/08/2024		12/08/2024	12/08/2024
TRH C_{10} - C_{14}	mg/kg	50	Org-020	<50	1	<50	<50	0	111	120
TRH C_{15} - C_{28}	mg/kg	100	Org-020	<100	1	<100	<100	0	100	107
TRH C_{29} - C_{36}	mg/kg	100	Org-020	<100	1	<100	<100	0	86	90
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	<50	1	<50	<50	0	111	120
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	<100	1	<100	<100	0	100	107
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	<100	1	<100	<100	0	86	90
Surrogate o-Terphenyl	%		Org-020	83	1	89	86	3	91	94

Client Reference: AU124119

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	358770-2
Date extracted	-			12/08/2024	1	12/08/2024	12/08/2024		12/08/2024	12/08/2024
Date analysed	-			12/08/2024	1	12/08/2024	12/08/2024		12/08/2024	12/08/2024
Naphthalene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	86	80
Acenaphthylene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	96	90
Fluorene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	82	78
Phenanthrene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	96	92
Anthracene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	90	88
Pyrene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	90	84
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	64	64
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	<0.05	1	<0.05	<0.05	0	82	86
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	85	1	95	94	1	90	87

Client Reference: AU124119

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	358770-2
Date extracted	-			12/08/2024	1	12/08/2024	12/08/2024		12/08/2024	12/08/2024
Date analysed	-			12/08/2024	1	12/08/2024	12/08/2024		12/08/2024	12/08/2024
alpha-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	82	86
HCB	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	78	80
gamma-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	86	82
delta-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	98	88
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	102	104
gamma-Chlordane	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	98	88
Dieldrin	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	122	112
Endrin	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	114	132
Endosulfan II	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	80	80
Endrin Aldehyde	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	94	89
Methoxychlor	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Mirex	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate 4-Chloro-3-NBTF	%		Org-022/025	96	1	96	96	0	96	96

Client Reference: AU124119

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	358770-2
Date prepared	-			09/08/2024	1	09/08/2024	09/08/2024		09/08/2024	09/08/2024
Date analysed	-			13/08/2024	1	13/08/2024	13/08/2024		13/08/2024	13/08/2024
Arsenic	mg/kg	4	Metals-020	<4	1	<4	<4	0	109	91
Cadmium	mg/kg	0.4	Metals-020	<0.4	1	<0.4	<0.4	0	101	87
Chromium	mg/kg	1	Metals-020	<1	1	3	3	0	101	90
Copper	mg/kg	1	Metals-020	<1	1	2	2	0	103	95
Lead	mg/kg	1	Metals-020	<1	1	4	5	22	107	93
Mercury	mg/kg	0.1	Metals-021	<0.1	1	<0.1	<0.1	0	98	94
Nickel	mg/kg	1	Metals-020	<1	1	<1	<1	0	109	96
Zinc	mg/kg	1	Metals-020	<1	1	7	8	13	103	87

Client Reference: AU124119

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Water					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W3	[NT]
Date extracted	-			12/08/2024	[NT]	[NT]	[NT]	[NT]	12/08/2024	[NT]
Date analysed	-			13/08/2024	[NT]	[NT]	[NT]	[NT]	13/08/2024	[NT]
TRH C_6 - C_9	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	109	[NT]
TRH C_6 - C_{10}	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	109	[NT]
Benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	112	[NT]
Toluene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	109	[NT]
Ethylbenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	107	[NT]
m+p-xylene	µg/L	2	Org-023	<2	[NT]	[NT]	[NT]	[NT]	108	[NT]
o-xylene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	109	[NT]
Naphthalene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-023	99	[NT]	[NT]	[NT]	[NT]	101	[NT]
Surrogate Toluene-d8	%		Org-023	99	[NT]	[NT]	[NT]	[NT]	99	[NT]
Surrogate 4-Bromofluorobenzene	%		Org-023	98	[NT]	[NT]	[NT]	[NT]	101	[NT]

Client Reference: AU124119

QUALITY CONTROL: svTRH (C10-C40) in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			12/08/2024	10	12/08/2024	12/08/2024		12/08/2024	[NT]
Date analysed	-			12/08/2024	10	13/08/2024	13/08/2024		12/08/2024	[NT]
TRH C_{10} - C_{14}	µg/L	50	Org-020	<50	10	180	<50	113	101	[NT]
TRH C_{15} - C_{28}	µg/L	100	Org-020	<100	10	380	160	81	101	[NT]
TRH C_{29} - C_{36}	µg/L	100	Org-020	<100	10	550	130	124	100	[NT]
TRH >C_{10} - C_{16}	µg/L	50	Org-020	<50	10	190	<50	117	101	[NT]
TRH >C_{16} - C_{34}	µg/L	100	Org-020	<100	10	780	240	106	101	[NT]
TRH >C_{34} - C_{40}	µg/L	100	Org-020	<100	10	160	<100	46	100	[NT]
Surrogate o-Terphenyl	%		Org-020	82	10	80	101	23	109	[NT]

Client Reference: AU124119

QUALITY CONTROL: PAHs in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W3	[NT]
Date extracted	-			12/08/2024	11	12/08/2024	12/08/2024		12/08/2024	[NT]
Date analysed	-			13/08/2024	11	13/08/2024	13/08/2024		13/08/2024	[NT]
Naphthalene	µg/L	0.1	Org-022/025	<0.1	11	<0.1	<0.1	0	74	[NT]
Acenaphthylene	µg/L	0.1	Org-022/025	<0.1	11	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	µg/L	0.1	Org-022/025	<0.1	11	<0.1	<0.1	0	81	[NT]
Fluorene	µg/L	0.1	Org-022/025	<0.1	11	<0.1	<0.1	0	76	[NT]
Phenanthrene	µg/L	0.1	Org-022/025	<0.1	11	<0.1	<0.1	0	80	[NT]
Anthracene	µg/L	0.1	Org-022/025	<0.1	11	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	µg/L	0.1	Org-022/025	<0.1	11	<0.1	<0.1	0	78	[NT]
Pyrene	µg/L	0.1	Org-022/025	<0.1	11	<0.1	<0.1	0	73	[NT]
Benzo(a)anthracene	µg/L	0.1	Org-022/025	<0.1	11	<0.1	<0.1	0	[NT]	[NT]
Chrysene	µg/L	0.1	Org-022/025	<0.1	11	<0.1	<0.1	0	79	[NT]
Benzo(b,j+k)fluoranthene	µg/L	0.2	Org-022/025	<0.2	11	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	µg/L	0.1	Org-022/025	<0.1	11	<0.1	<0.1	0	74	[NT]
Indeno(1,2,3-c,d)pyrene	µg/L	0.1	Org-022/025	<0.1	11	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	µg/L	0.1	Org-022/025	<0.1	11	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	µg/L	0.1	Org-022/025	<0.1	11	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	86	11	86	79	8	94	[NT]

Client Reference: AU124119

QUALITY CONTROL: Organochlorine Pesticides in Water					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W3	[NT]
Date extracted	-			12/08/2024	11	12/08/2024	12/08/2024		12/08/2024	[NT]
Date analysed	-			13/08/2024	11	13/08/2024	13/08/2024		13/08/2024	[NT]
alpha-BHC	µg/L	0.2	Org-022/025	<0.2	11	<0.2	<0.2	0	81	[NT]
HCB	µg/L	0.2	Org-022/025	<0.2	11	<0.2	<0.2	0	[NT]	[NT]
beta-BHC	µg/L	0.2	Org-022/025	<0.2	11	<0.2	<0.2	0	75	[NT]
gamma-BHC	µg/L	0.2	Org-022/025	<0.2	11	<0.2	<0.2	0	[NT]	[NT]
Heptachlor	µg/L	0.2	Org-022/025	<0.2	11	<0.2	<0.2	0	80	[NT]
delta-BHC	µg/L	0.2	Org-022/025	<0.2	11	<0.2	<0.2	0	[NT]	[NT]
Aldrin	µg/L	0.2	Org-022/025	<0.2	11	<0.2	<0.2	0	79	[NT]
Heptachlor Epoxide	µg/L	0.2	Org-022/025	<0.2	11	<0.2	<0.2	0	84	[NT]
gamma-Chlordane	µg/L	0.2	Org-022/025	<0.2	11	<0.2	<0.2	0	[NT]	[NT]
alpha-Chlordane	µg/L	0.2	Org-022/025	<0.2	11	<0.2	<0.2	0	[NT]	[NT]
Endosulfan I	µg/L	0.2	Org-022/025	<0.2	11	<0.2	<0.2	0	[NT]	[NT]
pp-DDE	µg/L	0.2	Org-022/025	<0.2	11	<0.2	<0.2	0	78	[NT]
Dieldrin	µg/L	0.2	Org-022/025	<0.2	11	<0.2	<0.2	0	84	[NT]
Endrin	µg/L	0.2	Org-022/025	<0.2	11	<0.2	<0.2	0	85	[NT]
Endosulfan II	µg/L	0.2	Org-022/025	<0.2	11	<0.2	<0.2	0	[NT]	[NT]
pp-DDD	µg/L	0.2	Org-022/025	<0.2	11	<0.2	<0.2	0	76	[NT]
Endrin Aldehyde	µg/L	0.2	Org-022/025	<0.2	11	<0.2	<0.2	0	[NT]	[NT]
pp-DDT	µg/L	0.2	Org-022/025	<0.2	11	<0.2	<0.2	0	[NT]	[NT]
Endosulfan Sulphate	µg/L	0.2	Org-022/025	<0.2	11	<0.2	<0.2	0	83	[NT]
Methoxychlor	µg/L	0.2	Org-022/025	<0.2	11	<0.2	<0.2	0	[NT]	[NT]
Mirex	ug/L	0.2	Org-022/025	<0.2	11	<0.2	<0.2	0	[NT]	[NT]
Surrogate 4-Chloro-3-NBTF	%		Org-022/025	80	11	85	77	10	97	[NT]

Client Reference: AU124119

QUALITY CONTROL: HM in water - total						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W3	[NT]
Date prepared	-			12/08/2024	[NT]	[NT]	[NT]	[NT]	12/08/2024	[NT]
Date analysed	-			12/08/2024	[NT]	[NT]	[NT]	[NT]	12/08/2024	[NT]
Arsenic-Total	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	93	[NT]
Cadmium-Total	µg/L	0.1	Metals-022	<0.1	[NT]	[NT]	[NT]	[NT]	97	[NT]
Chromium-Total	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	101	[NT]
Copper-Total	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	100	[NT]
Lead-Total	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	97	[NT]
Mercury-Total	µg/L	0.05	Metals-021	<0.05	[NT]	[NT]	[NT]	[NT]	118	[NT]
Nickel-Total	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	100	[NT]
Zinc-Total	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	92	[NT]

Client Reference: AU124119

QUALITY CONTROL: Miscellaneous Inorganics						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			09/08/2024	[NT]	[NT]	[NT]	[NT]	09/08/2024	[NT]
Date analysed	-			09/08/2024	[NT]	[NT]	[NT]	[NT]	09/08/2024	[NT]
Ammonia as N in water	mg/L	0.005	Inorg-057	<0.005	[NT]	[NT]	[NT]	[NT]	86	[NT]
Phosphate as P in water	mg/L	0.005	Inorg-060	<0.005	[NT]	[NT]	[NT]	[NT]	105	[NT]
Nitrate as N in water	mg/L	0.005	Inorg-055	<0.005	[NT]	[NT]	[NT]	[NT]	99	[NT]
Nitrite as N in water	mg/L	0.005	Inorg-055	<0.005	[NT]	[NT]	[NT]	[NT]	103	[NT]

Client Reference: AU124119

Result Definitions	
NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Client Reference: AU124119

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

The recommended maximums for analytes in urine are taken from “2018 TLVs and BEIs”, as published by ACGIH (where available). Limit provided for Nickel is a precautionary guideline as per Position Paper prepared by AIOH Exposure Standards Committee, 2016.

Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Where matrix spike recoveries fall below the lower limit of the acceptance criteria (e.g. for non-labile or standard Organics <60%), positive result(s) in the parent sample will subsequently have a higher than typical estimated uncertainty (MU estimates supplied on request) and in these circumstances the sample result is likely biased significantly low.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

Client Reference: AU124119

Report Comments

TRH Water(C10-C40) NEPM - The RPD for duplicate results is accepted due to the non homogenous nature of sample 358770-10.

Asbestos-ID in soil: NEPM
This report is consistent with the reporting recommendations in the National Environment Protection (Assessment of Site Contamination) Measure, Schedule B1, May 2013. This is reported outside our scope of NATA accreditation.

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DATA QUALITY ASSESSMENT SUMMARY

Report Details	
Envirolab Report Reference	**358770**
Client ID	Geosyntec
Project Reference	AU124119
Date Issued	16/08/2024

QC DATA

All laboratory QC data was within the Envirolab Group's specifications except:

QC Specification Exceptions

QC Type	Reference	Analysis	Comments
Precision (as %RPD)	358770-10	TRH >C_{16} - C_{34}	106% RPD fails internal acceptance criteria
Precision (as %RPD)	358770-10	TRH C_{29} - C_{36}	124% RPD fails internal acceptance criteria

See Report 358770-[R00] for QA/QC details

HOLDING TIME COMPLIANCE EVALUATION

All preservation / holding times (based on AS/ASPHA/ISO/NEPM/USEPA reference documents and standards) are compliant.

Certain analyses have had their recommended technical holding times elongated by filtering and/or freezing on receipt at the laboratory (e.g. BOD, chlorophyll/Pheophytin, nutrients and acid sulphate soil tests).

COMPLIANCE TO QC FREQUENCY (NEPM)

Internal laboratory QC rate complies with NEPM requirements (LCS/MB/MS 1 in 20, Duplicates 1 in 10 samples). Note, samples are batched together with other sample consignments in order to assign QC sample frequency.

QC Evaluation	
Duplicate(s) was performed as per NEPM frequency	✓
Laboratory Control Sample(s) were analysed with the samples received	✓
A Method Blank was performed with the samples received	✓
Matrix spike(s) was performed as per NEPM frequency (Not Applicable for Air samples)	✓

Refer to Certificate of Analysis for all Quality Control data.

Appendix H Results Summary Tables

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Table 1: Soil and Sediment Results Summary Table

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		Asbestos					BTEX							Halogenated Benzenes	Metals							
		Asbestos (<2mm AF/FA)	Asbestos (ACM >7mm) Estimation	Asbestos fibres	Total Asbestos		Benzene	Ethylbenzene	Naphthalene (VOC)	Toluene	Xylene (m & p)	Xylene (o)	Xylene Total	Hexachlorobenzene	Arsenic	Cadmium	Chromium (III+VI)	Copper	Lead	Mercury	Nickel	Zinc
		g	%w/w	%w/w	Detect	g/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL							0.2	1	1	0.5	2	1	1	0.1	4	0.4	1	1	1	0.1	1	1
ANZG Toxicant Default Guideline Values for Sediment Quality - DGV															20	1.5	80	65	50	0.15	21	200
NEPM 2013 Table 1A(1) HILs Res A Soil														10	100	20		6,000	300	40	400	7,400
NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Clay							0.7 | 1 | 2 | 3			480			110 | 310								
NEPM 2013 Table 1B(5) Site Specific EIL - Urban Res & Public Open Space									170						100		460	75	1,100		170	200
NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse Soil							50	70		85			105									
NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Coarse Soil																						
Field ID	**Date**																					
BH101_0-0.1	**09 Aug 2024**	0	<0.001	<0.01	0	<0.1	<0.2	<1	<1	<0.5	<2	<1	<1	<0.1	<4	<0.4	3	2	4	<0.1	<1	7
BH102_0.1-0.2	**09 Aug 2024**	0	<0.001	<0.01	0	<0.1	<0.2	<1	<1	<0.5	<2	<1	<1	<0.1	<4	<0.4	7	2	5	<0.1	2	5
BH103_0.1-0.2	**09 Aug 2024**	0	<0.001	<0.01	0	<0.1	<0.2	<1	<1	<0.5	<2	<1	<1	<0.1	<4	<0.4	5	2	5	<0.1	1	3
BH104_0.2-0.3	**09 Aug 2024**	0	<0.001	<0.01	0	<0.1	<0.2	<1	<1	<0.5	<2	<1	<1	<0.1	<4	<0.4	7	1	6	<0.1	1	4
BH105_0-0.1	**09 Aug 2024**	0	<0.001	<0.01	0	<0.1	<0.2	<1	<1	<0.5	<2	<1	<1	<0.1	<4	<0.4	5	3	6	<0.1	2	6
BH106_0-0.1	**09 Aug 2024**	0	<0.001	<0.01	0	<0.1	<0.2	<1	<1	<0.5	<2	<1	<1	<0.1	<4	<0.4	19	2	6	<0.1	2	5
SED1	**09 Aug 2024**	-	-	-	-	-	<0.2	<1	<1	<0.5	<2	<1	<1	<0.1	<4	<0.4	24	9	9	<0.1	9	27
SED2	**09 Aug 2024**	-	-	-	-	-	<0.2	<1	<1	<0.5	<2	<1	<1	<0.1	<4	<0.4	30	10	9	<0.1	10	22
Statistics																						
Number of Results		**6**	**6**	**6**	**6**	**6**	**8**	**8**	**8**	**8**	**8**	**8**	**8**	**8**	**8**	**8**	**8**	**8**	**8**	**8**	**8**	**8**
Number of Detects		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**8**	**8**	**8**	**0**	**7**	**8**
Minimum Concentration		**0**	**<0.001**	**<0.01**	**0**	**<0.1**	**<0.2**	**<1**	**<1**	**<0.5**	**<2**	**<1**	**<1**	**<0.1**	**<4**	**<0.4**	**3**	**1**	**4**	**<0.1**	**1**	**3**
Maximum Concentration		**0**	**<0.001**	**<0.01**	**0**	**<0.1**	**<0.2**	**<1**	**<1**	**<0.5**	**<2**	**<1**	**<1**	**<0.1**	**<4**	**<0.4**	**30**	**10**	**9**	**<0.1**	**10**	**27**

Environmental Standards

ANZG, ANZG Toxicant Default Guideline Values for Sediment Quality - DGV
ANZG, ANZG Toxicant Default Guideline Values for Sediment Quality - GV - High
2013, NEPM 2013 Table 1A(1) HILs Res A Soil
2013, NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Clay
2013, NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse Soil
NEPM, NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Coarse Soil

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Table 1: Soil and Sediment Results Summary Table

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		Organochlorine Pesticides																				
		4,4-DDE	a-BHC	Aldrin	Aldrin + Dieldrin	b-BHC	Chlordane (cis)	Chlordane (trans)	d-BHC	DDD	DDT	DDT+DDE+DDD	Dieldrin	Endosulfan I	Endosulfan II	Endosulfan sulphate	Endrin	Endrin aldehyde	g-BHC (Lindane)	Heptachlor	Heptachlor epoxide	Methoxychlor
		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
ANZG Toxicant Default Guideline Values for Sediment Quality - DGV													0.0028				0.0027		0.0009			
NEPM 2013 Table 1A(1) HILs Res A Soil					6							240					10			6		300
NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Clay																						
NEPM 2013 Table 1B(5) Site Specific EIL - Urban Res & Public Open Space											180											
NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse Soil																						
NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Coarse Soil																						
Field ID	**Date**																					
BH101_0-0.1	**09 Aug 2024**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BH102_0.1-0.2	**09 Aug 2024**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BH103_0.1-0.2	**09 Aug 2024**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BH104_0.2-0.3	**09 Aug 2024**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BH105_0-0.1	**09 Aug 2024**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BH106_0-0.1	**09 Aug 2024**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
SED1	**09 Aug 2024**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
SED2	**09 Aug 2024**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Statistics																						
Number of Results		**8**	**8**	**8**	**8**	**8**	**8**	**8**	**8**	**8**	**8**	**8**	**8**	**8**	**8**	**8**	**8**	**8**	**8**	**8**	**8**	**8**
Number of Detects		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Minimum Concentration		**<0.1**	**<0.1**	**<0.1**	**<0.1**	**<0.1**	**<0.1**	**<0.1**	**<0.1**	**<0.1**	**<0.1**	**<0.1**	**<0.1**	**<0.1**	**<0.1**	**<0.1**	**<0.1**	**<0.1**	**<0.1**	**<0.1**	**<0.1**	**<0.1**
Maximum Concentration		**<0.1**	**<0.1**	**<0.1**	**<0.1**	**<0.1**	**<0.1**	**<0.1**	**<0.1**	**<0.1**	**<0.1**	**<0.1**	**<0.1**	**<0.1**	**<0.1**	**<0.1**	**<0.1**	**<0.1**	**<0.1**	**<0.1**	**<0.1**	**<0.1**

Environmental Standards

ANZG, ANZG Toxicant Default Guideline Values for Sediment Quality - DGV
ANZG, ANZG Toxicant Default Guideline Values for Sediment Quality - GV - High
2013, NEPM 2013 Table 1A(1) HILs Res A Soil
2013, NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Clay
2013, NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse Soil
NEPM, NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Coarse Soil

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Table 1: Soil and Sediment Results Summary Table

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		PAH																				Pesticides
		Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a) pyrene	Benzo(a)pyrene (mid point)	Benzo(a)pyrene TEQ (lower bound)	Benzo(a)pyrene TEQ (upper bound)	Benzo(b+j+k)fluoranthene	Benzo(g,h,i)perylene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene	PAHs (Sum of positive)	Phenanthrene	Pyrene	Mirex
		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL		0.1	0.1	0.1	0.1	0.05	0.5	0.5	0.5	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.05	0.1	0.1	0.1
ANZG Toxicant Default Guideline Values for Sediment Quality - DGV																					
NEPM 2013 Table 1A(1) HILs Res A Soil							3	3	3												10
NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Clay																	5				
NEPM 2013 Table 1B(5) Site Specific EIL - Urban Res & Public Open Space																	170				
NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse Soil						0.7															
NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Coarse Soil																					
Field ID	**Date**																				
BH101_0-0.1	**09 Aug 2024**	<0.1	<0.1	<0.1	<0.1	<0.05	<0.5	<0.5	<0.5	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.05	<0.1	<0.1	<0.1
BH102_0.1-0.2	**09 Aug 2024**	<0.1	<0.1	<0.1	<0.1	<0.05	<0.5	<0.5	<0.5	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.05	<0.1	<0.1	<0.1
BH103_0.1-0.2	**09 Aug 2024**	<0.1	<0.1	<0.1	<0.1	<0.05	<0.5	<0.5	<0.5	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.05	<0.1	<0.1	<0.1
BH104_0.2-0.3	**09 Aug 2024**	<0.1	<0.1	<0.1	<0.1	<0.05	<0.5	<0.5	<0.5	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.05	<0.1	<0.1	<0.1
BH105_0-0.1	**09 Aug 2024**	<0.1	<0.1	<0.1	<0.1	<0.05	<0.5	<0.5	<0.5	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.05	<0.1	<0.1	<0.1
BH106_0-0.1	**09 Aug 2024**	<0.1	<0.1	<0.1	<0.1	<0.05	<0.5	<0.5	<0.5	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.05	<0.1	<0.1	<0.1
SED1	**09 Aug 2024**	<0.1	<0.1	<0.1	<0.1	<0.05	<0.5	<0.5	<0.5	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.05	<0.1	<0.1	<0.1
SED2	**09 Aug 2024**	<0.1	<0.1	<0.1	<0.1	<0.05	<0.5	<0.5	<0.5	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.05	<0.1	<0.1	<0.1
Statistics																					
Number of Results		**8**	**8**	**8**	**8**	**8**	**8**	**8**	**8**	**8**	**8**	**8**	**8**	**8**	**8**	**8**	**8**	**8**	**8**	**8**	**8**
Number of Detects		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Minimum Concentration		**<0.1**	**<0.1**	**<0.1**	**<0.1**	**<0.05**	**<0.5**	**<0.5**	**<0.5**	**<0.2**	**<0.1**	**<0.1**	**<0.1**	**<0.1**	**<0.1**	**<0.1**	**<0.1**	**<0.05**	**<0.1**	**<0.1**	**<0.1**
Maximum Concentration		**<0.1**	**<0.1**	**<0.1**	**<0.1**	**<0.05**	**<0.5**	**<0.5**	**<0.5**	**<0.2**	**<0.1**	**<0.1**	**<0.1**	**<0.1**	**<0.1**	**<0.1**	**<0.1**	**<0.05**	**<0.1**	**<0.1**	**<0.1**

Environmental Standards

ANZG, ANZG Toxicant Default Guideline Values for Sediment Quality - DGV
ANZG, ANZG Toxicant Default Guideline Values for Sediment Quality - GV - High
2013, NEPM 2013 Table 1A(1) HILs Res A Soil
2013, NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Clay
2013, NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse Soil
NEPM, NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Coarse Soil

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Table 1: Soil and Sediment Results Summary Table

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		PHCs												
		C10-C14	C10-C36 (Sum of total)	C10-C40 (Sum of total)	C15-C28	C29-C36	C34-C40	C6-C9	F1	F1 minus BTEX	F2	F2 minus Naphthalene	F3
		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL		50	50	50	100	100	100	25	25	25	50	50	100
ANZG Toxicant Default Guideline Values for Sediment Quality - DGV													
NEPM 2013 Table 1A(1) HILs Res A Soil													
NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Clay										50 | 90 | 150 | 290		280	
NEPM 2013 Table 1B(5) Site Specific EIL - Urban Res & Public Open Space													
NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse Soil							2,800			180	120	120	300
NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Coarse Soil							10,000		700		1,000		2,500
Field ID	**Date**												
BH101_0-0.1	**09 Aug 2024**	<50	<50	<50	<100	<100	<100	<25	<25	<25	<50	<50	<100
BH102_0.1-0.2	**09 Aug 2024**	<50	<50	<50	<100	<100	<100	<25	<25	<25	<50	<50	<100
BH103_0.1-0.2	**09 Aug 2024**	<50	<50	<50	<100	<100	<100	<25	<25	<25	<50	<50	<100
BH104_0.2-0.3	**09 Aug 2024**	<50	<50	<50	<100	<100	<100	<25	<25	<25	<50	<50	<100
BH105_0-0.1	**09 Aug 2024**	<50	<50	<50	<100	<100	<100	<25	<25	<25	<50	<50	<100
BH106_0-0.1	**09 Aug 2024**	<50	<50	<50	<100	<100	<100	<25	<25	<25	<50	<50	<100
SED1	**09 Aug 2024**	<50	120	<50	<100	120	<100	<25	<25	<25	<50	<50	<100
SED2	**09 Aug 2024**	<50	140	140	<100	140	<100	<25	<25	<25	<50	<50	140
Statistics													
Number of Results		**8**	**8**	**8**	**8**	**8**	**8**	**8**	**8**	**8**	**8**	**8**	**8**
Number of Detects		**0**	**2**	**1**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**1**
Minimum Concentration		**<50**	**<50**	**<50**	**<100**	**<100**	**<100**	**<25**	**<25**	**<25**	**<50**	**<50**	**<100**
Maximum Concentration		**<50**	**140**	**140**	**<100**	**140**	**<100**	**<25**	**<25**	**<25**	**<50**	**<50**	**140**

Environmental Standards

ANZG, ANZG Toxicant Default Guideline Values for Sediment Quality - DGV
ANZG, ANZG Toxicant Default Guideline Values for Sediment Quality - GV - High
2013, NEPM 2013 Table 1A(1) HILs Res A Soil
2013, NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Clay
2013, NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse Soil
NEPM, NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Coarse Soil

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Table 2- Surface Water Results Summary Table **AU124119**

		Inorganics				BTEX						Halogenated Benzenes	Metals							
		Ammonia as N (filtered)	Nitrate (as N) (filtered)	Nitrite (as N) (filtered)	Reactive Phosphorus as P (Orthophosphate as P) (filtered)	Benzene	Ethylbenzene	Naphthalene (VOC)	Toluene	Xylene (m & p)	Xylene (o)	Hexachlorobenzene	Arsenic	Cadmium	Chromium (III+VI)	Copper	Lead	Mercury	Nickel	Zinc
		mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
EQL		0.005	0.005	0.005	0.005	1	1	0.001	1	2	1	0.2	0.001	0.0001	0.001	0.001	0.001	0.00005	0.001	0.001
ANZG Freshwater Toxicant DGVs LOSP 95% (July 2023)		0.9				950	80		180		350	0.1		0.0002		0.0014	0.0034	0.0006	0.011	0.008
Field ID	**Date**																			
SW1E	**09 Aug 2024**	<0.005	2.3	0.042	0.005	<1	<1	<0.001	<1	<2	<1	<0.2	0.018	0.0003	0.084	0.051	0.049	<0.00005	0.043	0.16
SW2W	**09 Aug 2024**	<0.005	4.4	0.008	<0.005	<1	<1	<0.001	<1	<2	<1	<0.2	<0.001	<0.0001	<0.001	<0.001	<0.001	<0.00005	<0.001	0.001
Statistics																				
Number of Results		**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**
Number of Detects		**0**	**2**	**2**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**1**	**1**	**1**	**0**	**1**	**2**
Minimum Concentration		**<0.005**	**2.3**	**0.008**	**0.005**	**<1**	**<1**	**<0.001**	**<1**	**<2**	**<1**	**<0.2**	**<0.001**	**<0.0001**	**<0.001**	**<0.001**	**<0.001**	**<0.00005**	**<0.001**	**0.001**
Maximum Concentration		**<0.005**	**4.4**	**0.042**	**0.005**	**<1**	**<1**	**<0.001**	**<1**	**<2**	**<1**	**<0.2**	**0.018**	**0.0003**	**0.084**	**0.051**	**0.049**	**<0.00005**	**0.043**	**0.16**

Environmental Standards

ANZG, July 2023, ANZG Freshwater Toxicant DGVs LOSP 95% (July 2023)

Geosyntec consultants

Table 2- Surface Water Results Summary Table **AU124119**

		Organochlorine Pesticides																		
		4,4-DDE	a-BHC	Aldrin	b-BHC	Chlordane (cis)	Chlordane (trans)	d-BHC	DDD	DDT	Dieldrin	Endosulfan I	Endosulfan II	Endosulfan sulphate	Endrin	Endrin aldehyde	g-BHC (Lindane)	Heptachlor	Heptachlor epoxide	Methoxychlor
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL		0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
ANZG Freshwater Toxicant DGVs LOSP 95% (July 2023)										0.01					0.02		0.2	0.09		
Field ID	**Date**																			
SW1E	09 Aug 2024	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
SW2W	09 Aug 2024	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Statistics																				
Number of Results		2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Number of Detects		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Concentration		<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Maximum Concentration		<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2

Environmental Standards

ANZG, July 2023, ANZG Freshwater Toxicant DGVs LOSP 95% (July 2023)

Geosyntec consultants

Table 2- Surface Water Results Summary Table **AU124119**

		PAH																
		Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a) pyrene	Benzo(a)pyrene WHOTEQ	Benzo(b+j+k)fluoranthene	Benzo(g,h,i)perylene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene	PAHs (Sum of positives)	Phenanthrene	Pyrene
		µg/L	µg/L	µg/L	µg/L	µg/L	ug/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL		0.1	0.1	0.1	0.1	0.1	0.5	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
ANZG Freshwater Toxicant DGVs LOSP 95% (July 2023)				0.4		0.2						1.4			16		2	
Field ID	**Date**																	
SW1E	**09 Aug 2024**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
SW2W	**09 Aug 2024**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Statistics																		
Number of Results		**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**
Number of Detects		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Minimum Concentration		**<0.1**	**<0.1**	**<0.1**	**<0.1**	**<0.1**	**<0.5**	**<0.2**	**<0.1**	**<0.1**	**<0.1**	**<0.1**	**<0.1**	**<0.1**	**<0.1**	**<0.1**	**<0.1**	**<0.1**
Maximum Concentration		**<0.1**	**<0.1**	**<0.1**	**<0.1**	**<0.1**	**<0.5**	**<0.2**	**<0.1**	**<0.1**	**<0.1**	**<0.1**	**<0.1**	**<0.1**	**<0.1**	**<0.1**	**<0.1**	**<0.1**

Environmental Standards

ANZG, July 2023, ANZG Freshwater Toxicant DGVs LOSP 95% (July 2023)

Geosyntec consultants

Table 2- Surface Water Results Summary Table **AU124119**

		Pesticides	PHCs											
		Mirex	C10-C14	C10-C36 (Sum of total)	C10-C40 (Sum of total)	C15-C28	C29-C36	C34-C40	C6-C9	F1	F1 minus BTEX	F2	F2 minus Naphthalene	F3
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL		0.2	50	50	50	100	100	100	10	10	10	50	50	100
ANZG Freshwater Toxicant DGVs LOSP 95% (July 2023)														
Field ID	**Date**													
SW1E	**09 Aug 2024**	<0.2	180	1,100	1,100	380	550	160	<10	<10	<10	190	190	780
SW2W	**09 Aug 2024**	<0.2	<50	<50	<50	<100	<100	<100	<10	<10	<10	<50	<50	<100
Statistics														
Number of Results		**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**
Number of Detects		**0**	**1**	**1**	**1**	**1**	**1**	**1**	**0**	**0**	**0**	**1**	**1**	**1**
Minimum Concentration		**<0.2**	**<50**	**<50**	**<50**	**<100**	**<100**	**<100**	**<10**	**<10**	**<10**	**<50**	**<50**	**<100**
Maximum Concentration		**<0.2**	**180**	**1,100**	**1,100**	**380**	**550**	**160**	**<10**	**<10**	**<10**	**190**	**190**	**780**

Environmental Standards

ANZG, July 2023, ANZG Freshwater Toxicant DGVs LOSP 95% (July 2023)

Appendix I Calibration Certificates

6/8/24

Multi Parameter Water Meter

airmet
Air-Met Scientific Pty Ltd
1300 137 067

Instrument YSI Quatro Pro Plus
Serial No. 10H100319

Item	Test	Pass	Comments
Battery	Charge Condition	✓	
	Fuses	✓	
	Capacity	✓	
Switch/keypad	Operation	✓	
Display	Intensity	✓	
	Operation (segments)	✓	
Grill Filter	Condition	✓	
	Seal	✓	
PCB	Condition	✓	
Connectors	Condition	✓	
Sensor	1. pH	✓	
	2. mV	✓	
	3. EC	✓	
	4. D.O	✓	
	5. Temp	✓	
Alarms	Beeper		
	Settings		
Software	Version		
Data logger	Operation		
Download	Operation		
Other tests:			

Certificate of Calibration

This is to certify that the above instrument has been calibrated to the following specifications:

Sensor	Serial no	Standard Solutions	Certified	Solution Bottle Number	Instrument Reading
1. pH 7.00		7.00		419529	6.99
2. pH 4.00		4.00		414104	3.97
3. ORP (mV)		250.12		420151/420152	249.9
4. EC (us/cm)		2760		424499	2760
5. D.O (%)		0.00%		407802	0.4%
6. Temp ©		15.4		MultiTherm	14.9

Calibrated by: Christopher Nicdao

Calibration date: 6/08/2024

Next calibration due: 5/09/2024

26/7/24

Multi Parameter Water Meter

airmet
Air-Met Scientific Pty Ltd
1300 137 067

Instrument YSI Quatro Pro Plus
Serial No. 10H100319

Item	Test	Pass	Comments
Battery	Charge Condition	✓	
	Fuses	✓	
	Capacity	✓	
Switch/keypad	Operation	✓	
Display	Intensity	✓	
	Operation (segments)	✓	
Grill Filter	Condition	✓	
	Seal	✓	
PCB	Condition	✓	
Connectors	Condition	✓	
Sensor	1. pH	✓	
	2. mV	✓	
	3. EC	✓	
	4. D.O	✓	
	5. Temp	✓	
Alarms	Beeper		
	Settings		
Software	Version		
Data logger	Operation		
Download	Operation		
Other tests:			

Certificate of Calibration

This is to certify that the above instrument has been calibrated to the following specifications:

Sensor	Serial no	Standard Solutions	Certified	Solution Bottle Number	Instrument Reading
1. pH 7.00		7.00		419529	7.06
2. pH 4.00		4.00		414104	3.88
3. ORP (mV)		243.08		420151/420152	243.2
4. EC (us/cm)		2760		424499	2755
5. D.O (%)		0.00%		407802	0.1%
6. Temp ©		18.6		MultiTherm	18.1

Calibrated by: Christopher Nicdao

Calibration date: 26/07/2024

Next calibration due: 25/08/2024

PID Calibration Certificate

Instrument PhoCheck Tiger
Serial No. T-113854

airmet

Air-Met Scientific Pty Ltd
1300 137 067

Item	Test	Pass	Comments			
Battery	Charge Condition	✓				
	Fuses	✓				
	Capacity	✓				
	Recharge OK?	✓				
Switch/keypad	Operation	✓				
Display	Intensity	✓				
	Operation (segments)	✓				
Grill Filter	Condition	✓				
	Seal	✓				
Pump	Operation	✓				
	Filter	✓				
	Flow	✓				
	Valves, Diaphragm	✓				
PCB	Condition	✓				
Connectors	Condition	✓				
Sensor	PID	✓	10.6 ev			
Alarms	Beeper	✓	Low	High	TWA	STEL
	Settings	✓	50ppm	100ppm		
Software	Version	✓				
Data logger	Operation	✓				
Download	Operation	✓				
Other tests:						

Certificate of Calibration

This is to certify that the above instrument has been calibrated to the following specifications:

Diffusion mode Aspirated mode

Sensor	Serial no	Calibration gas and concentration	Certified	Gas bottle No		Instrument Reading
PID Lamp		97 ppm Isobutylene	NATA	SY532		97.0 ppm Isobutylene

Calibrated by: Alex Buist

Calibration date: 5/08/2024

Next calibration due: 4/09/2024

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LAND USE CONFLICT RISK ASSESSMENT

PLANNING PROPOSAL

Stuart and Catherine Duke
GUNNING HEIGHTS ESTATE
18 Boureong Drive, Gunning
Lot 4 DP 1198749

November 2024 **Reference No.: 2022**

Prepared by:
Laterals Planning
1st Floor, 213 Auburn Street
(PO Box 1326) Goulburn NSW 2580
Tel: (02) 4821 0973 Fax: (02) 4822 0777 Email: robert@laterals.com.au

CONTENTS

1 INTRODUCTION

This report relates to a planning proposal by Stuart and Catherine Duke to the Upper Lachlan Shire Council to rezone and amend the lot size for certain land being:

- Lot 4 DP 1198749 from RU4 Primary Production Small Lots zone to RU5 Village zone and reduce the minimum lot size from 10ha to 1,000m^2 to enable the development of dwelling houses on lots to be created under the Upper Lachlan Local Environmental Plan 2010 (LEP 2010).

This assessment is based upon the Land Use Conflict Risk Assessment Guide (LUCRA) published by the Department of Primary Industries (October 2011) and seeks to achieve –

- A description of the nature of the proposed land use change and proposed development.
- A description and record of the major activities separation strategies associated with the land use change and their frequency including periodic and seasonal activities that have the potential to be a source of a complaint or conflict
- Appraisal of the topography, climate and natural features of the site and broader locality
- A site history appraisal of the site
- An inspection of the site
- A description and record of the main activities of the adjacent properties and their frequency, and
- A comparison and contrast of the proposed and adjoining/surrounding land uses and activities for incompatibility and conflict issues.

The resultant planning proposal will result in the following expected development:

- RU5 (Village Zone), RE1 (Public Recreation Zone), C3 (Environmental Management Zone and MU1 (Mixed Use Zone) comprising a total of 51 residential lots.

This assessment is informed by the following documents:

- Planning Proposal prepared by Laterals Planning dated January 2024.
- Land Zone Map prepared by Laterals Planning dated 24 September 2024.
- Lot Size Map prepared by Laterals Planning dated 24 September 2024.
- Concept Subdivision Plan prepared by Laterals Planning dated 24 September 2024.
- Concept Subdivision Topographic Plan prepared by Laterals Planning dated 24 September 2024.
- Concept Subdivision Aerial Photograph prepared by Laterals Planning dated 24 September 2024.

1.1 HISTORY OF SITE

The subject site, Lot 4 DP 1198749, 18 Boureong Drive, Gunning, NSW, comprises an area of 10.97ha and occurs in a rural/ village landscape to the northeast of Gunning in the south of the Upper Lachlan Shire Local Government Area. The site is 39km to the east of Yass and 49km to the west of Goulburn in the Southern Tablelands. The land comprises part of a rural small holdings development dating from about 2014 and the general area is used for residential purposes and very small scale rural uses. The subject area is gently sloping and is approx. 250m wide and 350m deep with topography being a sloping landform with a grade of approx. 10%. The land is not capable of sustaining high impact land uses and contains a Strahler 1st order watercourse adjacent to the southern boundary of the land. This intermittent watercourse drains to the west to Meadow Creek. The subject land is also located in the general vicinity of the Gunning Sewage Treatment Plant (STP) and the southwest corner of the land is located approx. 160m from the northeast boundary of the STP site. An Odour Impact Assessment has been undertaken by SLR Consulting Australia Pty Ltd and a copy of the report dated 7 November 2024 concludes that the GSTP odours pose no constraint on the proposed development of the site.

1.2 CONSULTATION WITH COUNCIL

The planning proposal has been publicly advertised and this LUCRA comprises part of the applicant's response to Council regarding submissions received from the public and various authorities. It is also noted that:

- Council has not requested such an assessment
- The Council does not appear to have any policy concerning the completion of a LUCRA assessment.
- There is no copy of any advice the Council might have received from the Department of Primary Industry advising that a LUCRA assessment should be conducted although the NSW EPA have recommended to Council that possible land use conflict be considered.

Notwithstanding the above a LUCRA assessment is conducted for completeness and as a review of potential conflicts.

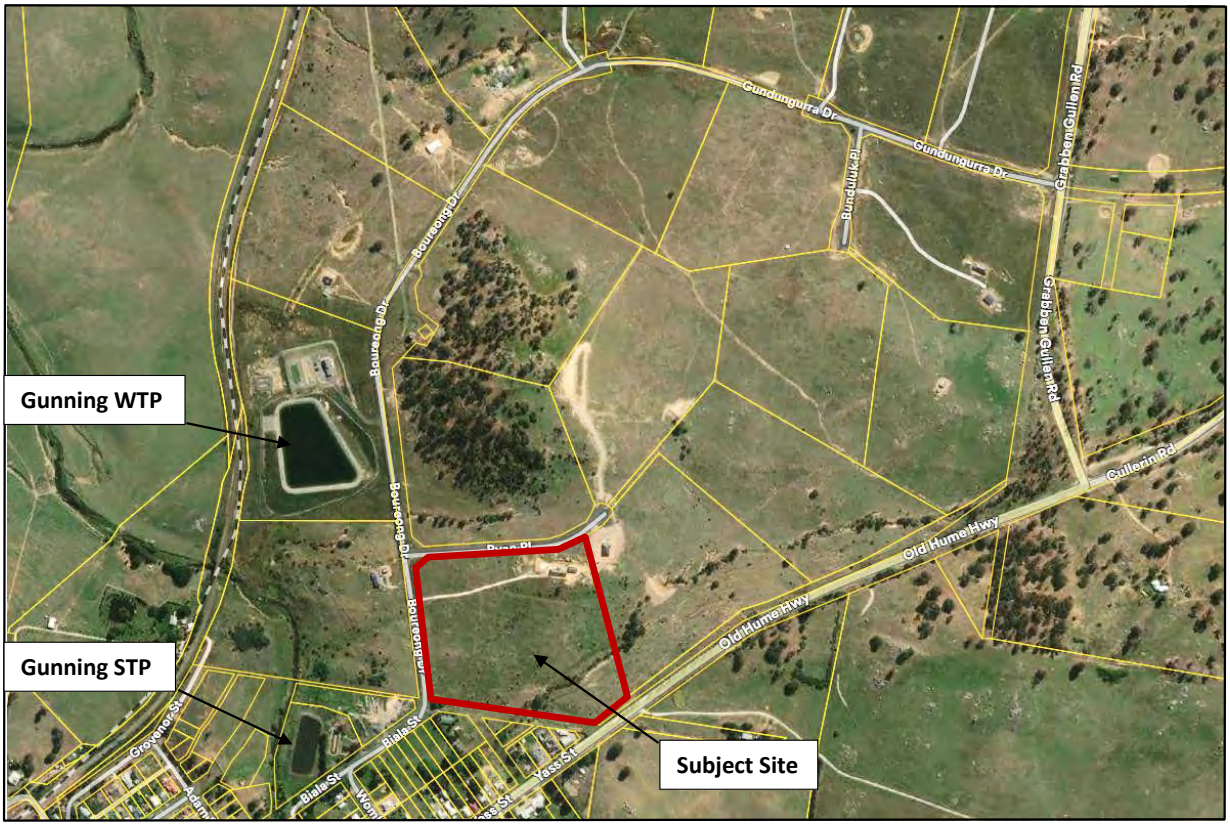
2 SITE AND LOCALITY ANALYSIS

2.1 SITE DESCRIPTION, LOCATION & CONTEXT

The subject site, Lot 4 DP 1198749, 18 Boureong Drive, Gunning, NSW, comprises an area of 10.97ha and occurs in a rural/ village landscape to the northeast of Gunning in the south of the Upper Lachlan Shire Local Government Area. The site is 39km to the east of Yass and 49km to the west of Goulburn in the Southern Tablelands. The land comprises part of a rural small holdings development dating from about 2014 and the general area is used for residential purposes and very small scale rural uses. The subject area is gently sloping and is approx. 250m wide and 350m deep with topography being a sloping landform with a grade of approx. 10%. The land is not capable of sustaining high impact land uses and contains a Strahler 1st order watercourse adjacent to the southern boundary of the land. This intermittent watercourse drains to the west to Meadow Creek. The site is serviced with reticulated water and sewerage and electricity and telephone. Stormwater drains to the watercourse adjacent to the southern boundary of the land which drains to the west to Meadow Creek. Access to the site is from Boureong Drive and there have been no general improvements on the site other than a dwelling located in the northeast corner of the land.

2.3 SURROUNDING DEVELOPMENT

The subject land is adjacent to the existing village of Gunning and the area is shown in the aerial photograph below.



Aerial Photograph
(Source: Nearmap Website)

The aerial photograph above indicates that the surrounding land contains:

- North – Ryan Place and rural residential development.
- South – residential development and the village of Gunning.
- East – rural residential development.
- West – rural residential development.

3 LAND USE CONFLICT RISK ASSESSMENT

3.1 POTENTIAL ACTIVITIES, ISSUES and RISK

This assessment primarily relates to issues arising from potential conflict between rural practices/ activities and the proposed residential subdivision. Potential risks or impacts that may give rise to possible land use conflicts have been considered and evaluated in the context of the site, surroundings and land use policy setting to establish if any minimisation or management measures may be required. In this instance, the main potential for conflict to arise would be through perceived or actual impacts from adjoining grazing and farming activities on future residential uses/ development.

3.2 RISK EVALUATION and RANKING

A risk assessment matrix is used in LUCRA to rank the potential land use conflicts in terms of significance. The matrix assesses the environmental/ public health and amenity impacts according to the:

- probability of occurrence; and
- severity/ consequence of impact.

The procedure of environmental/ public health and amenity hazard identification and risk control are performed in three stages.

1. Environmental/ public health and amenity hazard identification;
2. Risk assessment and ranking;
3. Risk control development.

Procedure:

1. Prepare LUCRA Hazard Identification and Risk Control table/ form.
2. List all hazards associated with each activity.
3. Assess and rank the risk arising from each hazard before "controls" are applied on the LUCRA form.
4. If required, an unacceptable risk rating is indicated, develop controls that minimise the probability and consequence of each risk using the five level methods.
5. Re-rank each risk with the control in place to ensure that the risk has been reduced to an acceptable level. If the risk ranking is not deemed to be acceptable, consideration should be given to whether the proposed activity should be allowed to proceed or whether additional management is required.

3.3 RISK ASSESSMENT and RANKING

Activities with the potential to cause conflict are assessed and ranked using the risk assessment/ ranking matrix shown in Table 3.1 below. It is necessary to differentiate between an 'environmental hazard' and an 'environmental risk'. 'Hazard' indicates the potential for harm, while 'risk' refers to the probability of that harm occurring. For example, the presence of chemicals stored in a building is a hazard, but while the chemicals are stored appropriately, the risk is negligible. The risk ranking matrix yields a risk ranking from 25 to 1. It covers each combination of five levels of 'probability' (as defined in Table 3.2 below) and five levels of 'severity' or 'consequence', (a number 1 to 5 as defined in Table 3.3 below) to identify the risk ranking of each impact. For example, an activity with a 'probability' of D (unlikely) and a 'consequence' of 3 yields a risk rank of 9. A rank of 25 is the highest magnitude of risk that is a highly likely, very serious event. A rank of 1 represents the lowest magnitude or risk, an almost impossible and very low consequence event. Generally, a risk rating of 1-10 is considered an acceptable risk that does not need intervention; whilst a risk ranking of 11-25 (highlighted red) is considered an unacceptable risk and likely requires management/ mitigation measures to help avoid or reduce potential risk to an acceptable level.

The risk identification process involves the identification of those actions which would potentially cause disruption to other people or activities in the area. In this process the Department of Primary Industry Probability Table and Risk Ranking Matrix are utilised to determine a risk ranking.

Table 3.1 Risk Ranking Matrix

PROBABILITY	A	B	C	D	E
Consequence					
1	25	24	22	19	15
2	23	21	18	14	10
3	20	17	13	9	6
4	16	12	8	5	3
5	11	7	4	2	1

The Probability Table for the identification of a probability or potential or real impact is as follows:

Table 3.2 Probability Table

Level	Descriptor	Description
A	Almost certain	Common or repeating occurrence
B	Likely	Known to occur, or 'it has happened'
C	Possible	Could occur, or 'I've heard of it happening'
D	Unlikely	Could occur in some circumstances, but not likely to occur
E	Rare	Practically impossible

The Measure of Consequence of a potential or realistic impact is as follows:

Table 3.3 Measure of Consequence

Level: 1	**Descriptor: Severe**
Description	• Severe and/or permanent damage to the environment • Irreversible • Severe impact on the community • Neighbours are in prolonged dispute and legal action involved
Example/Implication	• Harm or death to animals, fish, birds or plants • Long term damage to soil or water • Odours so offensive some people are evacuated or leave voluntarily • Many public complaints and serious damage to Council's reputation • Contravenes Protection of the Environment & Operations Act and the conditions of Council's licences and permits. Almost certain prosecution under the POEO Act
Level: 2	**Descriptor: Major**
Description	• Serious and/or long-term impact to the environment • Long-term management implications • Serious impact on the community • Neighbours are in serious dispute
Example/Implication	• Water, soil or air impacted, possibly in the long term • Harm to animals, fish or birds or plants • Public complaints. Neighbour disputes occur. Impacts pass quickly • Contravenes the conditions of Council's licences, permits and the POEO Act • Likely prosecution
Level: 3	**Descriptor: Moderate**
Description	• Moderate and/or medium-term impact to the environment and community • Some ongoing management implications • Neighbour disputes occur
Example/Implication	• Water, soil or air known to be affected, probably in the short term • No serious harm to animals, fish, birds or plants • Public largely unaware and few complaints to Council • May contravene the conditions of Council's Licences and the POEO Act • Unlikely to result in prosecution
Level: 4	**Descriptor: Minor**
Description	• Minor and/or short-term impact to the environment and community • Can be effectively managed as part of normal operations

	• Infrequent disputes between neighbours
Example/Implication	• Theoretically could affect the environment or people but no impacts noticed • No complaints to Council • Does not affect the legal compliance status of Council
Level: 5	**Descriptor: Negligible**
Description	• Very minor impact to the environment and community • Can be effectively managed as part of normal operations • Neighbour disputes unlikely
Example/Implication	• No measurable or identifiable impact on the environment • No measurable impact on the community or impact is generally acceptable

Each proposed activity is recorded on Table 3.5 and an assessment of potential land use conflict level is assigned accordingly. Ranking is given before and after any relevant ameliorating measures are applied to mitigate the given activity impacts. The higher the risk level, the more attention/ management it will likely require in order to reduce the ranking level. Risk rankings are derived from the risk ranking tables above.

Table 3.4 below provides an overview of the site features and conditions that can influence the potential level of conflict. These potential factors can influence the potential level of conflict and therefore inform the subsequent risk assessment. The areas of potential conflict outlined in Table 3.4 are then addressed through the risk/ hazard assessment and management measures/ controls outlined in Table 3.5.

Table 3.4 LUCRA Site Assessment and Influential Factors

Site Feature / Element	Condition / Comments	Potential for Conflict
Site Location: Vehicular Access	The subject site would be accessed off Boureong Drive. This is a local access road servicing the RU4 zoned land and connects from Bialla Street to Grabben Gullen Road. There could be conflicts between the existing traffic and future residents' vehicles as well as construction traffic within the road reserve. Measures to reduce any potential traffic impacts would be addressed through the design, development and traffic assessment component of a future DA including any necessary road upgrades and intersections and speed limit reductions.	Low
Exposure and wind	The Odour Impact Assessment prepared by SLR Consulting dated 7 November 2024 includes the following statement: **4.4 Wind Speed and Direction** Long term wind data (9:00 am and 3:00 pm) for Goulburn Airport are presented as wind roses in **Figure 8**. The wind roses show that winds from west and north-west are predominant in the morning and afternoon periods, with a high frequency of westerly winds also evident in the afternoon. The majority of wind likely to be experienced in the area would be from the west and north-west.	Low to moderate
Run-on and Seepage, Site Drainage and Water pollution	Run-on or seepage from adjoining rural land will be negligible. The subject land and adjacent land generally falls away from a ridge line incorporating Ryan Place towards the un-named watercourse and there are no other defined drainage lines or water courses present on the site. A stormwater assessment will be prepared as part of a future DA to identify measures for the control and treatment of stormwater. Water quantity and quality can be appropriately managed and would not pose unreasonable or unacceptable impacts.	Low
Agricultural Chemical Spray Drift	Broadcast spraying via tractor and is unlikely to occur on the adjoining properties due to the relatively small area of the properties and topography. Spot/ targeted spraying may occur. Given prevailing wind conditions, significant spray drift is not expected.	Low

Odour	With small scale rural activities occurring in the area (e.g. cattle and sheep grazing) there is the potential for activities to impact on adjoining residential uses. Due to the expected low stocking rates, odour from these activities will be minimal. There are no stock holding yards in the vicinity of the proposed development. The Gunning STP located to the southwest of the site has the potential for odour in the area. The STP is located at least 250m from any proposed residential development and the Odour Impact Assessment prepared by SLR Consulting dated 7 November 2024 states the odour emissions from the STP will pose no constraint on the proposed development of the site.	Low
Noise	The likelihood of noise impacts from the existing rural activities is relatively low given there would be intermittent use of tractors and vehicles, general noise of grazing livestock and there is a lack of proximal ancillary farm infrastructure (such as sheds, cattle yards and loading infrastructure). No significant or unreasonable noise is expected.	Low
Dust	The main sources of dust from nearby rural activities could include soil cultivation, tractor use, potential over-stocking (though unlikely), and transport movements. These activities in the local context of the adjoining land are not considered high risk in relation to generating dust. The dominant wind direction would minimise direct exposure to potential dust.	Low
Residential subdivision design	The residential subdivision has been designed to make efficient use of land resources to be zoned for such purposes. The layout will minimise potential impacts and the development will comply with Council policy and DCP requirement. All residential dwellings will be adequately setback from street frontages, side and rear boundaries with all lots being adequately fenced. The development would be engineered and designed to manage traffic and stormwater quality and quantity.	Low

Table 3.5 Hazard Identification, Risk Evaluation, Mitigation / Control and Ranking

Activity	Identified Potential Conflict	Potential Risk Ranking	Mitigating Factors / Control Methods	Residual / Controlled Ranking
Noise (rural activities)	Potential noise from livestock, on the eastern property. Noise produced by gates, machinery and other associated ancillary farm infrastructure. Potential noise associated with pest/ vermin control.	C3 = 13 unacceptable.	No significant noise is expected, however common background farm noise could be intermittently present. The immediately adjoining farm activity is not considered high intensity or concentrated, and there is no immediately nearby ancillary farm infrastructure expected to generate high additional noise. General occasional stock noise could at times be considered a nuisance, though is not considered unreasonable or adverse and can generally be tolerated. Likewise, noise from vehicles and machinery would be intermittent.	C4 = 8 acceptable.
Dust generation	Dust emissions can adversely affect residential amenity and enjoyment. Dry periods, land cultivation/	C4 = 8 acceptable.	Dust generation as a result of agricultural activities on the adjoining property are not anticipated to be of a scale or intensity to result in unacceptable effects on	D4 = 5 acceptable.

	frequent machinery movements, or overstocking (though unlikely) could result in related dust and air quality impacts.		residential premises. General soft landscaping on the residential lots would effectively reduce potential issues and conflict associated with possible dust drift.	
Odour	Livestock activity/ presence and accumulation of manure and the application of herbicides for weed management can cause potential odour which could drift. Although, no significant odour is expected there is some potential. The proximity of the GSTP also has the potential for odour drift.	C3 = 13 unacceptable.	The subdivision design incorporates measures that are appropriate to mitigate any potential impacts from odour from adjoining rural operations given the scale and intensity of activities. This, combined with soft landscaping of the residential lots is sufficient considering the nature and scale of activities at this site. The GSTP will not impact the site as noted in the Odour Impact Assessment.	C4 = 8 acceptable.
Runoff and erosion management during development construction	Potential for sediment laden or contaminated runoff and erosion if not effectively managed during construction.	C3 = 13 unacceptable.	Stormwater runoff would be captured by drainage system/ infrastructure, including basins, with adequate quality and quantity targets achieved. The design of the residential development would address stormwater management and drainage in accordance with accepted standards and Council's Development Control Plan.	C4 = 8 acceptable.
Surface water changes and stormwater management from proposed development	Increase of impermeable surfaces and stormwater runoff and potential risk of erosion during heavy rain events, particularly after dry periods. There is a need for appropriate integration and management of stormwater and avoidance of potential impacts to receiving environment and catchment from stormwater leaving the site.	C3 = 13 unacceptable.	Stormwater runoff would be captured by drainage system/ infrastructure, including basins, with adequate quality and quantity targets achieved. The design of the residential development would address stormwater management and drainage in accordance with accepted standards and Council's Development Control Plan.	C4 = 8 acceptable.

Surface water and sediment laden runoff	Potential for sediment laden or contaminated runoff from construction activities.	D5 = 2 acceptable.	There are no adverse impacts expected given the topography of the land and setbacks to residential lots.	D5 = 2 acceptable.
Rubbish dispersal	Potential for rubbish dispersion onto adjoining land from residential development.	C3 = 13 unacceptable.	The residential subdivision will be serviced by Council's waste collection service. Measures will also be incorporated into the stormwater management system to capture litter and rubbish.	D4 = 5 acceptable.
Use of Agricultural/ Horticultural Sprays	Spray drift associated with weed management has the potential to adversely affect the residential development. it is assumed that spray drift would generally be limited.	C3 = 13 unacceptable.	All landholders are required to incorporate reasonable and practicable measures to protect the environment in accordance with the POEO Act and associated industry specific guidelines and are subject to workplace health and safety, and guidelines for the use and handling of agricultural chemicals.	C4 = 8 acceptable.
Threats to biosecurity	This could include the introduction of diseases and parasites and the introduction and spread of weeds.	C3 = 13 unacceptable.	Adequate boundary/ exclusion fencing during construction and operation of the development (the site will be fenced with dog-proof fencing). In NSW everyone has a general biosecurity responsibility under the Biosecurity Act 2015 to prevent, minimise and avoid the risk of from weeds. During construction only clean machinery would be brought to site, disturbed ground would be stabilised progressively, and appropriate management measures implemented to prevent the possible spread/ tracking of soil and weeds.	D4 = 5 acceptable.
Domestic animals	Domestic animals, including dogs, may get lost and chase or attack livestock.	C3 = 13 unacceptable.	The residential lots and boundaries will be fenced with dog-proof fencing and all residential rear yards would be securely fenced. There are Council policies for ownership of pets and associated responsibility (registration/ microchipping etc).	C4 = 8 acceptable.
Traffic and access	Potential conflict between existing traffic and additional residential vehicular	C3 = 13 unacceptable.	A Traffic Impact Assessment has been prepared by Motion Traffic Engineers for the planning proposal to address the impact of the proposed development on the operation of adjacent roads. It found there are no	C4 = 8 acceptable.

	generation along Boureong Drive.		general traffic engineering reasons why a development consent for the proposed subdivision at 18 Boureong Drive, Gunning should not be granted. Additionally, TfNSW reviewed the report and advised no objection to the planning proposal.	
Bushfire	The site is not in an identified bushfire prone area.	-	The site is not in an identified bushfire prone area.	-
Biodiversity	Impact of flora and fauna and general biodiversity.	C3 = 13	A Biodiversity Assessment Report prepared by Macrozamia Environmental states there are no biodiversity issues associated with this proposal and the net negative impact of this proposal on flora and fauna and biodiversity generally will be negligible.	D5 = 2 acceptable
AVERAGE		**11.7**		**6.25**

In general, it is desirable to achieve a conflict risk ranking of not greater than 10. As such it is considered that the proposed development as assessed would have a very low risk of conflict.

4 CONCLUSION

The land use conflict risk assessment presented in Section 3, particularly Table 3.5, has identified and evaluated a range of potential land use conflicts between the future residential development of the subject site and surrounding land uses in the rural landscape. The current proximal/ adjoining rural activity is small scale cattle and sheep grazing and associated land management activities along Boureong Drive and Ryan Place. Most of the potential conflicts identified in this LUCRA are of low risk. The following matters were identified as being ranked as potentially unacceptable (though still not significant) prior to taking into account mitigating factors and/ or control methods. These include the following matters associated with adjoining grazing/ land management activity and the interface with the proposed residential development:

- Noise.
- Odour.
- Runoff and erosion management during development construction.
- Surface water changes and stormwater management from proposed development.
- Use of Agricultural/ Horticultural sprays.
- Threats to biosecurity.
- Domestic animals.
- Traffic and access.
- Rubbish Dispersal.
- Bushfire.
- Biodiversity.

Of the above, water runoff, stormwater and erosion management, threats to biosecurity, domestic animals, and traffic/ access can be managed through common/ standard measures. These matters have been assessed in Table 3.5 as being manageable, with an acceptable residual risk, based on design outcomes and engineering requirements and associated specialist assessments that would be required as part of the subdivision design and proposal anyway (i.e. to address relevant LEP and DCP provisions and standards). Potential impacts from adjoining rural activities, including possible noise, dust and spray drift from weed/pasture management, and odour were not considered high risk or considered to be unmanageable. Yet even with low or moderate risk there is still the potential for conflict when introducing new urban residential uses in proximity to rural land. The proposed arrangement in this instance is considered to be acceptable and justified as follows:

- There is no notable risk of rural land use conflict along the site's eastern boundary. This is the only adjoining property boundary.
- There is no notable risk of rural land use conflict along the site's northern boundary being Ryan Place and rural residential development.
- There is no notable risk of rural land use conflict along the site's southern boundary being Sands Street and residential development.
- There is no notable risk of rural land use conflict along the site's western boundary being Boureong Drive and rural residential development and the GSTP.
- Proximal surrounding rural activities have been assessed and do not pose a significant risk of conflict. Minor risk is present and can be reasonably manageable.
- More intensive plant-based agriculture and cropping is not present in the area.
- Scheduled activities and other industrial land uses are not present in the area.
- The strategic, local, and site-specific circumstances justify development of the land for residential purposes and whilst there are some active rural interfaces, those nearby are generally limited to grazing and land management activities. These are not considered significant risks, nor does the immediate adjoining land represent significant or protected farmland, or widespread/ intensive rural activity. Therefore, the activity that is present at the relevant interfaces is considered manageable. Overall, the identified potential risks are generally low and can be reasonably managed to reduce risk to an acceptable level. This LUCRA has demonstrated that subject to the incorporation of expected soft landscaping, and proposed boundary fencing, the proposed development would be acceptable, and is

not expected to increase, substantially alter, or likely cause unacceptable or significant land use conflict. Some limited risk associated with immediately adjoining grazing and farming activities is present.

- Stormwater and traffic management, which are required as part of the normal DA process, would be subject to engineering design solutions and specialist assessments will be prepared to demonstrate satisfactory outcomes.
- The proposed planning proposal is therefore consistent with the intent and relevant legislation and it is noted that a number of factors have led to this conclusion, including:
  - Low intensity cattle grazing generally presents low potential risk of conflict with such activities generally tolerable even though they can be subjective, noting that future residents should recognise they are purchasing in a broader rural context.
  - Nearby agricultural spraying is done periodically by spot/ targeted spraying. Given the use of a targeted application, it is assumed that spray drift would generally be limited.
  - Noise associated with rural activity which may lead to potential land use conflict in the locality would be intermittent background noise from animals, tractors and other machinery.
  - The subdivision design incorporates measures that are appropriate to mitigate any potential impacts from odour from adjoining rural operations given the scale and intensity of activities. This, combined with soft landscaping of the residential lots is sufficient considering the nature and scale of activities at this site. The GSTP will not impact the site as noted in the Odour Impact Assessment.
- The conflict risk ranking of 6.25 indicates that the proposed development as assessed would have a very low risk of conflict.

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BIODIVERSITY ASSESSMENT REPORT

PLANNING PROPOSAL

Lot 4 DP 1198749

18 Boureong Drive, GUNNING, NSW

Gundungurra Country

October 2024

Version	Final
Date	4 November 2024
Project Number	140278

Abbreviations

APZ	Asset protection zone
BAM	Biodiversity Assessment Method
BAM-C	Biodiversity Assessment Method Calculator
BC Act	Biodiversity Conservation Act 2016 (NSW)
BC Regulation	Biodiversity Conservation Regulation 2017 (NSW)
SEPP (Biodiversity and Conservation)	State Environmental Planning Policy (Biodiversity and Conservation) 2021
BDAR	Biodiversity Development Assessment Report
BOAMS	Biodiversity Offsets and Agreement Management System
BOS	Biodiversity Offsets Scheme
CEEC	Critically endangered ecological community
DBH	Diameter at breast height over bark
EC	Ecological community listed under the EPBC Act
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999 (Cwlth)
EP&A Act	Environmental Planning and Assessment Act 1979 (NSW)
EEC	Endangered ecological community
HTW	High threat weed
IBRA	Interim Biogeographic Regionalisation for Australia
LLS Act	Local Land Services Act 2013 (NSW)
MNES	Matters of national environmental significance
NPW Act	National Parks and Wildlife Act 1974 (NSW)
PCT	Plant community type
REF	Review of Environmental Factors
SAII	Serious and irreversible impact
SEARs	Secretary's Environmental Assessment Requirements

TBDC	Threatened Biodiversity Data Collection
Transport	Transport for NSW
TEC	Threatened ecological community
VEC	Vulnerable ecological community
Vegetation SEPP	State Environmental Planning Policy (Vegetation in Non-Rural Areas) 2017 (NSW)

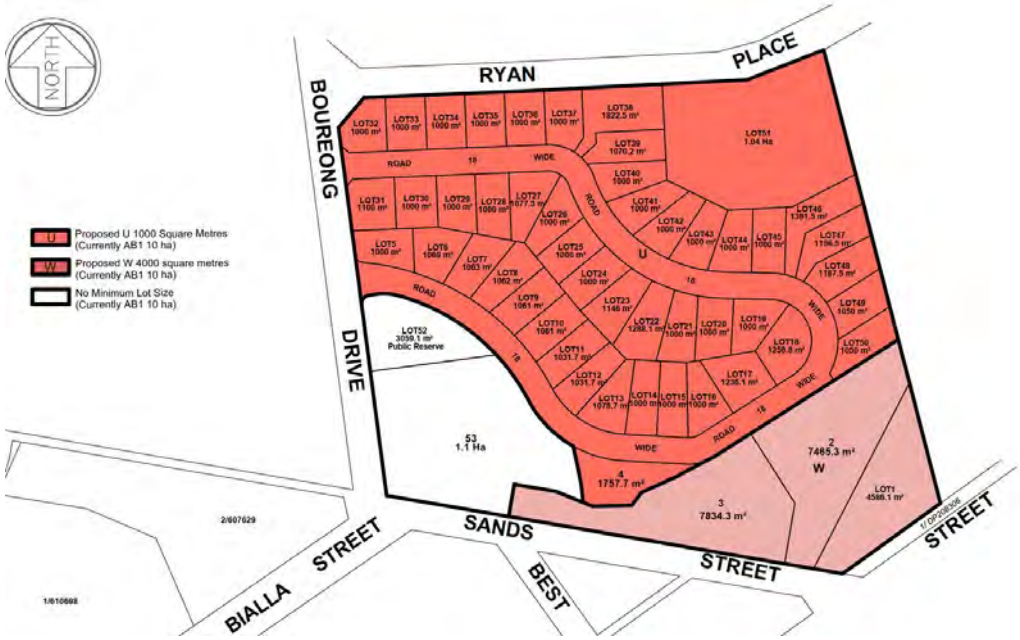
Contents

1. Introduction

1.1 Planning Proposal

1.1.1 Proposal overview

The proponent of the planning proposal seeks to amend the Upper Lachlan Local Environmental Plan 2010 for the site of Lot 4 DP 1198749, 18 Boureong Drive, Gunning to change the zoning from RU4 Rural Small Holdings and to reduce the minimum lot size from 10ha. Proposed zonings are RU5 Village, RE1 Public Recreation, C3 Environmental Management & MU1 Mixed Use Zone and proposed minimum lot sizes of 1000m^2 in RU5 and 4000m^2 in C3. Plans 1-1 and 1-2 below detail the proposal.



Plan 1-1; Proposed minimum lot size for subject land

Plan 1-2; Proposed Zoning for subject land

Subsequent land uses that may result following adoption of a planning proposal must be considered to adequately assess potential biodiversity impacts, to achieve this, the proponent has provided the following conceptual subdivision design, Plan 1-3, that would likely be developed if the planning proposal is successful. This design has been prepared through an iterative process with consideration of biodiversity values of the subject land following site investigations and surveys undertaken as part of the preparation of this Biodiversity Assessment Report. Detailed plans are provided in the Planning Proposal.

Plan 1-3; Conceptual subdivision design for subject land that may follow adoption of the Planning Proposal

Any subsequent development of the subject land would be considered through a development application and assessed in the planning environment at the time.

8

1.1.2 Location

The 13ha subject site, Lot 4 DP 1198749, 18 Boureong Drive, Gunning, NSW, occurs in a rural/ village landscape to the northeast of Gunning in the south of the Upper Lachlan Local Government Area. The site is 39km to the east of Yass and 49km to the west of Goulburn in the Southern Tablelands. The location of the proposal is shown in Map 1-1 of this report and the assessment area in Map 1-2.

1.1.3 Site Description

The assessment area occurs in a rural environment, grazing has been the dominant landuse since settlement however in more recent years large lot rural lifestyle development has occurred. Being on the edge of the Gunning Village lands to the south support residential lots with associated housing, roads and other associated infrastructure. Nearby the village sewerage treatment facility occurs.

The regularly shaped lot occurs at 600 to 580m asl and slopes gently – for the most part – to the southwest, it is drained by a first order ephemeral stream to Meadow Creek and the Lachlan River 6.2km downstream. Soils are granitic and there are several patches of floating rock embedded in the soil, rocky areas area rarely complex, fissures & multi-level stacks are infrequent.

The first order stream traversing the southeast quarter of the subject land drains a small catchment of agricultural lands. Within the subject land it offers a range of microclimates and supports mostly exotic vegetation, however, native woodland and wetland plants occur.

The subject site has been cleared of native vegetation and managed for agriculture for well over 100 years, remnants of original vegetation remain represented by two mature trees, a handful of younger trees have regenerated in the past 5 years or so. Native understory species are absent however the exotic Hawthorn and thickets of Blackberry form a sparse understory. The groundcover is almost entirely common local pasture species, typically Phalaris. Environmental weeds occur including Serrated Tussock however they are generally not prolific. Photos 1-1 to 1-3 illustrate the nature of the site.

Photo 1-1; Oblique aerial view of the subject land, boundary indicated, from the west facing east, patches of Blackberry, Hawthorn and African Boxthorn can be seen across much of the site, the brown tinge in grassland south of the house is St Johns Wort, the creek traversing the southern corner can be seen including eucalypts that occur on the creek

Photo 1-2; example of embedded granite rock which is common on the mid slope of the subject land

Photo 1-3; typical vegetation of the subject land, Phalaris dominant exotic pasture with clumps of Blackberry, Hawthorn and African Boxthorn.

1.2 Purpose of this Biodiversity Assessment Report

Terminology used in this report aims to be consistent with the NSW Biodiversity Assessment Method 2020;

- Assessment area refers to the local environment surrounding the subject land, 1500m buffer of the subject land
- Subject land refers to the parcel of land containing the proposed development;
    - Lot 4 DP 1198749.
    - Part of adjoining road reserves to the south and west of Lot 4 DP 1198749.
- Development footprint refers to the areas of direct impacts of the proposal, it includes the footprint of the development and any ancillary works, facilities, accesses and hazard reduction zones that support the construction or operation of the development. The conceptual development footprint is identified in Plan 1-3 of this report.

The purpose of this report is to identify and assess the terrestrial biodiversity, including flora, fauna and ecological communities occurring in the subject land and the likely impacts of the proposed development on these matters, with consideration of the site's landscape context. This report addresses the legislative framework below;

1) The Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act):
    a. Biodiversity Matters of National Environmental Significance.

       Identification of protected matters at risk of impact and assessment of significance of any impact.

2) NSW Biodiversity Conservation Act 2016 (BC Act):
    a. Part 6 Biodiversity offsets scheme:

       Application of the BAM in relation to this proposal & potential future development.

    b. Part 4, Divisions 2 and 5:

       Consideration of listed species, ecological communities and key threatening processes to be considered under s7.3.

    c. Section 7.3:

       Test of Significance, for determining whether the proposed development or activity is likely to significantly affect threatened species or ecological communities, or their habitats.

3) State Environmental Planning Policy (Biodiversity and Conservation) 2021:
    a. Chapter 4 Koala habitat protection 2021.

   The Koala SEPP has been addressed in Section 7 of this report.

4) Upper Lachlan Local Environmental Plan 2010 (LEP):
    a. Clause 6.2 – Biodiversity:

       The objectives of this clause are to protect, maintain or improve the diversity of the native vegetation, including:

       (a) protecting biological diversity of native flora and fauna, and

       (b) protecting the ecological processes necessary for their continued existence, and

       (c) encouraging the recovery of threatened species, communities or populations and their habitats.

   This clause applies to development on land that is identified as “Biodiversity” on the Terrestrial Biodiversity Map.

   The whole of the subject land is mapped as ‘Biodiversity’ by this map and this report addresses each part of this clause.

5) Local Planning Directions for Planning Proposals

Local Planning Directions (March 2022) issued by the Minister for Planning under section 9.1(2) of the Environmental Planning and Assessment Act 1979 address biodiversity matters as follows;

Ministerial Planning Direction 1.1 Implementation of Regional Plans

Direction 1.1 requires that planning proposals be consistent with a Regional Plan. The Draft South East and Tablelands Regional Plan 2041 applies to the subject land. In this plan;

Objective 5: Protect important environmental assets, encourages validated High Environmental Value (HEV) land be mapped and protected in Local Environmental Plans (LEPs). HEV land includes threatened ecological communities and key habitats, and important vegetation areas which have been identified on the subject land.

Objective 6: Enhance biodiversity, habitats and the connections between them, highlights the value of connectivity features and their role maintaining biological diversity across the landscape including vegetative and aquatic corridors.

This report provides recommendations, based on its findings, to ensure HEV lands on the subject land are protected in the Upper Lachlan Local Environmental Plan 2010 through

mapping under Clause 6.2 – Biodiversity. This includes any areas of likely threatened species habitat and lands supporting habitats of particular value to native biodiversity. The design of the proposal and the conceptual subdivision has also considered areas of greater environmental value avoiding development along the creek line where the greatest biodiversity occurs and reduced the intensity of development in these areas.

Ministerial Planning Direction 3.1 Conservation Zones

Direction 3.1 requires that a planning proposal must include provisions that facilitate the protection and conservation of environmentally sensitive areas.

This report provides recommendations, based on its findings, to ensure environmentally sensitive areas on the subject land are protected in the Upper Lachlan Local Environmental Plan 2010 through mapping under Clause 6.2 – Biodiversity. This includes any areas of likely threatened species habitat and lands supporting habitats of particular value to native biodiversity.

1.3 Information Sources

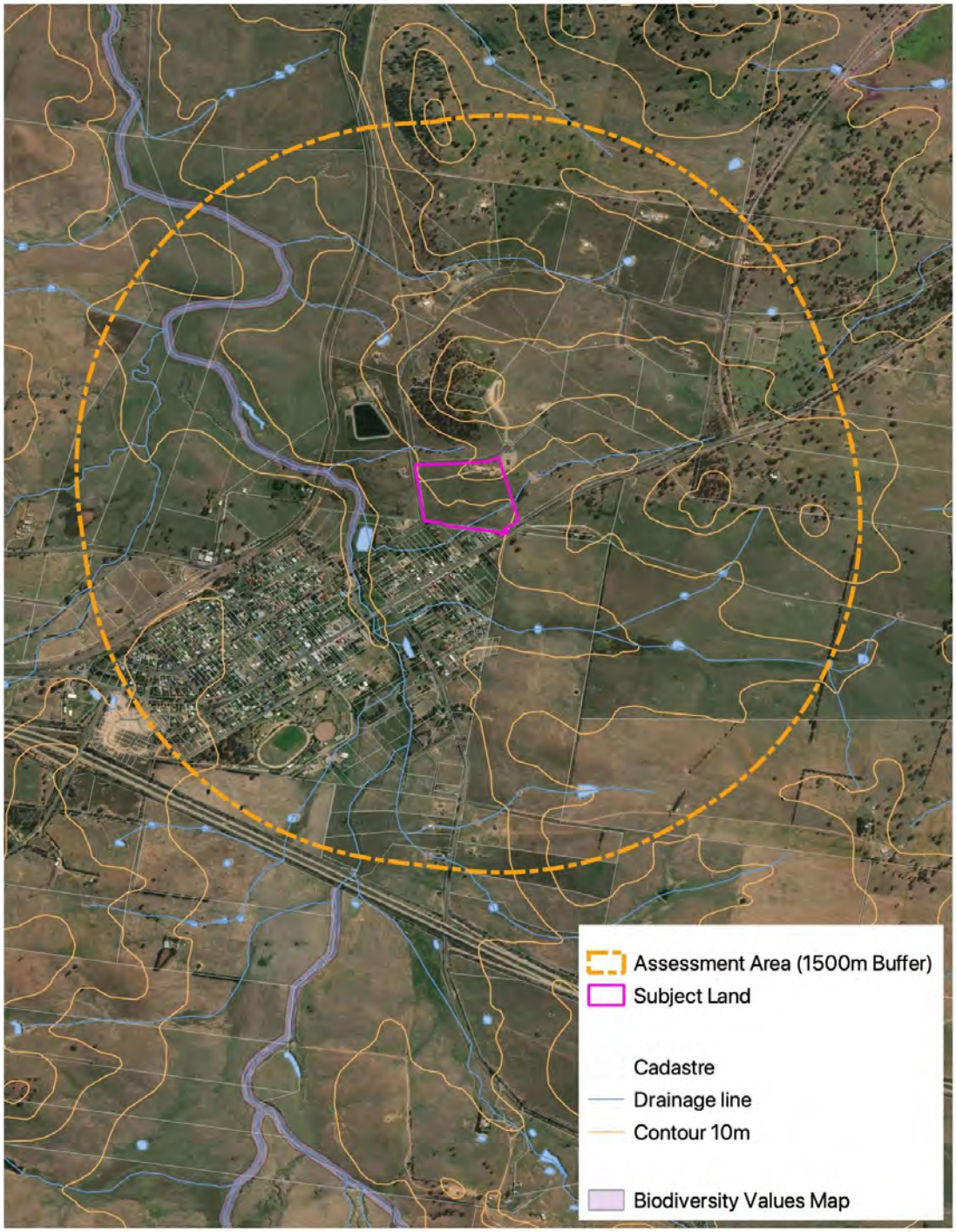
The following information sources were used in the development of this report:

- Proposal Lot Size and Land Zone Plans prepared by Laterals Planning 24 September 2024
- Conceptual Subdivision Plans prepared by Laterals Engineering & Management, 24 September 2024
- Commonwealth Government Species Profiles and Threats (SPRAT) database http://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl
- Commonwealth Department of Climate Change, Energy, the Environment and Water Protected Matters Search Tool https://pmst.awe.gov.au/#/map?lng=131.50634765625003&lat=-28.671310915880834&zoom=5&baseLayers=Imagery,ImageryLabels
- NSW Threatened Biodiversity Database Collection (TBDC) https://www.environment.nsw.gov.au/topics/animals-and-plants/biodiversity/nsw-bionet
- Australia's IBRA Bioregions and sub-bioregions http://environment.gov.au/land/nrs/science/ibra/australias-bioregions-maps
- Department of Environment and Climate Change NSW (DECC) (2002). Descriptions for NSW (Mitchell) Landscapes, Version 2.
- NSW Biodiversity Offsets and Agreement Management System (BOAMS), including BAM Calculator
- NSW Government SEED Mapping
- ePlanning spatial viewer https://www.planningportal.nsw.gov.au/spatialviewer
- NSW Biodiversity Values Map
- State Vegetation Type Map (SVTM) February 2024
- NSW Spatial Services SixMaps https://maps.six.nsw.gov.au
- Upper Lachlan Local Environmental Plan 2010
- BAM 2020

Macrozamia Environmental

Map 1-1
Subject Land and Locality

0 50 100 m


Assessment Area (1500m Buffer)
Subject Land
Cadastre
Drainage line
Contour 10m
Biodiversity Values Map
Macrozamia Environmental
Map 1-2
Subject Land &
Assessment Area
0
500
1,000 m

2 Methods

2.1 Site Context Methods

2.1.1 Landscape features

Landscape features were considered using a range of online mapping tools, see Section 1.5 above, to gain an understanding of the general nature of the site context and landscape features that relate to the subject land. Field investigations on the subject land and publicly accessible parts of surrounding lands were undertaken on 11 September 2024 to confirm and clarify findings of desktop research.

2.1.2 Native vegetation cover

Aerial photography produced by Mapbox 2024 was used to determine native vegetation cover along with vegetation mapping provided by the SVTM 2024. Ground truthing on publicly accessible areas within the assessment area, with the use of a remotely piloted aircraft mounted camera as well as familiarity with several nearby freehold lands previously surveyed confirmed native vegetation cover.

2.2 Native Vegetation, Threatened Ecological Communities and Vegetation Integrity Methods

2.2.1 Existing information

The TBDC and SCTM were considered to shortlist the likely and possible PCTs and TECs occurring in the landscape.

2.2.2 Mapping native vegetation extent

Vegetation mapping on the subject land was undertaken by traversing the project site on foot and recording the actual extent of native vegetation with a handheld gis tablet, during site investigations. During this survey, effectively a random meander survey, flora species presence was recorded, including both native and exotic species, and native vegetation mapped. The route walked for this survey is presented in Map 2-1 below, Flora Survey. Vegetation was stratified into vegetation zones based on prima facie PCT and condition was undertaken in order to define zones for plot base surveys, this could be estimated with sufficient confidence following a random meander survey, considering assemblages of plants present and extent of disturbance from past land management, the absence of vegetation or components of forest structure and familiarity with local vegetation communities. One PCT of one condition state (PCT 3376 – Low) was identified, however, it was not of adequate size for application of the BAM survey methodology.

Map 2-1 Route of native vegetation extent survey, in green dot line

2.2.3 Plot-based vegetation survey

No BAM plots were surveyed due to inadequate area of native vegetation available.

2.2.4 Vegetation integrity survey

No vegetation integrity plots were surveyed due to inadequate area of native vegetation available.

2.3 Threatened Flora Survey Methods

No BAM-C predicted flora species credit species were identified as requiring survey.

2.4 Threatened Fauna Survey Methods

No BAM-C predicted fauna species credit species were identified as requiring survey.

Threatened species recorded in Bionet as occurring within 10km of the subject site include the following;

- *Hieraaetus morphnoides* Little Eagle
- *Callocephalon fimbriatum* Gang-gang Cockatoo
- *Polytelis swainsonii* Superb Parrot
- *Climacteris picumnus victoriae* subspecies) Brown Treecreeper (eastern
- *Chthonicola sagittata* Speckled Warbler
- *Anthochaera phrygia* Regent Honeyeater (1993 record)
- *Artamus cyanopterus cyanopterus* Dusky Woodswallow

- *Melanodryas cucullata cucullata* South-eastern Hooded Robin
- *Stagonopleura guttata* Diamond Firetail
- *Pteropus poliocephalus* Grey-headed Flying-fox
- Leucochrysum albicans subsp. tricolor Hoary Sunray

The following additional species were considered as they have potential to occur in Southern Tableland grasslands/ grassy woodlands;

- *Petroica boodang* Scarlet Robin
- *Petroica phoenicea* Flame Robin
- *Aprasia parapulchella* Pink-tailed Legless Lizard
- *Delma impar* Striped Legless Lizard
- *Suta flagellum* Little Whip Snake
- *Keyacris scurra* Keys Matchstick Grasshopper
- *Synemon plana* Golden Sun Moth

Potential habitat on the site was considered for each of the above species in order to determine suitable habitats to survey with consideration of each species habitat requirements and the components of habitat present.

2.4.1 Habitat constraints assessment

Birds

Each of the threatened species of birds above has potential to occur in the landscape and may incidentally occur on or fly over the subject land on occasion. There are, however, no specific resources or habitats available that highlight the need to survey these species. It should be noted though that a hollow bearing tree occurs on the creekline and this area has potential to be recovered into habitat that may support threatened bird species with some conservation efforts.

Mammals

Similarly, the Grey-headed Flying-fox will occur in the landscape and may incidentally occur on or fly over the subject land on occasion. There are eucalypts present that, if in flower, could be foraging habitat for Grey-headed Flying-fox. As these trees were not in flower it would not have been practical to survey this species. No other habitat present would be of material use to the Grey-headed Flying-fox.

Reptiles

Aprasia parapulchella inhabits sloping, open woodland areas with predominantly native grassy groundlayers, particularly those dominated by Kangaroo Grass (*Themeda australis*) which is not habitat present, the survey guidelines for this species require turning suitably sized rocks which are very sparse on the subject land.

Delma impar is mainly found in Natural Temperate Grassland or in secondary grassland nearby. No Natural Temperate Grassland occurs nearby with any continuity with the subject land. The survey guidelines require targeting suitable habitat “all PCTs on the subject land associated with the species in the TBDC” and no habitat on or near the subject land is suitable habitat.

Suta flagellum occurs in Natural Temperate Grasslands and grassy woodlands as well as secondary grasslands derived from these ecosystems. Its habitat is also associated with scattered loose rocks. None of these habitat components are present on the subject land as

grasslands present are exotic. Phalaris is dominant and rocky areas are embedded granitic boulders not suitable to this species.

Insects

Keyacris scurra is generally known from native grassland or grassy woodland sites, no such habitat occurs on the subject land. It also prefers Themeda triandra grasslands with asteraceae present which it feeds on. These habitats are not present. While it is known to feed on several exotic species that were recorded including Sorrel, Sweet Briar & Clover it is unlikely that the exotic composition of the grassland present would support a population of this species. Consideration was given to this species during the native vegetation survey/ random meander observing insects moving from the path of footsteps and it was not found.

Synemon plana occurs in Natural Temperate Grasslands and grassy Box-Gum Woodlands in which groundlayer is dominated by wallaby grasses *Austrodanthonia spp*. These habitats are not present in the subject land. The grassland present is generally dense Phalaris which is not suited to this species.

Plants

The threatened daisy, *Leucochrysum albicans subsp. tricolor* (Hoary Sunray) is not uncommon in the Southern Tablelands and was noted to be in flower at many other sites at around the time of site visits. Given that it is known to have been in flower at the time, is easily identified in flower or not and was not recorded during the native vegetation surveys undertaken on 11 September 2024 it can be confidently considered to be absent.

As no suitable habitat is present for these species a species polygon could not be prepared and targeted surveys were not undertaken.

2.4.2 Review of existing information

The Threatened Biodiversity Database Collection including the Office of Environment and Heritage Species Profiles and NSW Scientific Committee determinations were used to gain a full understanding of the species.

2.4.3 Field surveys

Due to an absence of suitable habitat no targeted threatened species surveys were undertaken.

2.5 Weather Conditions

Recent years have been wetter than average, this may change the typical floral composition of the site though is unlikely to have impacted the detectability of target species. Days leading up to surveys and during surveys experienced a wide variety of weather conditions including rain. Table 2-1 below documents conditions at the time of survey.

Table 2-11 Environmental conditions during threatened species surveys

Survey undertaken (e.g. method / targeted species)	Date	Time	Temp	Wind	Rainfall	Other conditions relevant to the species
Native vegetation survey/ random meander.	11 Sept. 2024	1200 - 1800	10°C to 27°C	Calm	Rain not recorded on day of survey. Periodic rain had occurred over previous week.	6 - 7 oktas cloud cover, nimbostratus

3 Site Context

3.1 Assessment Area

As a site based development a 1500m buffer was applied to the subject land to define the assessment area as identified in Map 1-2.

3.2 Landscape Features

Landscape features identified within the subject land and assessment area are shown on Map 1-1 and Map 1-2 where relevant. A discussion of relevant landscape features is provided below

3.2.1 IBRA bioregions and IBRA subregions

Bioregions are large, geographically distinct areas of land with common characteristics such as geology, landform patterns, climate, ecological features, and flora and fauna communities.

The assessment area occurs wholly within the Murrumbateman IBRA subregion, within the South Eastern Highlands IBRA bioregion. The South Eastern Highlands bioregion lies just inland from the coastal bioregions of the South East Corner and the Sydney Basin, bounded by the Australian Alps and South Western Slopes bioregions to the south and west. The South Eastern Highlands Bioregion includes most of the Australian Capital Territory and extends south into Victoria.

3.2.2 Rivers, streams, estuaries and wetlands

The subject land drains to the southwest to an unnamed first order stream that drains a small catchment agricultural to the east of the subject land. Run-on water is minimal as the land occurs on an upper slope and drainage associated with Ryan Place on the northern side of the lot directs surface flows away from the site. No other surface water features occur on the subject land. Run-off water reaches Meadow Creek 650m downstream of the subject land and is part of the Lachlan River Catchment which is located over 6km downstream.

Meadow Creek is the only third order stream occurring in the assessment area, several first order and few second order streams occur. Several small farm dams throughout the assessment area, typically on first order drainage depressions and often higher in the catchment and less than 0.25ML capacity. Two water storages associated with the sewerage treatment facilities nearby holding approximately 1.2ML 230m to the southwest and 5ML, 160m to the northwest. The larger water storage is recently constructed and is yet to develop riparian and aquatic vegetation limiting its value to biodiversity, it was observed from the road and no fauna were recorded making use of it.

3.2.3 Habitat connectivity

Habitat forming connectivity for flora and fauna is limited, the majority of vegetation adjoining the subject land and throughout the assessment area is cleared agricultural lands dominated by exotic pasture species, much like the subject land. Throughout the village of Gunning landscaping of open spaces and residential gardens includes a high diversity of vegetation, while exotic and mostly deciduous, this provides habitat to a range of biodiversity dominated by common native and exotic species.

Fragmented patches of native woodland occur in the assessment area to the east and north of the subject land. Given the landscape is over-cleared, particularly impacting native woodland, these remnants are a valuable connectivity and biodiversity feature in the landscape. The stream traversing the subject land continues upstream to the east providing habitat for scattered woodland trees and continuity with other areas of woodland. This connectivity is valuable for biodiversity in the landscape and on the subject land, the low protected position in the landscape, the chain of microclimates centred on pools in the waterway, the greater diversity of vegetation in the riparian area and the canopy, while

fragmented, all contribute to a corridor that allows biodiversity including flora and fauna to traverse the landscape that is otherwise adverse to dispersal for most native species. Its position in the landscape between Meadow Creek and woodland areas to the east make this watercourse particularly useful to local biodiversity.

3.2.4 Karst, caves, crevices, cliffs, rocks or other geological features of significance

No karst or cave features occur in the assessment area. No coastal cliffs occur in this area or significant areas of cliffs or exposed rock and crevice.

3.2.5 Areas of outstanding biodiversity value

No areas of outstanding biodiversity value, as identified under the BC Act occur within the subject land, assessment area or nearby.

3.2.6 NSW (Mitchell) landscape

The subject land and eastern majority of the assessment area occur within the Gunning Hills NSW (Mitchell) landscape and the western third of the assessment area occurs within the Breadalbane Swamps and Lagoons & Dalton Hills NSW (Mitchell) landscapes.

3.3 Native Vegetation Cover

Vegetation within the subject land, and within the 1500 metre buffer assessment area, was assessed using aerial photograph interpretation, field investigation and SVTM mapping. Table 3-1 below summarises the extent of native vegetation cover within the assessment area shown on Map 1-2.

Table 3-1 Native vegetation cover in the assessment area

Assessment area (ha)	930
Total area of native vegetation cover (ha)	56
Percentage of native vegetation cover (%)	6
Class (0-10, >10-30, >30-70 or >70%)	>0-10

4 Native Vegetation, Threatened Ecological Communities and Vegetation Integrity

4.1 Native Vegetation Extent

The majority of the subject land is exotic vegetation and subject to agricultural management that promotes exotic pasture. The whole of the site was traversed to map native vegetation during a spring survey to maximise the potential for native grasses to be recorded. Map 4-1 below illustrates native vegetation recorded on the subject land along with SVTM in the vicinity.

Map 4-1; Native vegetation extent mapped during site survey

4.1.1 Changes to the mapped native vegetation extent

Field investigations indicate SVTM mapping on the subject site is generally accurate, nearby mapped SVTM polygons were found to overestimate native vegetation.

Aerial photography over several years shows the development footprint has been subject to a range of land management pressures for a long period of time, Map 4-2 below for example shows the subject land in 2015 was heavily grazed, brighter vegetation typical of exotic species, in this case African Boxthorn or Hawthorn are common. The darker green woody vegetation in this image are trees that are recorded on the site in Map 4-1 above.

Map 4-2; 2015 aerial photography suggesting native vegetation extent has not changed notably on the site for at least 10 years, eucalypts identified in Map 4-1 can be seen

4.1.2 Areas that are not native vegetation

The majority of the subject land is devoid of native vegetation, as indicated in Map 4-1. These areas, apart from the area developed as a dwelling, have been managed for agriculture for many years as a result the grassland is an exotic pasture dominated by Phalaris, clovers are also common and in some areas Yorkshire Fog. Blackberry, Hawthorn and African Boxthorn are also common and widespread. In the area of the creek a greater diversity of plants occur however exotics mostly dominate. A full list of flora recorded is provided in Appendix 1.

4.2 Plant Community Types

4.2.1 Overview

Native vegetation in the subject land has been assessed as aligning with the BioNet Vegetation Classification PCTs identified within Table 4-1 below.

Plot vegetation surveys were not undertaken due to the inadequate are of native vegetation present, such surveys would not have contributed usefully to PCT identification due to the small area available to be surveyed and the infrequency of native species in those areas. However, based on observations of nearby vegetation remnants in similar landscape profiles, native vegetation present on the site and SVTM nearby the most likely PCTs have been assigned. Detailed descriptions of each PCT are provided in the following subsections.

Table 4-1 PCTs identified within the subject land

PCT ID	PCT name	Subject land area (ha)
3376	Southern Tableland Grassy Box Woodland	0.289
Not native vegetation	N/A	12.711
Total area		13

4.2.2 Southern Tableland Grassy Box Woodland

PCT 3376 is described as;

> *A tall sclerophyll woodland with a dry shrub layer that is patchy to absent and a mid-dense, grassy groundcover, widespread in the low hills of the drier parts of the Southern Tablelands between Bredbo and Rylstone. The canopy almost always includes box eucalypts (Eucalyptus melliodora or Eucalyptus bridgesiana), occasionally associated with Eucalyptus blakelyi which may be locally prominent in lower parts of the landscape. The shrub layer is sparse to absent with occasional, scattered Melichrus urceolatus, Lissanthe strigosa or various Acacia species. The mid-dense ground layer typically includes grasses, forbs, graminoids and some twiners, very frequently including Hydrocotyle laxiflora, Austrostipa scabra, Lomandra filiformis, Microlaena stipoides and Elymus scaber. The PCT primarily occurs in the Bredbo, Canberra, Goulburn and Boorowa areas, with more scattered occurrences extending north to Bathurst, Orange and Rylstone. It occurs on granite, volcanic and sedimentary substrates in cold, dry environments with a mean annual rainfall typically below 760 mm. While widespread, this PCT primarily occurs in small, often disturbed patches with a long history of grazing. It is not closely related floristically to nearby PCTs, however it grades into PCT 3373 which has a more diverse shrub layer and some subtle differences in canopy species. Eucalyptus macrorhyncha, Eucalyptus dives, Bossiaea buxifolia, Dillwynia sericea and Brachyloma daphnoides are only occasional in PCT 3373 however collectively represent a suite of species that are rare in this PCT.*

This PCT is associated with TEC listings;

- BC Act - Critically Endangered;

  White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions

- EPBC Act - Critically Endangered

  White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland

  Photos of this PCT on the subject land are provided below;

Photo 1; PCT 3376, one mature *Eucalyptus melliodora* close to the existing dwelling, some young regeneration is occurring, less than 2 years old. The understory and groundcover are exotic

Photo 2; PCT 3376, one mature *Eucalyptus rubida* occurring in creek line, several other trees have regenerated nearby of 5 – 15 years. The understory and groundcover are exotic however occasional native forbs were recorded along with Typha sp. in the creek

Photo 3; the larger of two patches of *Typha domingensis*. occurring in the creek line, while not strictly PCT 3376 it is effectively a part of this community

4.2.3 Condition states

One distinct condition state for PCT Southern Tableland Grassy Box Woodland occurs in isolated fragments, often consisting of only one tree.

This condition state is very low, a canopy is present and some regeneration of trees however native species are usually absent from other strata. The only distinct exception is in the creekline where *Typha domingensis* occurs as a dense thicket, extending outside the canopy in one case.

4.2.4 Justification of PCT selection

Due to the sparseness of native species occurring on the subject land, PCTs occuring nearby were considered for indicators of an appropriate PCT to apply.

NSW SVTM mapping of PCTs maps the following PCTs as occurring (see Table 4-2 below) in the vicinity of the project area, these were considered closely as potential PCTs to apply to vegetation present. PCTs 3747, 4063 & 4085 could be easily discounted due to landscape and canopy species discrepancies.

The remaining three PCTs, 3376 Southern Tableland Grassy Box Woodland, 3366 Central Tableland Clay Apple Box Grassy Forest & 3373 Goulburn Tableland Box-Gum Grassy Forest were all considered closely. The nearby remnant vegetation was considered, particularly where it occurs in a similar landscape positions. Initially it was considered that the native vegetation on the subject land in the creek line and upper slopes could be different PCTs, however, on balance of the species occurring in nearby remnant vegetation, the canopy species occurring on the project area and landscape positions, it was found that PCT 3376 Southern Tableland Grassy Box Woodland was the most likely PCT, prior to European settlement it likely covered most of the subject land.

Table 4-2 PCTs in the vicinity of the subject land

PCT ID	PCT Name	Vegetation Formation	Vegetation Class
3376	Southern Tableland Grassy Box Woodland	Grassy Woodlands	Southern Tableland Grassy Woodlands
4085	Southwest Tableland Gorges Riparian Shrubland	Forested Wetlands	Eastern Riverine Forests
3366	Central Tableland Clay Apple Box Grassy Forest	Grassy Woodlands	Southern Tableland Grassy Woodlands
3747	Southern Tableland Western Hills Scribbly Gum Forest	Dry Sclerophyll Forests (Shrubby sub-formation)	Southern Tableland Dry Sclerophyll Forests
3373	Goulburn Tableland Box-Gum Grassy Forest	Grassy Woodlands	Southern Tableland Grassy Woodlands
4063	Central and Southern Tableland River Oak Forest	Forested Wetlands	Eastern Riverine Forests

4.3 Alignment with TECs

This PCT is associated with a TEC listing;

- BC Act, Critically Endangered;

  White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions

- EPBC Act Critically Endangered

  White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland.
  The vegetation on the subject land is too degraded to be defined as the EPBC TEC Listing of this community.
  The remnants present, though highly degraded are a part of the BC Act listing of this TEC.

5 Habitat Suitability For Threatened Species & Communities

5.1 Identification Of Threatened Species

Species considered for targeted survey and assessment are listed and discussed in Section 2.4. Due to an absence of suitable habitat, none of these species were considered appropriate to survey.

5.2 Threatened Ecological Communities

One TEC was recorded on the subject land;

> *White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions* (Boxgum Woodland)

Boxgum Woodland is listed as a Critically Endangered Ecological Community under the BC Act, while the examples occurring on the subject land are in poor condition states, being fragmented and represented almost exclusively by only canopy species, they are regenerating with examples of tree recruitment present.

6 Identifying Prescribed Impacts

Prescribed impacts are the impacts identified in clause 6.1 of the BC Regulation. These can be direct or indirect impacts and are additional to the impacts of native vegetation clearing. Prescribed impacts are considered in relation to the proposal in Table 6-1 below.

Table 6-1 Prescribed impacts identified

Feature	Present	Description of feature characteristics and location	Threatened entities that use, are likely to use, or are part of the habitat feature. Where relevant, threatened species or fauna that are part of a TEC or EEC, that are at risk of vehicle strike
Karst, caves, crevices, cliffs, rocks or other geological features of significance	☐Yes / ☒No	Site inspections considered the presence of and confirmed no karst, caves, crevices, cliffs, rocks or other geological features of significance occur on or nearby the subject site.	N/A
Human-made structures	☒Yes / ☐No	Structures present are rural fences, tracks, dwelling and associated structures.	These human made structures are basic steel post and wire construction or conventional masonry are not likely to be in use by or a habitat feature for any threatened entity due to their simple design and lack of habitat values.
Non-native vegetation	☒Yes / ☐No	Non-native vegetation occurs across the whole subject land including grasses and shrubs	Exotic grassland is unlikely to be important to threatened species due to its monocultural and exotic nature. The widespread Blackberry, Hawthorn and African Boxthorn may be of use to small threatened birds such as the Speckled Warbler, Diamond Firetail, Scarlet Robin or Flame Robin. Any use is unlikely to be important to the species which would prefer native vegetation available elsewhere in the landscape.
Habitat connectivity	☒Yes / ☐No	The subject land has some	The proposal will not impede habitat connectivity. The proposal is an

Feature	Present	Description of feature characteristics and location	Threatened entities that use, are likely to use, or are part of the habitat feature. Where relevant, threatened species or fauna that are part of a TEC or EEC, that are at risk of vehicle strike
		continuity to areas of native vegetation via the creek line traversing the southern third of the site.	opportunity to recognise the biodiversity value of this part of the land and implement planning controls that protect and enhance its value.
Waterbodies, water quality and hydrological processes	☐Yes / ☒No	Waterbodies are not present on the development area	N/A
Wind turbine strikes (wind farm development only)	☐Yes / ☒No	Windfarm development not proposed	N/A
Vehicle strikes	☒Yes / ☐No	The proposal will likely result in development that includes roads	The parts of the subject land likely to include roads are not in areas of important connectivity features. The conceptual subdivision design does not require roads across the parts of the site that are of value to fauna movement.

7 State Environmental Planning Policy (Biodiversity and Conservation) 2021

The State Environmental Planning Policy (Biodiversity and Conservation) 2021 (BC SEPP) consolidates several repealed SEPPs that help to manage conservation of biodiversity.

7.1 BC SEPP Chapter 4 Koala Habitat Protection 2021

This Chapter would apply to the subject land if the planning proposal is successful, it aims to encourage the conservation and management of areas of natural vegetation that provide habitat for koalas to support a permanent free-living population over their present range and reverse the current trend of koala population decline. This Chapter states;

4.9 Development assessment process—no approved koala plan of management for land

(1) This section applies to land to which this Chapter applies if the land—

(a) has an area of at least 1 hectare (including adjoining land within the same ownership), and

(b) does not have an approved koala plan of management applying to the land.

(2) Before a council may grant consent to a development application for consent to carry out development on the land, the council must assess whether the development is likely to have any impact on koalas or koala habitat.

(3) If the council is satisfied that the development is likely to have low or no impact on koalas or koala habitat, the council may grant consent to the development application.

(4) If the council is satisfied that the development is likely to have a higher level of impact on koalas or koala habitat, the council must, in deciding whether to grant consent to the development application, take into account a koala assessment report for the development.

Potential koala habitat is present and this species could make use of the eucalypt trees occurring on the land. As koala habitat though it is poor, its low continuity with other habitat almost precludes koalas from accessing these trees requiring dispersing individuals to cross hundreds of meters of grassland to reach trees. Also, there are no nearby recent recordings of koalas.

Additionally, the planning proposal aims to protect the eucalypt trees occurring on the site and changing land zoning to C3 Environmental Management, where most eucalypts occur, will improve prospects for regeneration of a vegetation community with potential to support koalas.

Consequently the proposal is likely to have low or no impact on koalas or koala habitat.

8 NSW Fisheries Management Act 1994

The Fisheries Management Act 1994 provides for the protection of fish and marine vegetation, endangered populations and ecological communities by a listing process. No species, populations or communities listed under this act were recorded on site at the time of this assessment or are considered likely to occur on this site. No Tests of Significance have been prepared for species protected by this act in relation to the proposed development.

8.1 Key Fish Habitat

The creek line on the subject land does not meet the definition of Key Fish Habitat, it is not mapped as Key Fish Habitat and does not meet the DPI guidelines for the definition of key fish habitat due to its ephemeral nature. Key Fish Habitat mapping along with the DPI threatened fish mapping are shown on Map 8-1 below, these show the nearby Meadow Creek is mapped as Key Fish Habitat and as habitat for the threatened fish Southern Pygmy Perch. Due to the poor quality of aquatic habitat on the subject land and its distance from Meadow Creek it is not likely Southern Pygmy Perch habitat would extend into the project area.

Map 8-1; DPI Key Fish Habitat (blue) and Threatened Fish habitat - Southern Pygmy Perch (green broken line) in relation to the subject land

8.2 Aquatic Environment

The aquatic environment in the vicinity of the subject land is characterised by ephemeral pools linked by shallow ephemeral muddy drainage depressions. Past land uses have impacted riparian and aquatic vegetation which has been simplified from that which would be

expected in a natural environment. Aquatic and riparian vegetation is almost entirely exotic however two small patches of Cumbungi occur as well as a eucalypt canopy in some parts. See Photo 8-1 below of the creek line traversing the project area and Photo 8-2 showing aquatic habitats.

Photo 8-1; Creek line (blue broken line) traversing the subject land (boundaries indicated), most riparian and aquatic vegetation is exotic

Photo 8-2; Wettest part of creek line, a shallow ephemeral pool with muddy substrate. Typha is present however most vegetation is exotic

8.3 Aquatic Fauna Records and Observations

No fish were recorded at the site however it is expected yabby, *Cherax destructor* may occur as well as other invertebrates.

Brown Toadlet (*Pseudophryne bibronii*) and Common Eastern Froglet (*Crinia signifera*) were heard during surveys.

The nearby Meadow Creek is mapped by the NSW Fisheries Spatial Data Portal, as potential threatened species habitat for southern pygmy perch (*Nannoperca australis).* This is small fish, growing to approximately 65-85 mm in length. It occurs in small systems with a low flow rate and quiet vegetated areas in streams, billabongs & lakes. They prefer sheltered habitats and are not usually found in open water. It is highly unlikely this species could occur on the subject land due to inadequate aquatic habitat.

No other aquatic threatened or protected species, populations, ecological communities are expected to occur due to lack of continuity with known threatened species habitat. No 'critical habitat' listed under the FM Act or EPBC Act occurs nearby.

8.4 Aquatic Habitat Type and Waterway Class

NSW DPI Policy and guidelines for fish habitat conservation and management Update 2013 provides guidance to assess sensitivity and apply Parts 2 and 7 of the FM Act. Fish habitat sensitivity is the importance of the habitat to the survival of fish including all aquatic invertebrates. Table 1 of these guidelines provides a key fish habitat and associated sensitivity classification scheme.

Using this table the waterway is categorised as:

Type 2 Moderately sensitive key fish habitat being:

Freshwater habitats and brackish wetlands, lakes and lagoons other than those defined in Type 1.

Table 2 of these guidelines classifies waterways for fish passage and it factors in the functionality of the waterway as fish habitat. This assessment relates primarily to watercourses and classifies these streams using indicators such as hydraulic geometry (stream shape and size), frequency of stream flows (perennial, intermittent or ephemeral), presence of aquatic habitat units (pools, riffles, vegetation, snags), presence of threatened or protected fish species and other native fish, and connection to adjacent habitats (e.g. floodplain wetlands).

In this table, the waterway at the project area is defined as:

Class 3 Minimal key fish habitat being:

Named or unnamed waterway with intermittent flow and sporadic refuge, breeding or feeding areas for aquatic fauna (e.g. fish, yabbies). Semi-permanent pools form within the waterway or adjacent wetlands after a rain event. Otherwise, any minor waterway that interconnects with wetlands or other CLASS 1-3 fish habitats.

9 Avoid and Minimise Impacts

9.1 Avoid and Minimise Direct and Indirect Impacts

9.1.1 Project location

The proposal has been designed to complement existing village development of Gunning and confine the intensity of likely future development to areas of least value to biodiversity.

The proposal also aims to provide opportunities to protect and enhance biodiversity values on the land.

9.1.2 Project design

The proposal has been designed to avoid impacts to biodiversity, the location of the proposal is a site that is degraded and adjoins the village area of Gunning, avoiding sites where biodiversity values are more common, such as the boxgum woodland areas occurring in the local landscape. The proposal and conceptual subdivision also avoid impacts to biodiversity through avoiding development in areas of greatest biodiversity value, the smallest lots proposed occur away from the creek line and roads avoid crossing the creek line. The *eucalyptus melliodora* tree is retained and the creek line, including the remaining eucalypt trees would be included within the C3 Environmental Management Zone on larger lots ranging in size from 4,586m^2 to 7,834m^2 and of such a design to enable Restriction on User to protect the creek vegetation and for housing and associated development to have adequate area to be carried out without affecting the creek area. This provides greater protection for these biodiversity values than is currently the case and improves the likelihood of native vegetation in the creek line improving through the following:

- C3 Environmental Management Zone will attract buyers with a higher than typical interest in conservation;
- Current land zoning encourages agricultural practices that degrade biodiversity values;
- Current land ownership dilutes land management resources over a much larger area. With the creek line being managed by two landholdings over a smaller area, the resources are concentrated where needed.

The proposal and conceptual design has also considered the potential habitat continuity to habitats surrounding the subject land, the design ensures minimal interruption to potential continuity by limiting the extent of the road and retaining the continuity across the landscape.

9.1.3 Indirect impacts

During construction indirect impacts of dust, noise, erosion and sedimentation and weed spread are impacts that works may impose on adjoining and downstream lands, these will be avoided and minimised through the implementation of best management practices prescribed through management plans to be implemented during works.

9.2 Avoid and Minimise Prescribed Impacts

9.2.1 Project location

The proposal has been located in an area that largely avoids prescribed (clause 6.1 of the BC Regulation) impacts. See Section 6.

9.2.2 Project design

During the design phase it was identified that the only prescribed impacts likely are impacts to biodiversity continuity that would degrade the value of the creek line as a habitat continuity feature. The design therefore ensured that this area received a greater level of protection through land zoning as C3 Environmental Management, with larger lots and avoiding/ minimising crossing this with roads and boundaries, and placing a Restriction on User to protect the creek vegetation and habitat corridor values.

9.2.3 Summary of measures to avoid and minimise impacts

Measures implemented to avoid and minimise direct, indirect and prescribed impacts are documented below;

Action	Outcome	Timing	Responsibility
Knowledge of biodiversity values has informed decisions about the location of the proposal	The location of the proposal is on land suitable for the planning proposal and is in close proximity to the existing village of Gunning. Biodiversity values on the site have been surveyed, mapped and documented, this information has guided design by applying the C3 Environmental Management zoning and larger lots to lands of greatest value to biodiversity.	Design phase	Proponent
Biodiversity values of the local area and likely to occur onsite informed design of the proposal	Biodiversity impacts have been minimised by locating the most intense parts of the proposal in the areas of least biodiversity value, where practical, with consideration of both direct impacts to vegetation and habitat as well as indirect impacts of biological continuity.	Design phase	Proponent

10 Assessment of the Biodiversity Impact

Considering the information detailed above that has been summarised from information collected during field and desktop investigations and assessments of significance for threatened species and communities the following final assessments are made.

10.1 Direct Impacts

The proposal and likely future uses, will change the land usage from agricultural to residential including areas of open space and mixed use. The impacts on lands of poor biodiversity value are insignificant. The impacts on the creek line which is of highest biodiversity value as positive as the zoning would be changed to C3 Environmental Management with additional protective measures applied.

The objectives of this zone are;

- To protect, manage and restore areas with special ecological, scientific, cultural or aesthetic values.
- To provide for a limited range of development that does not have an adverse effect on those values.
- To facilitate the management of environmentally sensitive land and areas of high environmental value.
- To retain the significant historic and social values expressed in existing landscapes and land use patterns.
- To minimise the proliferation of buildings in sensitive landscape areas.
- To restrict the use of land to low-impact uses compatible with preserving drinking water catchments and relating to tourist activities or recreation in, or environmental enhancement of, the natural surroundings.

These objectives are significantly more conducive to the conservation and enhancement of biodiversity than the objectives of the current zoning which encourage primary industry.

10.2 Potential Impacts on Flora

Vegetation impacts will not significantly impact any threatened flora or endangered ecological communities. The proposal will not involve the removal of any important or significant vegetation, plant habitats or significantly degrade the ecological value of the project area.

The potential impacts on the eucalypt trees, particularly the habitats of the creek line have been considered in detail and measures implemented to avoid impacts. As a result, the proposal will have a positive impact on biodiversity by changing the area of most biodiversity value, along the creek line, from RU 4 Primary Production Small Lots to C3 Environmental Management. This will encourage usage and management that protects existing biodiversity values along the creek line as well as concentrating resources of land managers in a smaller area which is likely to improve the vegetation along the creek as future owners manage weeds and likely promote native vegetation.

10.3 Potential Impacts on Fauna and Habitat

Similarly to the outcomes stated above, the proposal will improve the opportunities conservation of fauna and habitat by changing the zoning to C3 Environmental Management and concentrating land management resources on a smaller area.

10.4 Mitigating residual impacts – management measures and implementation

Table 10-1 Summary of proposed mitigation and management measures for Planning Proposal

Mitigation measure	Method/ technique	Timing	Frequency	Responsibility	Likely efficacy
Provisions that facilitate the protection and conservation of environmentally sensitive areas Avoid & minimise impacts on biodiversity					
Land Zoning	The creek line on Lot 4 DP 1198749 must be contained within a Conservation Zoning in the Upper Lachlan Local Environmental Plan 2010, e.g; *Zone C3 Environmental Management*	Design phase of planning proposal	Permanent & ongoing	DoP	Low risk of failure
Minimum Lot size	The creek line on Lot 4 DP 1198749 must be contained within a minimum lot size of 4000m^2 in the Upper Lachlan Local Environmental Plan 2010	Design phase of planning proposal	Permanent & ongoing	DoP	Low risk of failure
Clause 6.2 *Biodiversity* of Upper Lachlan Local Environmental Plan 2010	Native vegetation on Lot 4 DP 1198749, as mapped in this Map 4-1 of this report and with a 10m buffer applied must be mapped as '*Biodiversity*' on the Upper Lachlan Local Environmental Plan 2010 *Natural Resources Sensitivity – Biodiversity*	Design phase of planning proposal	Permanent & ongoing	DoP	Low risk of failure

Mitigation measure	Method/ technique	Timing	Frequency	Responsibility	Likely efficacy
	Map such that Clause 6.2 *Biodiversity* applies.				
Upper Lachlan Development Control Plan 2010	Provisions of Clause 4.2.6 Biodiversity management	Design phase of planning proposal.	Permanent & ongoing	DoP	Low risk of failure
Appropriate and timely environmental assessment of future development					
Adequate assessment of biodiversity impacts to future environments	Any future Development Application to subdivide Lot 4 DP 1198749 must be accompanied by a Biodiversity Assessment that; a) Considers the specific design of the proposal b) Demonstrates avoidance, mitigation and offsetting of any biodiversity impacts & b) Meets planning requirements for biodiversity assessment current at the time of application	DA Stage	DA Stage	Local Council	Low risk of failure

11 Serious and Irreversible Impacts

11.1 Assessment for Serious and Irreversible Impacts on Biodiversity Values

No species listed as at risk of a Serious and Irreversible Impact have been found likely to use the subject land or be impacted by the proposal.

Any future development should consider the potential for impacts on entities at risk of a Serious and Irreversible Impact at the time of assessment.

12 Conclusion

This report has assessed the biodiversity, including flora and fauna, associated with the subject land and the extent and nature of impacts on biodiversity of the planning proposal with consideration of likely future land uses.

The proposal applies to Lot 4 DP 1198749, 18 Boureong Drive, Gunning and it is proposed to change the zoning from RU4 Rural Small Holdings and to reduce the minimum lot size from 10ha. Proposed zonings are RU5 Village, RE1 Public Recreation, C3 Environmental Management & MU1 Mixed Use Zone and proposed minimum lot sizes of 1000m^2 in RU5 and 4000m^2 in C3.

The biodiversity of the site has been assessed and areas of conservation value identified. This information has contributed to the design of the proposal as well as a conceptual subdivision of the site as an example of likely future land use. Through this design process the proposals potential impacts to biodiversity have been avoided and minimised and resulted in a design that improves biodiversity outcomes. The current Zoning of RU4 Primary Production Small Lots promotes agricultural uses that are not conducive to conservation of biodiversity. By changing the land zoning to C3 Environmental Management, in the parts of the site of greatest biodiversity value, land uses will encourage minimal impact activities that support the conservation of biodiversity. Additionally, by applying a minimum lot size of 4000m^2 and Restriction on User to this area, land management resources of land owners are concentrated in a smaller area improving the likelihood of weed management and native vegetation promotion along the creek line which is the greatest biodiversity asset on the land protecting several *Eucalyptus rubida* trees.

On the upper slope there is also a *Eucalyptus melliodora* tree with some young regeneration. This tree is to be retained and it is proposed it will be protected through the provisions of Clause 6.2 *Biodiversity* of Upper Lachlan Local Environmental Plan 2010.

There are no other biodiversity issues associated with this proposal and the net negative impact of this proposal on flora and fauna and biodiversity generally will be negligible.

13 References

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Appendix 1 – Flora Recorded

Family	Species	Common Name	BC Act	EPBC Act	Exotic
Apiaceae	*Eryngium ovinum*	Blue Devil			
Asteraceae	*Arctotheca calendula*	Capeweed			*
Asteraceae	*Cirsium vulgare*	Spear Thistle			*
Asteraceae	*Hypochaeris radicata*	Catsear			*
Asteraceae	*Onopordum acanthium subsp. acanthium*	Scotch Thistle			*
Asteraceae	*Tanacetum vulgare*	Tansy			*
Boraginaceae	*Echium plantagineum*	Patterson's Curse			*
Caryophyllaceae	*Cerastium glomeratum*	Mouse-ear Chickweed			*
Caryophyllaceae	*Petrorhagia nanteuilii*	Proliferous Pink			*
Clusiaceae	*Hypericum perforatum*	St. Johns Wort			*
Cupressaceae	*Juniperus sp.*	Juniper			*
Cyperaceae	*Carex inversa*	Knob Sedge			
Fabaceae (Faboideae)	*Genista monspessulana*	Broom			*
Fabaceae (Faboideae)	*Trifolium fragiferum*	Strawberry Clover			*
Gentianaceae	*Centaurium spp.*				*
Geraniaceae	*Geranium solanderi*	Native Geranium			
Goodeniaceae	*Goodenia hederacea*	Ivy Goodenia			
Juncaceae	*Juncus acutus*	Sharp Rush			*
Juncaceae	*Juncus capitatus*				*
Myrtaceae	*Eucalyptus melliodora*	Yellow Box			
Myrtaceae	*Eucalyptus rubida subsp. rubida*	Candlebark			
Oleaceae	*Ligustrum lucidum*	Broad-leaf Privet			*
Plantaginaceae	*Plantago lanceolata*	Lamb Tongue			*
Plantaginaceae	*Veronica anagallis-aquatica*	Blue Water Speedwell			*
Poaceae	*Avena spp.*	Oats			*
Poaceae	*Bromus sp.*				*
Poaceae	*Erogrostis curvula*	African Love Grass			*
Poaceae	*Holcus lanatus*	Yorkshire Fog			*
Poaceae	*Lolium perenne*	Perennial Ryegrass			*
Poaceae	*Nassella trichotoma*	Serrated Tussock			*
Poaceae	*Phalaris aquatica*	Phalaris			*
Poaceae	*Themeda triandra*				
Poaceae	*Vulpia spp.*	Rat's-tail Fescue			*
Polygonaceae	*Acetosella vulgaris*	Sheep Sorrel			*
Polygonaceae	*Rumex crispus*	Curly Dock			*
Ranunculaceae	*Ranunculus inundatus*	River Buttercup			

Family	Species	Common Name	BC Act	EPBC Act	Exotic
Ranunculaceae	*Ranunculus repens*	Creeping Buttercup			*
Rosaceae	*Cotoneaster sp.*	Cotoneaster			*
Rosaceae	*Crataegus monogyna*	Hawthorn			*
Rosaceae	*Rosa rubiginosa*	Sweet Briar			*
Rosaceae	*Rubus fruticosus sp. agg.*	Blackberry			*
Solanaceae	*Lycium ferocissimum*	African Boxthorn			*
Typhaceae	*Typha domingensis*	Cumbungi			

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Aboriginal Cultural Heritage Due Diligence Assessment

18 Boureong Drive, Gunning

Report Prepared for Laterals Planning

29th January 2023

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Document Control

Revision	Date	Author	Reviewed
D1	29/01/2023	N. Cracknell	L. O'Brien

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Restricted Information

Information contained within this report is culturally sensitive and should not be made publicly available. The information that is restricted includes (but is not limited to):

- Maps, Mapping Grid Reference Co-ordinates or images for Aboriginal heritage sites, places and objects.
- Location or detailed information regarding places of Aboriginal cultural significance, as expressed or directed by Representative Aboriginal Organisations, Aboriginal elders, or members of the wider Aboriginal community.
- Other culturally appropriate restricted information as advised by Aboriginal representatives and traditional knowledge holders.

Information in the report covered by the above categories should be redacted before being made available to the general public. This information should only be made available to those persons with a just and reasonable need for access.

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CONTENTS

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EXECUTIVE SUMMARY

This report provides Aboriginal heritage due diligence advice for the proposed development of an area of 10.85ha comprised of Lot 4 DP1198749 in Gunning for residential housing. The land parcel is currently used as rural pastoral lots, located on 18 Boureong Drive, Gunning within the Upper Lachlan Shire. The property has been moderately impacted by the construction of the current dwelling, sheds, a large water tank, and ongoing use of the property. The study area is shown on Figure 1 in a regional context, in detail in Figure 2, with the proposed subdivision in Figure 2a.

This Due Diligence heritage assessment has been undertaken in accordance with the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW* (DECCW 2010a).

The proposal would involve the following impacts:

- Construction of building envelopes within the new housing lots.
- Construction of housing foundations involving removal of top and subsoils within Building envelopes
- Connection to infrastructure, such as water, communications and electricity
- Installation of boundary fencing and potential impacts from landscaping

No heritage sites were identified within the project area based on a review of previous reports and field survey of the project area.

Field survey was undertaken across the project area in accordance with the *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW* (DECCW 2010b). The field survey covered the entire block. Ground visibility was low at the time of field survey, with areas of exposed soils uncommon throughout.

As a result of the field survey and background research completed for the project, the following recommendations have been developed:

- The development proposal should be able to proceed with no additional archaeological investigations. No areas of potential archaeological deposits or heritage sites have been identified within the development area and the potential for Aboriginal heritage objects within the development area has been assessed as low.
- All Aboriginal objects are protected under the *NSW National Parks and Wildlife Act 1974*. It is an offence to disturb an Aboriginal site without a consent permit issued by NSW Heritage. Should any Aboriginal objects be encountered during works then works must cease and the find should not be moved until assessed by a qualified archaeologist.
- Further archaeological assessment would be required if the proposal activity extends beyond the area of the current investigation.

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1 INTRODUCTION

This report provides Aboriginal heritage due diligence advice for the proposed development of an area of 10.85ha comprised of Lot 4 DP1198749 in Gunning for residential housing. The land parcel is currently used as rural pastoral lots, located on 18 Boureong Drive, Gunning within the Upper Lachlan Shire. The property has been moderately impacted by the construction of the current dwelling, sheds, a large water tank, and ongoing use of the property. The study area is shown on Figure 1 in a regional context, in detail in Figure 2 and the proposed subdivision in Figure 2a.

This Due Diligence heritage assessment has been undertaken in accordance with the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW* (DECCW 2010a).

The proposal would involve the following impacts:

- Construction of building envelopes within the new housing lots.
- Construction of housing foundations involving removal of top and subsoils within building envelopes
- Connection to infrastructure, such as water, communications and electricity
- Installation of boundary fencing and potential impacts from landscaping

These works are high impact and would have a negative impact on any heritage located within the project boundary. Heritage sites may be located on the surface or subsurface in areas of high potential for the preservation of archaeological remains of historical events or past usage by Aboriginal groups.

To assess the potential impacts of the proposed works on heritage this Due Diligence Heritage Assessment has been undertaken.

This report, field survey and associated research has been conducted in accordance to the requirements of the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* (OEH 2010.

1.1 PROJECT OBJECTIVES

The due diligence assessment is being undertaken to complete the following objectives:

1. Review of the NSW Heritage Aboriginal Heritage Information Management System (AHIMS), to identify any recorded heritage sites within the project area.
2. Review of historic registers to identify any historic heritage.
3. Review of previous reports in area to develop predictive model of site location
4. Assess landforms present in project area against predictive model to determine potential for heritage sites and determine level of disturbance

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5. Complete site visit to visually inspect impact areas or areas assessed as holding potential based on predictive model and record any identified heritage sites. The site visit will also document levels of disturbance within project area.
6. Complete due diligence report with management recommendations to avoid or minimise impacts within the project area.

1.2 ABORIGINAL CONSULTATION

Consultation with the Pejar Local Aboriginal Land Council was undertaken for the Due Diligence Assessment, with a representative participating in the field survey. The project was explained to the representative and following the field survey the proposed recommendations. No objections were raised to the report findings.

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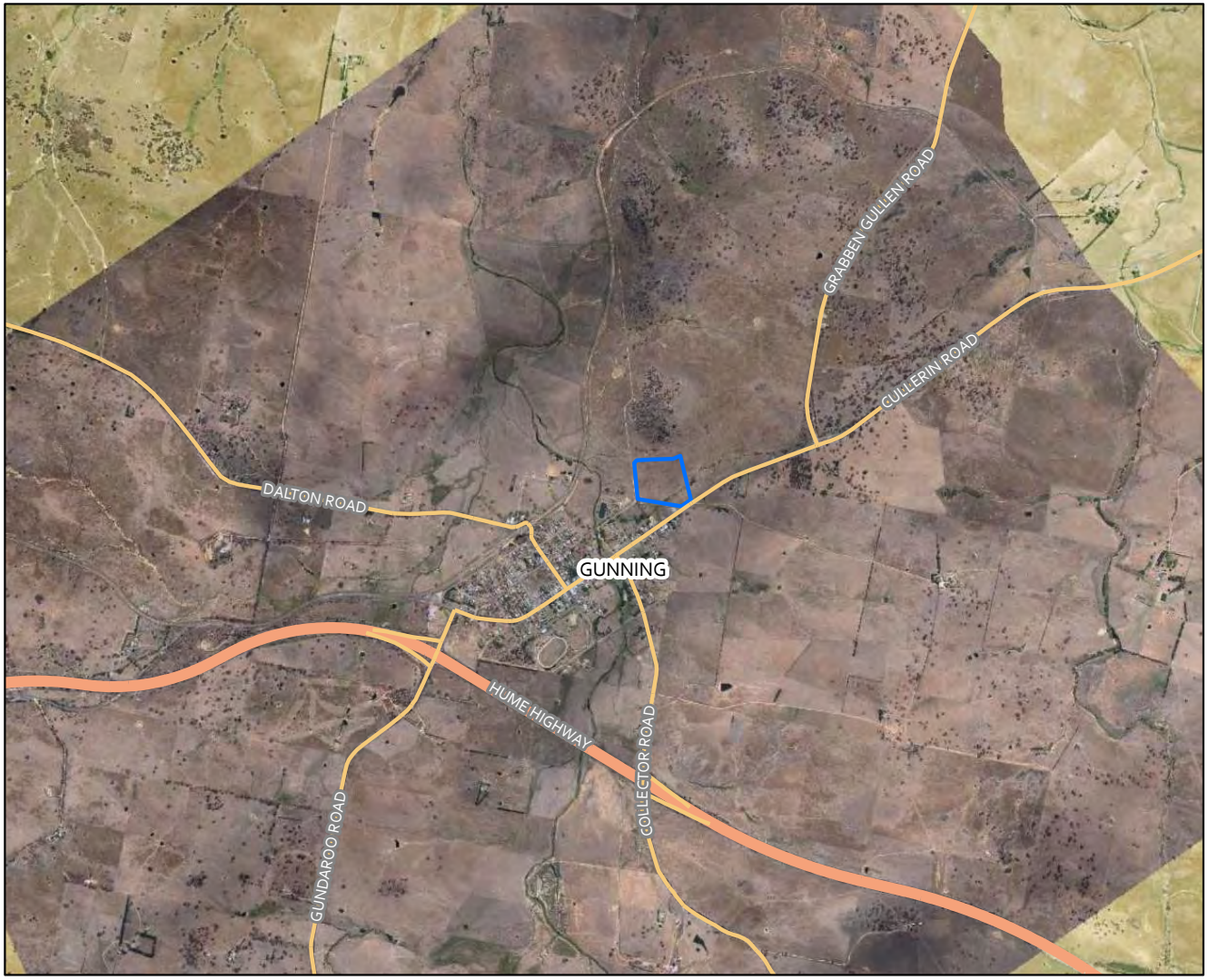

Figure 1: Regional Context

Legend

- Highway
- Major Road
- Project Area

N

1:40,000

0 0.5 1 2

Kilometers
Coordinate System:
GDA 1994 MGA Zone 55

Imagery: © NSW Spatial Services

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Figure 2: Study Area

Legend

- Contour -10m
- Watercourse
- Major Road
- Minor Road
- Track-Vehicular
- Project Area
- Cadastre

N

1:2,500

0 25 50 100

Meters
Coordinate System:
GDA 1994 MGA Zone 55

Imagery: © NSW Spatial Services

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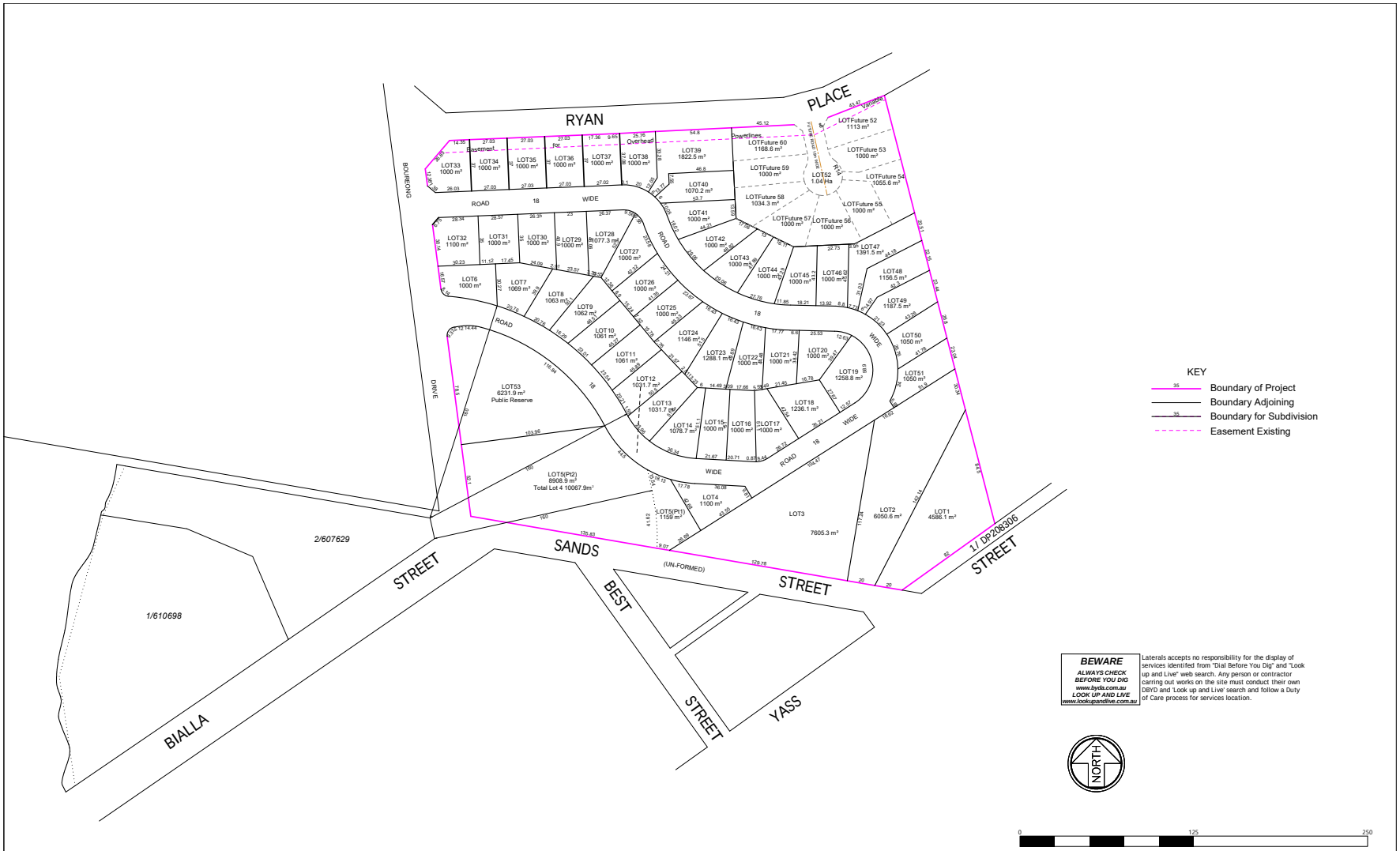

			Surveyed : Southern Cross Consulting Surveyors	SCALE	LATERALS ENGINEERING & MANAGEMENT LATERALS PLANNING	Sheet Subject	UPPER LACHLAN SHIRE COUNCIL
			Designed : R Mowle	1:1250 on A1		CONCEPT SUBDIVISION	LOT 4 DP 1198749
D	Amended Subdivision Design	12/1/2024	Drawn : K Allen				18 BOUREONG DRIVE, GUNNING
C	Stream Detail and Lot reduction	25/1/2023	Checked : R Mowle	Sheet No. 1 / No. of Sheets 3 / Sheet size A1	1st Floor, 213 Auburn Street Goulburn NSW 2580 Ph: 4821 0973 Fax: 482 0777 48 Johns River Road, Johns River NSW 2443 Mobile 0427 210 973	Figure 2A.	PLANNING PROPOSAL
B	Amended Design for STP	8/6/2022	Datum : AHD				
A	Original	1/7/2021	Laterals Ref : 20022				
Issue	Amendment	Date					

2 DESKTOP ASSESSMENT RESULTS

2.1 ABORIGINAL HERITAGE INFORMATION MANAGEMENT SYSTEM (AHIMS) SEARCH

A search of the NSW Heritage Aboriginal Heritage Information Management System (AHIMS) database was undertaken on the 18 January 2024 covering the 5km surrounding area centred on the project area with the map extents covering Lat, Long from -34.8096, 149.2144 to -34.7391, 149.338. The extensive search revealed no previously recorded heritage sites within the project area and two sites within the wider search area, located 1km west. The locations of the recorded sites in relation to the project area is shown in Figure 3.

Within the Gunning region there have been very few heritage assessments undertaken, with the closest registered Aboriginal Heritage site approximately 1km from the project area. In the wider Upper Lachlan area several studies have been undertaken (Koettig and Silcox 1983, 1985 & 1987, Fuller 1989 and Austral Archaeology 2005) which have resulted in the identification of a number of Aboriginal sites, mainly consisting of artefact scatters or isolated finds. These studies have resulted in a site location model being developed for the region. This model predicts the majority of sites will consist of small artefact sites located on level ground or terrace features in proximity to water sources, with larger sites with subsurface deposits being present in proximity to water features such as a creek confluence or major water sources. This is directly applicable to the project area. This predictive model is discussed in more detail in Section 2.4

2.2 HISTORICAL HERITAGE SEARCH

Within NSW Local government is responsible for managing heritage items. This responsibility is mainly fulfilled by listing heritage items in the Local Environmental Plans (LEPs) under the *Environmental Planning & Assessment Act 1979*. Council approval is required to impact any listed item.

Heritage items can also be of 'state significance' in which case they are listed on the NSW Heritage Register by the NSW Heritage Council under the *Heritage Act 1977*. These items are usually substantial and consist of buildings, bridges or other structures that represent events in the local area.

A search of the NSW Heritage Register and the Upper Lachlan LEP 2010 was undertaken for the project. No historical items are located in the project area or in the vicinity of works. A review of historical parish maps was also undertaken with no known structures or items identified within the project area.

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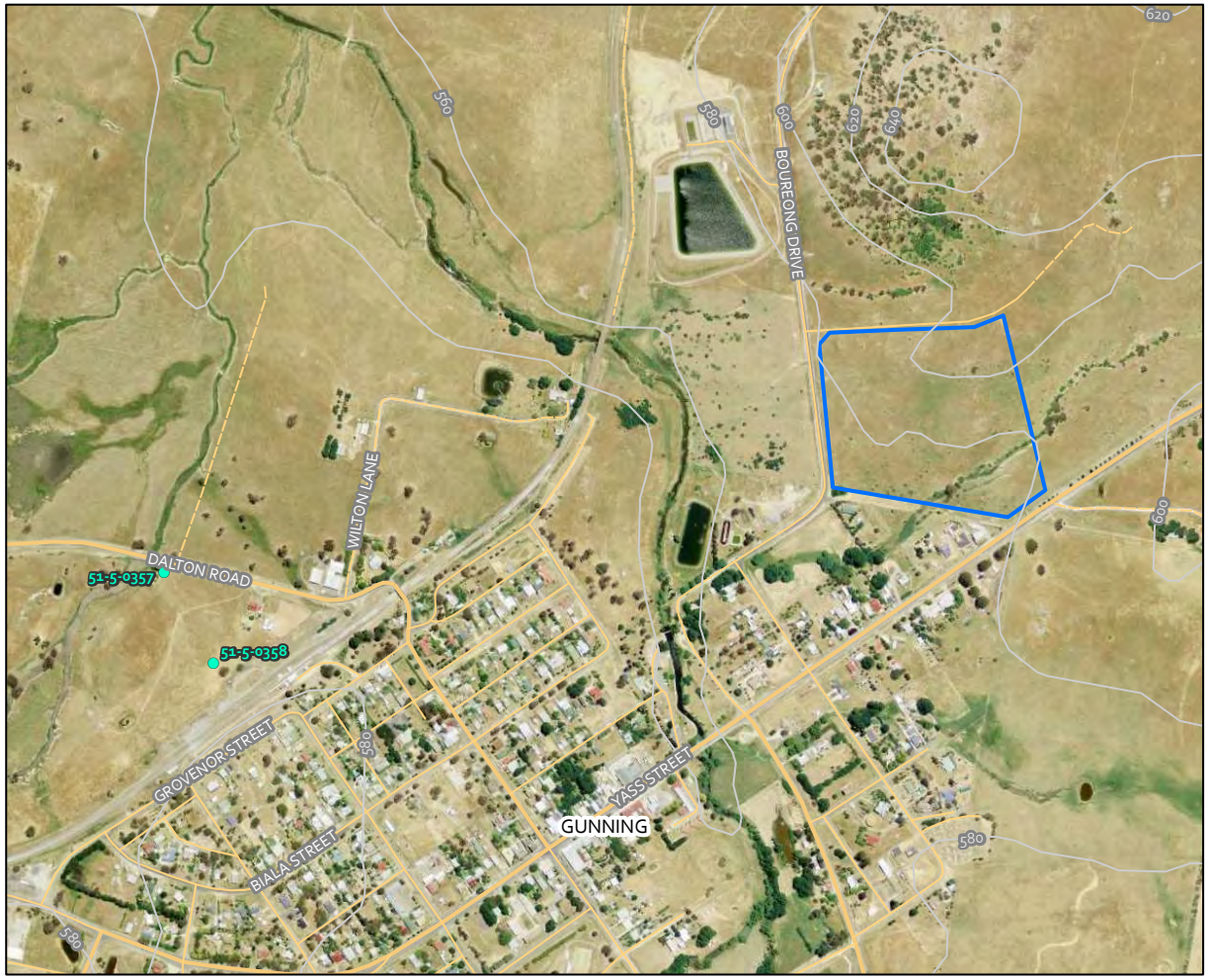

Figure 3: Previously Recorded Sites

Legend

- AHIMS Site
- Contour -10m
- Project Area
- Major Road
- Minor Road
- Track-Vehicular
- Footprint

N

1:10,000

0 100 200 400

Meters
Coordinate System:
GDA 1994 MGA Zone 55

Imagery: © NSW Spatial Services

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2.3 ABORIGINAL GROUPS WITHIN THE PROJECT AREAS

The major language group identified in the Upper Lachlan region by Norman Tindale (1974) in his seminal work on Aboriginal tribal boundaries is that of the Ngunnawal people. The boundaries of the Ngunnawal ran to the southeast where they met the Ngarigo at the Molonglo and the Wiradjuri to the west of the Yass region. The boundary with the Gundungurra (Gandangara) people lies to the north of Goulburn, and the Lake George Blacks or Molonglo tribe to the south (Tindale 1974). This distribution with minor amendments is still accepted and the review of tribal boundaries undertaken in the 1990s (Horton 1996) confirmed these earlier boundary locations.

The traditional clothing of the Aboriginal people in the region was described as consisting of long possum cloaks, worn with the fur turned in for warmth and the tanned skins on the outside for waterproofing, and string belts made from possum or kangaroo hair (Govett 1977:8, Bennett 1967:175, Boswell 1890:9). Boswell described in detail the process of making possum cloaks (Boswell 1890:9). Boswell records that glass was now being used by the Aboriginal community in the making of the possum cloaks and was replacing traditional materials.

The ceremonial dress used was also described by Bennett with head dresses of kangaroo incisors and possum tails, head bands and necklaces. The use of white and red ochre to decorate the upper body and face for ceremonies was noted (Bennett 1967:323-326).

The men travelled with spears, (Govett 1977:36,) some of which were used for hunting while others were for fighting. Woomerahs (spear throwers) were approximately 1m long with a flat handle and a hook at the end (Govett 1977: 11, 36). Hatchets or axes had a ground stone head fastened to a wooden shaft by fibre binding. Govett notes that like the use of glass, iron axes were replacing stone ground axeheads and were greatly valued by the Aboriginal community (Govett 1977:11).

The women travelled with items that showed their main focus on gathering. Women constructed nets from plant fibres which were used to carry items slung over the body – this could also include babies and infants. Govett recalls this practise of 'slinging' babies behind a mothers shoulders (1977:8). Digging sticks consisting of hard wood approximately 1.5m long, burnt at one end to create a hardened point were carried by the women. The process of foraging was continued whilst on the move with food stored in the expanding nets until a camping site was reached (Govett 1977:23).

This traditional clothing was replaced by the blankets distributed by the Government and a mixture of European clothing. Governor Macquarie began a policy of distributing blankets to Aboriginal people in 1814 and groups became increasingly dependent as their traditional resources were destroyed by the impact of pastoralism and their groups suffered cultural impacts from disease, alcohol and displacement.

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2.4 PREVIOUS HERITAGE STUDIES

The proposed residential subdivision is located in Gunning, in the Upper Lachlan within the Southern Tablelands. Regional models of aboriginal landscape and resource use, along with models of intensity of utilization and number of Aboriginal occupants have been developed for the Goulburn and Yass regions, however, there have been very few heritage studies undertaken in the Gunning area, and fewer still within proximity of the Project area.

In 1985, Dallas analysed the known archaeology surrounding Breadalbane and Gunning, hypothesising that Aboriginal people favoured valley bottoms and gentle slopes for open camp sites with most sites recorded within 100m of a water source.

Koettig and Silcox (1983, 1985 and 1987) completed a series of surveys in regards to the proposed Yass Bypass and options. They developed a site locational model for the Southern Tablelands and identified a number of heritage sites, mainly consisting of small artefact scatters or isolated finds located on gentle, well-drained lower slopes for approximately 48% of sites. Ridge tops and flat hill crests constituted 24% of sites, with the rest located on creek flats (19%) and terraces (9%).

Fuller in 1989 was engaged by Goulburn City Council to test Lance and Koettig's 1986 model by undertaking sub surface testing at areas designated high sensitivity by the model. The results of this large excavation program, although supporting the overall model, concluded that all areas apart from major watercourses were of low potential and that further subdivisions were necessary in the undulating hills category if it was to be useful for predicting site locations.

Cultural Heritage Management in 2003 conducted a cultural heritage assessment for the proposed site of the Gunning Wind Farm along Goulburn Road, approximately 12km north-east of Gunning. This assessment identified ten Aboriginal sites (GWF1-GWF10) consisting of three isolated finds and seven artefact scatters. Six areas of PAD were also identified, with GWF PAD1 and GWF PAD2 not associated with the surface finds.

In 2005, Austral Archaeology conducted the test excavations for the proposed site of the Gunning Wind Farm. These six areas of PAD were previously identified in 2003 by Jo McDonald (CHM). The first phase of the test excavation programme involved a series of excavator/grader scrapes with a smooth-edged bucket to remove the topsoil and expose artefacts *in situ.* Where these scrapes exposed artefacts, the Phase 2 would commence with the manual excavation of test pits in transects would commence. No artefacts were identified in any of the 15 excavator scrapes, likely due to the higher elevation and shallow nature of the soils (<15cm depth). The report concluded that GWF PAD1 and GWF PAD2 were not heritage sites, and the four artefact scatters did not feature any subsurface deposits.

Past Traces in 2023 conducted a due diligence assessment of 35 Dalton Road, Gunning, approximately 1km west of the current project. This assessment identified an isolated quartz flake (PTDRG1) in a constructed drainage contour, as well as an area of PAD (PTDRG PAD1) located on a gentle mid slope spur crest overlooking the adjacent 2nd order creek. The PAD is approximately 180m from the creek

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with the PAD extending over an area of 60m x 45m. This PAD has been assessed as having a moderate potential for subsurface deposits and while subsurface testing was recommended, it has not been conducted as of this report.

2.4.1 Predictive Model

Following on from Koettig and Silcox (1983, 1985 & 1987), Fuller (1989) and Austral Archaeology (2005) the following predictive model has been developed for the project area (Table 3).

This site prediction model is based on:

- Site distribution in relation to landscape features within the project area.
- Consideration of site type and densities likely to be present within the project area.
- Potential Aboriginal use of natural resources present or once present within the project area.

Table 1 Site Prediction Model

Probability	Site Type	Definition	Landform
Moderate/Low	Isolated finds and surface scatters of stone artefacts	Stone artefacts ranging from single artefact to high numbers	Creek lines and spur crests. No such features are present within the study area - Creek line in southern portion
Moderate/Low	Potential Archaeological Deposits (PADS)	Area considered on landform to hold higher potential for unidentified subsurface deposits	Varies, but most frequent on elevated terraces along creek lines and spurlines – Creek line in southern portion, no terrace feature present.
Low	Culturally Modified Trees (CMTs)	Trees which have been modified by scarring, marking or branch twining	May be present on old remaining trees – Most old growth trees have been removed
Nil	Rock Engravings	Images engraved on flat rock surfaces	Escarpments, rock platforms or rock shelters - not present
Nil	Stone arrangements	Arrangements of stones by human intention, including circles lines or patterns.	Crest lines or large ceremonial areas on creekflats, - not present
Nil	Stone quarries/Ochre sources	Quarry sites where resources have been mined.	Any landform that has not been disturbed – not present
Nil	Axe grinding grooves	Grooves in stone caused by the grinding of stone axes	Usually in creek lines, as water is used as abrasive with sand - not present

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Probability	Site Type	Definition	Landform
Nil	Burials	Burials of Aboriginal persons	Usually requiring deep sandy soils on eastern facing slopes – not present
Nil	Aboriginal places	A place that hold spiritual, traditional or historical significance to Aboriginal people	Any landform, identified through consultation with RAPs and historical sources

2.5 LANDFORM AND DISTURBANCE LEVEL ASSESSMENT

The landforms within the project area consist of gentle to steep side slopes stemming from the hill crest to the north of the project area. Water sources are present in the form of an unnamed 1st order tributary creek line that feeds into Meadow Creek to the west. This 1st order creek would have in the past been a string of freshwater ponds forming a creek following rains.

The project area has been impacted by European settlement from the mid nineteenth century. The project area has as a result been under continual grazing and pastoral regimes over a lengthy period of time. These past use impacts are typical for Yass and the Upper Lachlan region and consist of the following:

- Vegetation and tree clearance
- Stock impacts
- Fencing
- Vehicle tracks – some consisting of minor roads, other of impact trails
- Extensive impacts in areas of housing including landscaping
- Construction of sheds, outbuildings and yards
- Ploughing of topsoils for pasture improvement or light cropping.

All of these landscape and soil impacts reduce the potential for archaeological or heritage sites to remain intact within the landscape. Confined areas of disturbance are present at gates and along fence lines. Exposed ground is present in areas of stock impact, vehicle tracks, fence lines, under trees and large areas of erosion.

Review of previous Aboriginal sites located in the Upper Lachlan region indicate a site location model based on level areas in proximity to water resources such as creek lines with smaller sites located on hilltop ridgelines. The study area consists of gentle to steep gradient side slopes classified as holding low overall low potential for heritage sites. A gentle midslope spur crest is present in the northeast

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corner of the project area, but has been heavily impacted by the construction of the current dwelling, sheds and outbuildings. The southern section of the property features a 1st order drainage line, the banks and adjacent gentle slopes of which are uniform and area assessed to hold moderate to low potential for unrecorded heritage sites based on predictive modelling. Assessment of the degree of disturbance and presence of any terrace or raised features in these slopes will be an aim of the field survey.

As a result of the landform assessment, considering the uniform nature of the long side slopes, the study area contains low potential to contain any unrecorded heritage sites and has suffered a low to moderate degree of previous impact.

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3 FIELD SURVEY RESULTS

A field survey of the project area was undertaken on the 23rd January 2024 with participation from Pejar LALC to verify the findings of the desktop review of landforms and disturbance. The aim of the investigation was to identify heritage objects or places of potential archaeological Deposit (PAD). Based upon the background research, known Aboriginal site patterning, and current aerial photography, the entire project area was inspected.

All surveyed areas and items of interest were recorded on a topographic map of the study area (using a GPS and GDA94 MGA55 coordinates), along with levels of visibility, erosion, soil conditions, and evidence of land disturbance.

Ground surface visibility (GSV) is the percentage of ground surface that is visible during the field inspection. GSV increases in areas of exposures such as stock impact trails, roads, gates and along areas of erosion such as creek banks and dam walls. As a result, surveys undertaken in areas with high exposure rates result in a more effective survey coverage.

The site visit resulted in the following findings.

3.1.1 Ground Surface Visibility

GSV over most of the study area was low due to the short, but extensive vegetation coverage across the proposed housing lots. Bare earth was visible in infrequent exposures (rate of 30%) and across the project area the average GSV was estimated at 30%. Due to the prevailing vegetation, areas of exposed ground were present under trees, along fence lines, surrounding buildings, landscaped areas, along vehicle access tracks, stock impacts, water course banks and at gate entrances.

Exposures were uncommon at a low frequency across the project areas with areas of bare soils with natural gravels. Rock outcrops were common along the moderate to steep slopes, highlighting relatively shallow soils along the main slope of the property. The conditions at the time of the field survey are shown in plates 1 to 8.

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Plate 1: Northeast corner of project area, comprised of current dwellings and sheds (Facing west)

Plate 2. View from northeast crest overlooking property towards Gunning centre (southwest)

Plate 3: Example of GSV with animal impact trail and rocky outcrops (West)

Plate 4: A scraped borrow pit along western boundary (east)

Plate 5: Animal impact trails along south side of drainage line (Southwest)

Plate 6: First order tributary drainage line along southern boundary (east)

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Plate 7: Large blackberry bushes had been excavated via a tractor (west)

Plate 8: View from 1st order drainage line upslope to current house (Northeast)

3.1.2 Disturbance

The degree of disturbance across the study area was moderate stemming from pastoral impacts, fence lines, current house, sheds and landscaping. The ground is granite covered with a thin clay loam with natural gravels present. The thinness of the soils with large granite outcrops exposed, indicates that no subsurface deposits are present across the majority of the project area.

Stock impacts were present in the form of several single-file animal paths across the property, with heavy stock impacts along the 1st order drainage line with several animal creek crossing points. Large blackberry bushes had been excavated across the property using a tractor, ripping up vegetation and leaving >2m^2 exposures. A mechanically excavated borrow pit was present along the western boundary, and the southern side of the 1st order drainage line featured previous landscaping and earthworks impacts.

The northeast corner of the property features the current dwelling location, with heavy landscaping to flatten the crest, and the addition of two large sheds and a cut-in water tank. Introduced gravels are prevalent in this area, with a previous gravelled driveway stemming from the house to the western fence.

Disturbance across the remainder of the project area is low with disturbance present in the form of prior vegetation and tree removal, stock impacts and fence lines. The majority of the survey area is considered to hold low potential for heritage sites.

Within these areas, the GSV remained low estimated at 30%. Soils were displaced in areas and erosion appears active within the exposures.

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3.1.3 Results - Aboriginal Heritage Sites

No areas of Aboriginal heritage were identified during the field survey despite constant rate of exposures and low vegetation coverage. No known heritage sites will be affected by the proposed development.

3.1.4 Results - Areas of Potential Archaeological Deposit (PAD)

Areas of PAD are defined as landforms that hold higher potential than their surrounds to contain subsurface deposits of past Aboriginal occupation. Based on a review of previous studies completed for the region, areas of PAD would be located in association with waterways (1st or 2nd order streams) on level ground or along spur crest and ridge lines.

As a result of the field survey, no areas of higher potential were noted on the lower slopes which were uniform across the project area. No areas of PAD have been identified and the project area is considered to hold low potential for subsurface deposits.

3.1.5 Results – Historical Heritage

No areas or items of historical heritage were identified within the project area as a result of the background review or field survey.

3.1.6 Summary

As a result of the site visit, field survey of impact areas and background research, it is considered that the project has low potential to impact on unrecorded Aboriginal or Historical heritage sites or areas of PAD. No Aboriginal or historical heritage sites or areas of PAD were recorded or identified as a result of the assessment and no areas of high or moderate sensitivity are present in the development area based on previous research and modelling.

Based on the assessment the impacts from the project are as follows:

- No known Aboriginal objects or places will be impacted by the proposed works.
- No known Historical objects or places are present in the project area.
- No areas of high potential to contain unrecorded Aboriginal or historical objects or places are present in the project area.

The Aboriginal Due Diligence Code provides a flowchart of six questions to identify the presence of and potential harm to Aboriginal heritage. These questions and their applicability to the project are shown in Figure 4. The responses to these questions determine if further heritage investigations are required.

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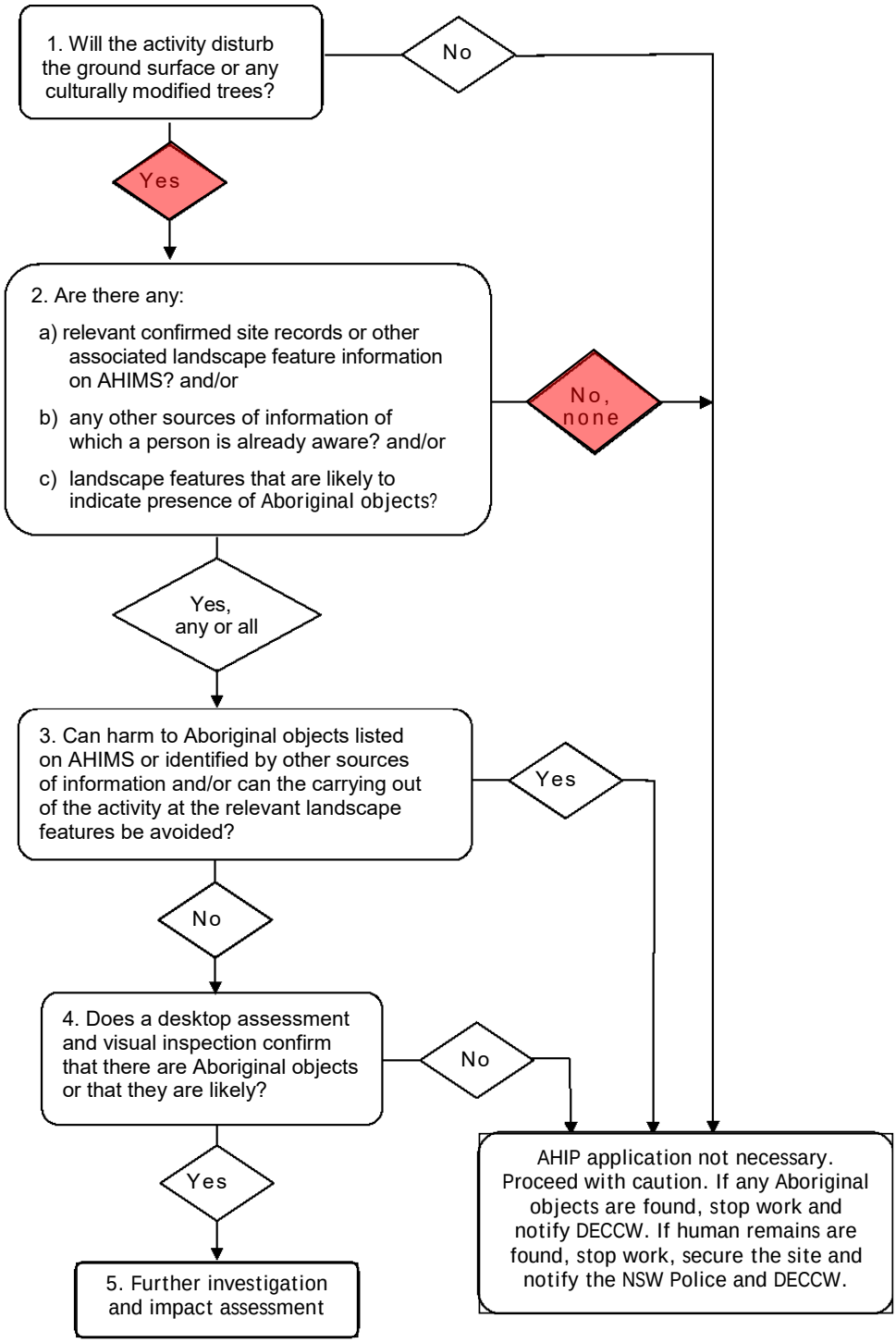
Figure 4. Due Diligence Flow Diagram (OEH 2010:10 – Due Diligence Code of Practice)



3.2 RECOMMENDATIONS

Based on this due diligence assessment the following actions are recommended for the project.

Recommendation 1: Works to proceed without further heritage assessment with caution.

The proposed works can proceed without further assessment as no Aboriginal or historical heritage sites (objects or places) have been identified within the project area. The potential for impacting on unrecorded heritage sites within the project area is assessed as extremely low, based on landform analysis and field survey.

Recommendation 2: Discovery of Unidentified Aboriginal cultural material during works.

Under the *NPW Act 1977* all Aboriginal places and objects are protected from harm, even if they have not been previously identified during the assessment process. If Aboriginal material is discovered during works then the steps as outlined below should be followed:

- All work must cease in the vicinity of the find and project manager notified immediately.
- A buffer zone of 10m should be fenced in all direction of the find and construction personnel made aware of the 'no go' zone.
- NSW Heritage must be notified of the find and advice sought on the proper steps to be undertaken.
- After confirmation from NSW Heritage a heritage consultation should be engaged to undertake assessment of the find and provide appropriate management recommendations to the proponent.

Recommendation 3: Alteration of impact footprint

Further archaeological assessment would be required if the proposal activity extends beyond the area of the current investigation.

Implementation of the above management recommendations will result in low potential for the project to impact on heritage values or result in damage to heritage sites.

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4 REFERENCES

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A.1 APPENDIX 1 – AHIMS SITE SEARCH

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AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : Gunning 2

Client Service ID : 855688

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
51-5-0358	PTDRG1 PAD1	GDA	55	706786	6149074	Open site	Valid	Potential Archaeological Deposit (PAD) : -		
	Contact	**Recorders**	Past Traces Pty Ltd,Mr.Nathaniel Cracknell					**Permits**		
51-5-0357	PTDRG1	GDA	55	706699	6149235	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Past Traces Pty Ltd,Mr.Nathaniel Cracknell					**Permits**		

**** Site Status**

Valid - The site has been recorded and accepted onto the system as valid

Destroyed - The site has been completely impacted or harmed usually as consequence of permit activity but sometimes also after natural events. There is nothing left of the site on the ground but proponents should proceed with caution.

Partially Destroyed - The site has been only partially impacted or harmed usually as consequence of permit activity but sometimes also after natural events. There might be parts or sections of the original site still present on the ground

Not a site - The site has been originally entered and accepted onto AHIMS as a valid site but after further investigations it was decided it is NOT an aboriginal site. Impact of this type of site does not require permit but Heritage NSW should be notified

Report generated by AHIMS Web Service on 18/01/2024 for Nathaniel Cracknell for the following area at Lat, Long From : -34.8096, 149.2144 - Lat, Long To : -34.7391, 149.338. Number of Aboriginal sites and Aboriginal objects found is 2

SLR

Gunning Lot 4 DP 1198749 Rezoning

Odour Impact Assessment

Laterals Engineering and Management Pty Ltd

Prepared by:

SLR Consulting Australia

Level 16, 175 Eagle Street, Brisbane, QLD, Australia, 4000

SLR Project No.: 640.031451.00001

7 November 2024

Revision: 1.0

Making Sustainability Happen

Revision Record

Revision	Date	Prepared By	Checked By	Authorised By
01	7 November 2024	H Shahariar	F Rahaman	J Shepherd

Basis of Report

This report has been prepared by SLR Consulting Australia (SLR) with all reasonable skill, care and diligence, and taking account of the timescale and resources allocated to it by agreement with Laterals Engineering and Management Pty Ltd (the Client). Information reported herein is based on the interpretation of data collected, which has been accepted in good faith as being accurate and valid.

This report is for the exclusive use of the Client. No warranties or guarantees are expressed or should be inferred by any third parties. This report may not be relied upon by other parties without written consent from SLR.

SLR disclaims any responsibility to the Client and others in respect of any matters outside the agreed scope of the work.

Executive Summary

SLR Consulting Australia Pty Ltd was engaged by Laterals Engineering and Management Pty Ltd (Laterals) to prepare an Odour Impact Assessment (OIA) report in response to an information request by NSW EPA for Gunning Lot 4 DP1198749 (the Site). The information request related to potential odour impacts from the nearby Gunning Sewerage Treatment Plant (GSTP). This OIA was commissioned to assess whether any constraints are posed by the GSTP on the proposed residential use of the Site.

The OIA has been performed in accordance with the NSW EPA document "*Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales*".

The GSTP is relatively small with a design of 1,000 persons equivalent capacity. For comparison, Schedule 3 of the Environment Planning and Assessment considers a sewerage system or works a Designated Development (requiring an environmental impact statement) if it has an intended processing capacity of more than 750 kL per day (or 2,500 persons equivalent capacity), more than double the capacity of the GSTP. SLR understands that it is unlikely that the existing GSTP will be upgraded to increase its capacity in its current location.

Odour emission sampling of the existing GSTP operation to inform the OIA was performed by SLR on 15 October 2024. These odour emissions were modelled using the plume dispersion model CALPUFF.

The predicted 99th percentile odour concentrations associated with the existing operation of the GSTP are well below the conservatively adopted criterion of 2 odour units at all locations of the Site and therefore SLR considers odour emissions from the GSTP to pose no constraint on the proposed development of the Site.

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Tables

Figures

Appendices

1.0 Introduction

SLR Consulting Australia Pty Ltd (SLR) was engaged by Laterals Engineering and Management Pty Ltd (Laterals) to prepare an Odour Impact Assessment (OIA) report in response to the information request by NSW EPA (Gunning Heights Estate - PP-2024-121) dated 23 May 2024 for Gunning Lot 4 DP1198749 (the Site). The information request related to potential odour impacts from the nearby Gunning Sewerage Treatment Plant (GSTP). This OIA was commissioned to assess whether any constraints are posed by the GSTP on the proposed residential use of the Site.

This OIA has been performed in accordance with the NSW EPA document "*Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales*" (NSW EPA 2022), hereafter referred to as the Approved Methods. This report also refers to the NSW Department Office of Environment and Heritage (OEH) 2006 document "*Technical Framework: Assessment and management of odour from stationary sources in NSW"* (NSW DEC 2006a), herein the Odour Framework and the "*Technical Notes: Assessment and management of odour from stationary sources in NSW"* (NSW DEC 2006b), herein the Technical Notes.

In addition to the above, this report also has regard to the draft "*NSW Best Practice Odour Guideline - Sewerage systems including sewage treatment plants, water recycling facilities, sewage reticulation systems and sewer mining"* (DoP NSW 2010), herein the Odour Guideline.

The assessment methodology included the modelling of local meteorology and the dispersion of potential odour emissions from the GSTP to predict the level of odour impact that may be experienced at the Site. The sections of this report where the requirements of the Approved Methods are met are as follows:

- description of local topographic features and sensitive receptor locations (**Section 2.2**)
- description of existing air quality environment (**Section 2.3**)
- establishment of air quality assessment criteria (**Section 3.4.2**)
- analysis of climate and dispersion meteorology for the region (**Sections 4.0** and **6.2**)
- compilation of an emissions inventory for the existing activities (**Section 5.2**)
- completion of atmospheric dispersion modelling and analysis of results (**Sections 6.0** and **7.0**).

2.0 Project Description and Site Details

2.1 Site Location and Surroundings

Gunning is a small town on the Old Hume Highway, between Goulburn and Yass in the Southern Tablelands of New South Wales, Australia, about 260 km southwest of Sydney and 75 km north of Canberra. At the 2016 census, Gunning had a population of 659.

The Site is approximately 10 hectares in size and is located immediately northeast of existing Gunning residential areas. It is approximately 150 m east of the GSTP.

The location of the Site relative to the GSTP and the nearest existing Gunning residential areas is presented in **Figure 1**.

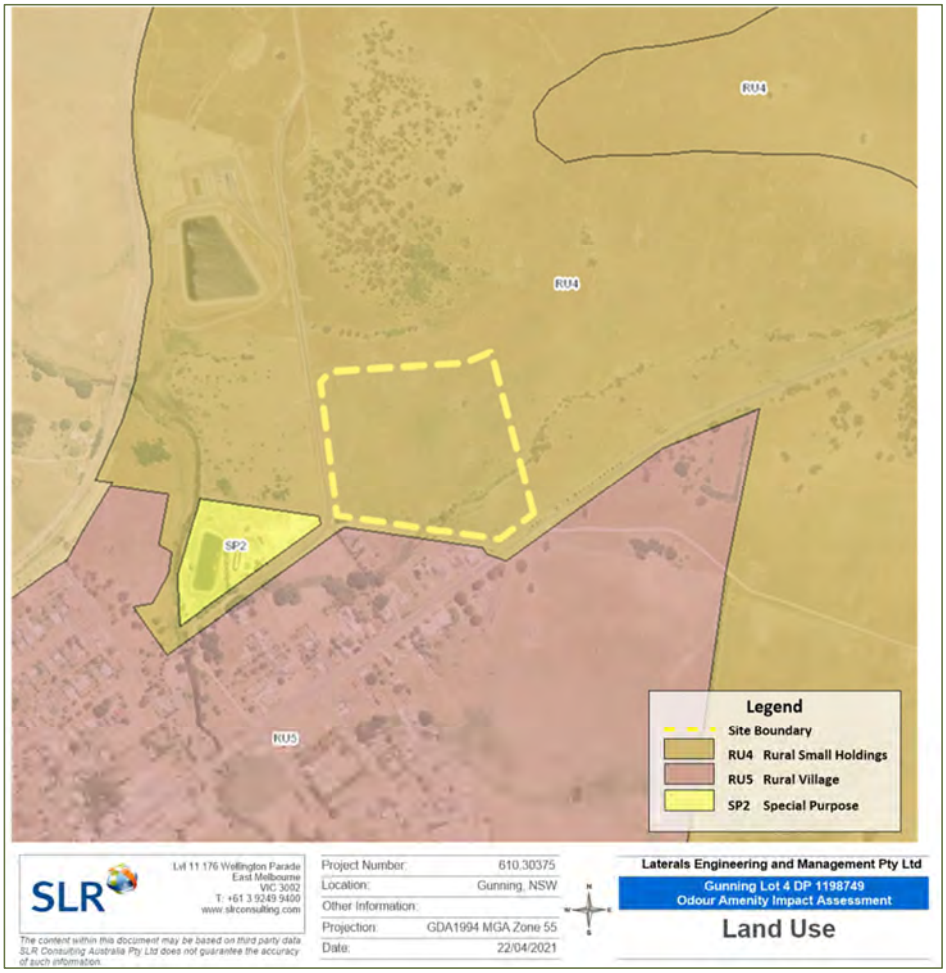
The Site is zoned as RU4 Rural Small Holdings (see **Figure 2**). It is bordered by RU4 and RU5 Village to the southwest (existing residences of Gunning). It is proposed to rezone the Site to RU5, the objective of which is:

> *'to provide for a range of land uses, services and facilities that are associated with a rural village. To promote development in existing towns and villages in a manner that is compatible with their urban function. To encourage well-serviced sustainable development.'*

It is proposed to develop the Site with residential lots.

Figure 1 Location of the Site

Figure 2 Land Use Zoning

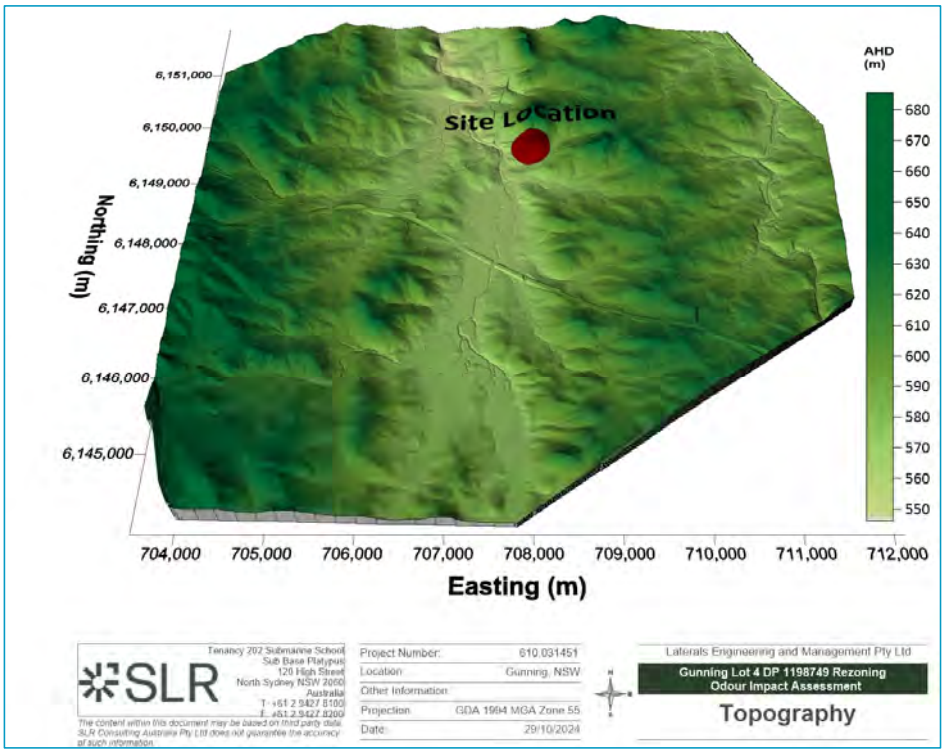


2.2 Surrounding Topography

Topography is important in air quality studies as local atmospheric dispersion can be influenced by night-time katabatic (downhill) drainage flows from elevated terrain or channelling effects in valleys or gullies.

A three-dimensional representation of the topography surrounding the Site is presented in **Figure 3**. The ground elevation within the area illustrated in **Figure 3** ranges from approximately 550 m to 680 m Australian Height Datum (AHD). There are a number of significant topographical features in the surrounding area that are expected to influence local wind patterns and affect the dispersion of odour emissions from the GSTP. This has been taken into consideration in the selection of the model and modelling grid resolution used for the study.

Figure 3 Local Topography Surrounding the Site



Note: Vertical exaggeration applied

2.3 Existing Odour Environment

2.3.1 GSTP

Gunning residential area is serviced by approximately 9 km of sewer mains and one major pump station (collects all flows from reticulation) transferring sewage to the GSTP. The GSTP is relatively small, described in the GSTP Pollution Incident Response Management Plan (Upper Lachlan Shire Council, undated) as treating approximately 100 kilolitres (kL) of sewage daily in dry weather, potentially reaching 250 kL per day during heavy rain periods. SLR understands that the GSTP has a design of 1,000 persons equivalent capacity. For comparison, Schedule 3 of the Environment Planning and Assessment (NSW Government 2000) considers a sewerage system or works a Designated Development (requiring an environmental impact statement) if it has an intended processing capacity of more than 750 kL per day (or 2,500 persons equivalent capacity), more than double the capacity of the GSTP. SLR understands that it is unlikely that the existing GSTP will be upgraded to increase its capacity in its current location.

2.3.2 Potential Odour Emissions and Impacts from the GSTP

Wastewater management processes have the potential to expose sensitive land uses to unacceptable air emissions. The GSTP may generate odour from the wastewater treatment process and sludge handling, potential impacts of which could vary from being just detectable to levels that can cause nuisance and become objectionable and offensive. The main effect of environmental odour is nuisance, but stronger or persistent odours can lead to feelings of nausea, headache, loss of sleep and other symptoms of stress. Repeated exposure to nuisance levels of odour can lead to a high level of annoyance. While some people may become accustomed to odours, others may become sensitised to them.

There is little information publicly available on the design and treatment processes of the GSTP. Upper Lachlan Shire Council were contacted to confirm the operation of the GSTP however, no response was received at the time of reporting.

The main components of the GSTP identified from aerial imagery and site visits are shown in **Figure 4**. The main odour sources are identified as the aeration pond and sludge lagoons. The tertiary pond, which stores treated water prior to discharge, is not expected to be a significant source of odours and has not been considered further.

Given the relatively small scale of the GSTP, the generation of odour from this facility is likely to be low. However, the scale of the odour impact at nearby sensitive receptors (existing and proposed) will further depend on the local dispersion environment and separation distance between odour sources and receptors. The greater the separation, the greater opportunity for the odour to disperse, becoming diluted to below detectable concentrations. As the odour plume will travel and disperse downwind of the source, the wind must travel in the direction of the receptor for the impact to reach the receptor.

Figure 4 Layout of the GSTP

3.0 Air Quality Policy and Guidance

The following air quality policy and guidance documents have been referenced within this assessment and have been used to identify the relevant air quality criteria (see **Section 3.4**).

3.1 Approved Methods for Modelling and Assessment

The Approved Methods list the statutory methods for modelling and assessing air pollutants (including odour) from stationary sources and specify criteria which reflect the environmental outcomes adopted by the EPA.

The odour impact assessment criteria set out in the Approved Methods relevant to the GSTP are reproduced and discussed in **Section 3.4.2**.

3.2 Odour Technical Framework and Notes

The EPA's Technical Framework and Technical Notes publications provide a policy framework for assessing and managing activities that emit odour and offer guidance on dealing with odour issues. These documents are required to be referenced when assessing any odour issue in NSW.

3.3 NSW DoP Best Practice Odour Guideline

The draft Odour Guideline covers sewerage system infrastructure in urban areas including sewage treatment plants (STP), water recycling facilities, sewage reticulation systems and sewer mining. It is noted that the Odour Guideline is a draft document that is not legally enforceable and is not official government policy but provides best practice guidance for managing odour for existing, new and expanding sewage treatment plants.

The following guidance provided in the Odour Guideline is relevant to expanding STPs:

- The odour design criteria to be adopted during the engineering design stage for an expanding STP is the achievement of a 2 odour unit (ou) odour assessment criterion at the boundary of the Industrial Zone or the Rural or Infrastructure (SP2) lot(s).
- Adoption of good operational practices such as an Odour Management Plan (OMP). An OMP would specify odour operational and management standards and practices and set out strategies and measures for minimising the risks of odour incidents and contingency actions for managing odour issues if they occur.
- Adoption of 'good neighbour' procedures and practices and encouraging staff to:
    - communicate and consult with neighbours
    - seek opportunities to explain and interpret management practices
    - provide detailed information about proposed activities or works in progress
    - actively participate in community forums on issues relating to the sewerage system, its management and community values
    - be responsive to neighbour's concerns and professionally conciliate any issues and
    - cooperate with neighbours to resolve concerns.

3.4 Air Quality Criteria

3.4.1 Odour Concentration and Emission Rate Definitions

Odour concentration is measured in terms of odour units (ou). 1 ou is the concentration of odour-containing air that can just be detected by 50% of members of an odour panel (persons chosen as representative of the average population sensitivity to odour). This process is defined within Australian Standard AS4323.3:2001 "*Stationary Source Emissions – Part 3: Determination of Odour Concentration by Dynamic Olfactometry"*.

The specific odour emission rate (SOER) is a measure of odour released from an area source and is expressed in odour units emitted per surface and time unit (ou.m^3/ m^2/s or ou.m^3/ m^2/min).

An odour emission rate (OER) is the product of the odour concentration (ou) and the volumetric flow rate (e.g. m^3/s or m^3/min), and is often annotated as ou.m^3/s, or ou.m^3/min. For area sources, the SOER is multiplied by the area of the source to obtain the OER.

3.4.2 Odour Impact Assessment Criteria

Impacts from odorous air contaminants are often nuisance-related rather than health-related. Odour performance goals guide decisions on odour management but are generally not intended to achieve "no odour".

The detectability of an odour is a sensory property that refers to the theoretical minimum concentration that produces an olfactory response or sensation. This point is called the *odour threshold* and defines 1 ou. An odour goal of less than 1 ou would theoretically result in no odour impact being experienced.

In practice, the character of a particular odour can only be judged by the receiver's reaction to it, and preferably only compared to another odour under similar social and regional conditions. Based on the literature available, the level at which an odour is perceived to be a nuisance can range significantly depending on a combination of the following factors:

Odour quality: whether an odour results from a pure compound or from a mixture of compounds. Pure compounds tend to have a higher threshold (lower offensiveness) than a mixture of compounds.

Population sensitivity: any given population contains individuals with a range of sensitivities to odour. The larger a population, the greater the number of sensitive individuals it may contain.

Background level: whether a given odour source, because of its location, is likely to contribute to a cumulative odour impact. In areas with more closely-located sources, it may be necessary to apply a lower threshold to prevent offensive odour.

Public expectation: whether a given community is tolerant of a particular type of odour and does not find it offensive, even at relatively high concentrations. For example, background agricultural odours may not be considered offensive, particularly in a rural or semi-rural environment, until a higher threshold is reached than for odours from a landfill facility.

Source characteristics: whether the odour is emitted from a stack (point source) or from an area (diffuse source). Generally, the components of point source emissions can be identified and treated more easily than diffuse sources. Emissions from point sources can be more easily controlled using control equipment.

Health effects: whether a particular odour is likely to be associated with adverse health effects. In general, odours from agricultural activities are less likely to present a health risk than emissions from industrial facilities.

Experience gained through odour assessments from proposed and existing facilities in NSW indicates that an odour performance goal of 7 ou is likely to represent the level below which "offensive" odours should not occur (for an individual with a 'standard sensitivity' to odours). The OEH recommends within the Odour Framework that, as a design goal, no individual be exposed to ambient odour levels of greater than 7 ou. This is expressed as the 99th percentile value, as a nose response time average (approximately one second).

Odour performance goals need to be designed to take into account the range of sensitivities to odours within the community and provide additional protection for individuals with a heightened response to odours. In NSW this is done using a statistical approach which depends on the size of the affected population. As the affected population size increases, the number of sensitive individuals is also likely to increase, which suggests that more stringent goals are necessary in these situations. In addition, the potential for cumulative odour impacts in relatively sparsely populated areas can be more easily defined and assessed than in highly populated urban areas. It is often not possible or practical to determine and assess the cumulative odour impacts of all odour sources that may impact a receptor in an urban environment. Therefore, the proposed odour performance goals allow for population density, cumulative impacts, anticipated odour levels during adverse meteorological conditions and community expectations of amenity.

The equation used by the OEH to determine the appropriate impact assessment criteria for complex mixtures of odorous air pollutants, as specified in the Approved Methods, is expressed as follows:

Impact assessment criterion (ou) = $(\log_{10}(\text{population})-4.5)/-0.6$

A summary of the impact assessment criteria given for various population densities, as drawn from the Approved Methods, is given in **Table 1**. This factor has been used to derive a project specific odour criterion.

Table 1 OEH Impact Assessment Criteria for Complex Mixtures of Odorous Air Pollutants

Population of Affected Community	Impact Assessment Criteria (ou; nose-response-time average, 99th percentile)
Urban area (≥ 2000)	2.0
~500	3.0
~125	4.0
~30	5.0
~10	6.0
Single residence (≤ 2)	7.0
Source: The Approved Methods (NSW EPA 2022)	

The Approved Methods state that the impact assessment criteria for complex mixtures of odorous air pollutants must be applied at the nearest existing or likely future off-site sensitive receptor(s).

The incremental impact (predicted impact due to the pollutant source alone) must be reported in units consistent with the impact assessment criteria (ou), as peak concentrations (i.e. approximately 1 second average) and as the:

100th percentile of dispersion model predictions for Level 1 impact assessments; or

99th percentile of dispersion model predictions for Level 2 impact assessments.

It is noted that a Level 2 odour impact assessment as defined by the Approved Methods is equivalent to a Level 3 odour impact assessment as defined by the Technical Framework.

3.4.3 Peak to Mean Ratios

It is a common practice to use dispersion models to determine compliance with odour goals. This introduces a complication because dispersion models are typically restricted by the meteorological data inputs to predicting concentrations over an averaging period of 1-hour or greater. The human nose, however, can respond to odours over periods of the order of one second. During longer periods, odour levels can fluctuate significantly above and below the mean depending on the nature of the source.

To determine the ratio between the 1-second peak concentrations and longer period average concentrations (referred to as the peak to mean ratio) that might be predicted by a dispersion model, the EPA commissioned a study by Katestone Scientific Pty Ltd (Katestone Scientific 1995; 1998). This study recommended peak to mean ratios for a range of circumstances. The findings of these studies have been adopted in the Approved Methods and Technical Framework.

For area sources, the peak to mean ratio is dependent on atmospheric stability and the distance from the source. For this Project, a Peak-to-Mean Ratio (P/M60) of 2.5 for stability classes A, B, C and D and 2.3 for stability classes E and F have been applied.

4.0 Climate and Meteorology

The nearest active Automatic Weather Station (AWS) collecting data suitable for use in a quantitative air dispersion modelling study operated by the Bureau of Meteorology (BoM) is located at Goulburn Airport, approximately 42 km north-east of the current site.

Goulburn Airport AWS (Station 070330, elevation 640 m), has data available for the following parameters:

- temperature (°C)
- rainfall (mm)
- relative humidity (%)
- wind speed (m/s)
- wind direction (degrees).

The details of Goulburn Airport AWS are summarised in **Table 2**.

Table 2 Meteorological Monitoring Station Details

Station Name	Location (m, MGA)		Distance / Direction from GSTP	Elevation (m, AHD)
	Easting	Northing		
Goulburn Airport AWS	749,830	6,144,793	42 km north-east	640

A review of the long-term data collected by this station is provided in the following sections.

4.1 Temperature

Long-term temperature statistics for Goulburn Airport AWS are summarised in **Figure 5**. Mean maximum temperatures range from 11.9°C in winter to 28°C in summer, while mean minimum temperatures range from 0.4°C in winter to around 12.9°C in summer. Maximum temperatures of 42.8°C and minimum temperatures less than -10.9°C have been recorded.

4.2 Rainfall

Long-term rainfall statistics for Goulburn Airport AWS are summarised in **Figure 6.** The average monthly rainfall is relatively high between late spring and early autumn, generally reducing from mid-autumn to mid spring with the lowest average of 30.6 mm/month recorded during April. On average, all months recorded an average of greater than eight days of rain days per month. The highest average monthly rainfall of 64.2 mm/month occurs in November, with an average of 11 rain days recorded in this month. The highest monthly rainfall recorded over the time period examined was 232.4 mm recorded in December 2010.

4.3 Relative Humidity

Long-term humidity statistics (9 am and 3 pm monthly averages) for Goulburn Airport AWS are summarised in **Figure 7**. Morning humidity levels range from an average of around 65% in mid spring to around 88% in early autumn to mid-summer. Afternoon humidity levels are lower, at around 63% in late summer and dropping to a low of 39% in spring.

Figure 5 Long Term Temperature Data

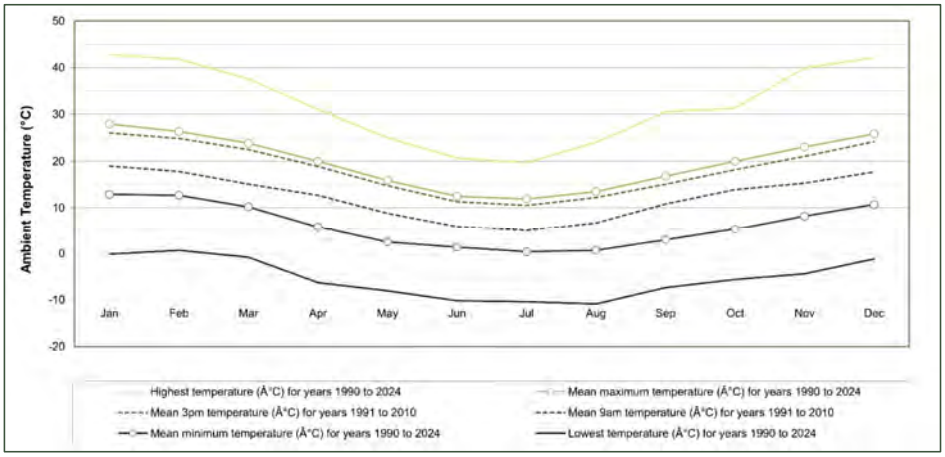


Figure 6 Long Term Monthly Rainfall Data

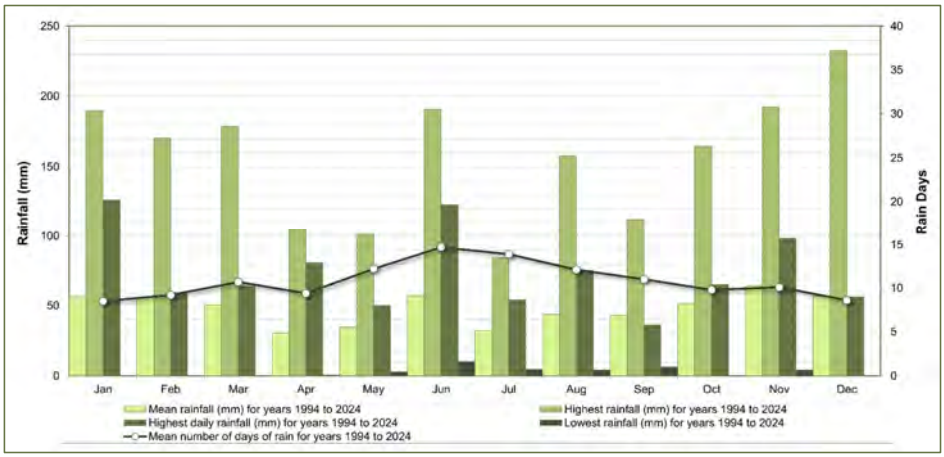
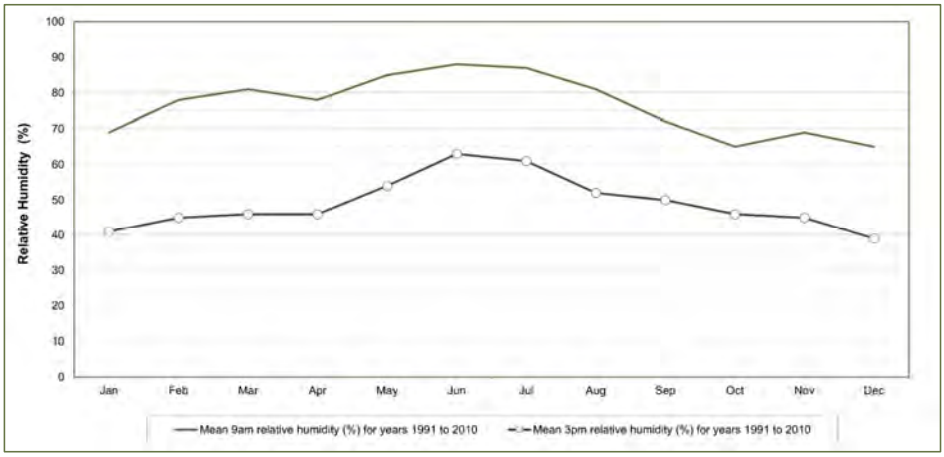


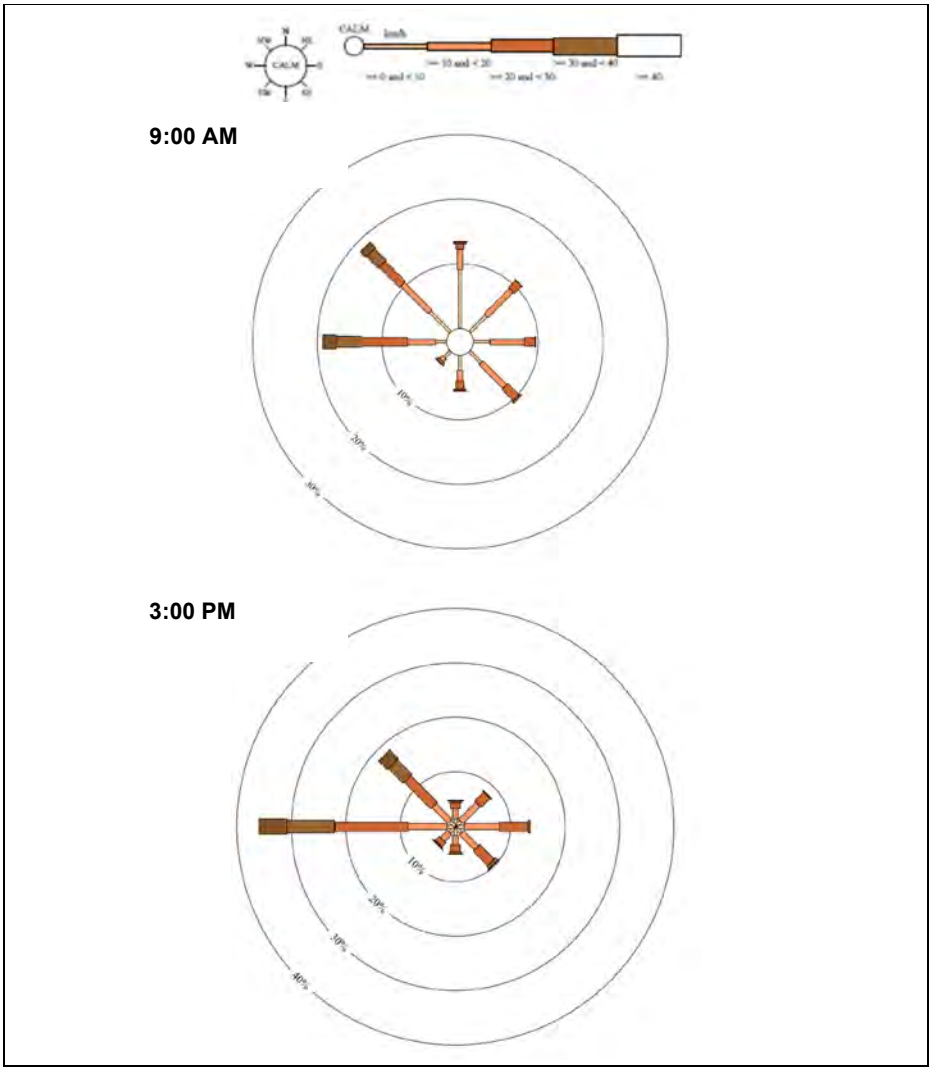
Figure 7 Long Term Humidity Data



4.4 Wind Speed and Direction

Long term wind data (9:00 am and 3:00 pm) for Goulburn Airport are presented as wind roses in **Figure 8**. The wind roses show that winds from west and north-west are predominant in the morning and afternoon periods, with a high frequency of westerly winds also evident in the afternoon.

Figure 8 Rose of Wind Direction Vs Wind Speed for Goulburn Airport AWS (1989 -2024)



5.0 Estimation of Air Emissions

5.1 Potential Odour Sources

The main components of the GSTP identified from aerial imagery and site visits are shown in **Figure 4**. The main odour sources are expected to be the aeration pond and sludge lagoons. The tertiary pond, which stores treated water prior to discharge, is not expected to be a significant source of odour.

5.2 Emission Rates for Dispersion Modelling

Odour emission sampling of the existing GSTP operation was performed by SLR on 15 October 2024. The main sampling points of the GSTP are shown in **Figure 4**. Laboratory analysis of the samples was conducted by The Odour Unit, NATA accreditation No. 14974. The laboratory analysis report is provided in **Appendix A**.

Odour emission rates from on-site sampling measurements were used as input for the CALPUFF dispersion model and are presented in **Table 3**. Odour emission rates presented in **Table 3** shows that Pasveer Channel when operating with aeration would emit significantly high level of odours compared to other onsite odour sources or during post aeriation period of the Pasveer Channel. It is noted that aeration is an intermittent operation and only occurs for short periods of the day. As a conservative approach, odour emissions associated with Pasveer Channel have been modelled as a continuous operations (24/7) operation using the measured highest emission rate of 1.44 ou.m³/s/m². Other emission sources were also modelled using the height values among different samplings.

Conservative odour emission rates established based on measure data and adopted for this study are presented in **Table 4**.

Table 3 Odour Emission Rates Obtained from On-site Sampling

Sample ID	Location Source	Approximate Source Area (m^2)	Odour Concentration (ou)	Surface Odour Emission Rate (SOER) ($ou.m^3/s/m^2$)
15284	Pasveer Channel near inlet pipe Aeration	787	2230	1.44
15285	Pasveer Channel Aeration	787	1450	0.94
15286	Pasveer Channel near inlet pipe Post-Aeration	787	118	0.08
15287	Pasveer Channel Post-Aeration	787	91	0.06
15288	Septic Lagoon	369	108	0.07
15289	Septic Lagoon Replicate	369	118	0.08
15290	Dry Septic Pond	460	99	0.06
15291	Dry Septic Pond Replicate	460	91	0.06
15292	Wet Septic Pond	460	118	0.08
15293	Wet Septic Pond Replicate	460	41	0.03

Table 4 Modelled Odour Emission Rates

Location Source	Surface Odour Emission Rate (SOER) ($ou.m^3/s/m^2$)
Pasveer Channel	1.44
Septic Lagoon	0.08
Dry Septic Pond	0.06
Wet Septic Pond	0.08

6.0 Atmospheric Dispersion Modelling Methodology

6.1 Model Selection

Odour emissions associated with the GSTP operation have been modelled using a combination of the TAPM, CALMET and CALPUFF models. CALPUFF is a transport and dispersion model that ejects “puffs” of material emitted from modelled sources, simulating dispersion and transformation processes along the way. In doing so, it typically uses the fields generated by a meteorological pre-processor CALMET, discussed further below. Temporal and spatial variations in the meteorological fields selected are explicitly incorporated in the resulting distribution of puffs throughout a simulation period. The primary output files from CALPUFF contain either hourly concentration or hourly deposition fluxes evaluated at selected receptor locations. The CALPOST post-processor is then used to process these files, producing tabulations that summarise results of the simulation for user-selected averaging periods.

6.2 Meteorological Modelling

6.2.1 Selection of Representative Year for Meteorological Modelling

In order to determine a representative meteorological year for use in dispersion modelling, five years of meteorological data (2019-2023) from the closest meteorological monitoring station (i.e. Goulburn Airport AWS) were analysed against the five-year average meteorological conditions. Specifically, the following parameters were analysed:

- frequency and distribution of the predominant wind directions
- monthly average wind speeds observed
- monthly average temperatures.

Based on this analysis, it was concluded that the year 2023 was representative of the last five years of meteorological conditions experienced at the GSTP and hence the 2023 calendar year was adopted for use in this assessment. A summary of this analysis is presented in **Appendix B**.

6.2.2 Meteorological Data Availability

To adequately characterise the dispersion meteorology of the GSTP, information is needed on the prevailing wind regime, atmospheric stability, mixing depth and other meteorological parameters. Hourly meteorological data from the Goulburn Airport AWS (refer **Section 4.0**) were incorporated in the meteorological modelling study for the study area.

6.2.3 TAPM

The TAPM prognostic model, developed by the Commonwealth Scientific and Industrial Research Organisation (CSIRO), was used to generate the upper air data required for CALMET modelling.

TAPM predicts wind speed and direction, temperature, pressure, water vapour, cloud, rainwater and turbulence. The program allows the user to generate synthetic observations by referencing databases (covering terrain, vegetation and soil type, sea surface temperature and synoptic scale meteorological analyses) which are subsequently used in the model input to generate one full year of hourly meteorological observations at user-defined levels within the atmosphere.

Additionally, the TAPM model may assimilate actual local wind observations so that they can optionally be included in a model solution. The wind speed and direction observations are used to realign the predicted solution towards the observation values. In this study, data from the BoM's Goulburn Airport AWS has been used to nudge (i.e. influence) the TAPM predictions. **Table 5** details the parameters used in the TAPM meteorological modelling for this assessment.

Table 5 Meteorological Parameters Used for this Study - TAPM

TAPM (v 4.0)	
Number of Grids (spacing)	4 (30 km, 10 km, 3 km and 1 km)
Number of Grid Points	25 x 25 x 35
Year of Analysis	2023
Centre of Analysis	705,390 m E 6,146,800 m S
Data Assimilation	Goulburn Airport AWS

6.2.4 CALMET

In the simplest terms, CALMET is a meteorological model that develops hourly wind and other meteorological fields on a three-dimensional gridded modelling domain that are required as inputs to the CALPUFF dispersion model. Associated two dimensional fields such as mixing height, surface characteristics and dispersion properties are also included in the file produced by CALMET. The interpolated wind field is then modified within the model to account for the influences of topography, sea breeze, as well as differential heating and surface roughness associated with different land uses across the modelling domain. These modifications are applied to the winds at each grid point to develop a final wind field. The final hourly varying wind field thus reflects the influences of local topography and land uses.

The CALMET domain was modelled with a resolution of 50 m. The TAPM-generated 3-dimensional meteorological data (1 km resolution) was used as the 'initial guess' wind field and the local topography and available surface weather observations in the area were used to refine the wind field predetermined by TAPM. **Table 6** details the parameters used in the meteorological modelling to drive the CALMET model.

Table 6 Meteorological Parameters Used for this Study – CALMET (V 6.1)

CALMET Domain	
Meteorological Grid	5 km × 5 km
Meteorological Grid Resolution	50 m
Initial Guess Filed	3D output from TAPM modelling
Topography	SRTM-derived 1 Second data sourced from Geosciences Australia
Surface station data	Goulburn Airport AWS

6.3 Meteorological Data Used in Modelling

To provide a summary of the meteorological conditions predicted at the site using the methodology described in **Section 6.2**, a single-point, ground-level meteorological dataset was 'extracted' from the 3-dimensional dataset at the site and is presented in this section.

6.3.1 Wind Speed and Direction

A summary of the annual wind behaviour predicted by CALMET for 2023 (extracted at the site) is presented as wind roses in **Figure 9** and as a wind speed distribution plot in **Figure 10**. These plots show that winds in the study area were predicted to be predominantly of gentle to moderate strength (between 3 m/s and 8 m/s) during 2023. Calm wind conditions were predicted to occur approximately 3.7% of the time throughout the modelling period. It is noted that the moderate winds and low percentage of calm wind conditions will assist pollutant dispersion, resulting in lower odour concentrations at the surrounding receptors.

The seasonal wind roses indicate that typically:

- In summer, winds predominantly blow from the eastern quadrant with a very low frequency of winds from other quadrants. On average, calm winds are experienced 2.9% of the time during summer.
- In autumn, winds from eastern quadrant are predominant. Winds from the west and northwest are also significant. On average, calm winds are experienced 4.3% of the time during autumn.
- In winter, winds predominantly blow from the northwest quadrant. On average, calm winds are experienced 4.1% of the time during winter.
- In spring, winds from eastern quadrant are predominant. Winds from the west and northwest are also significant. On average, calm winds were experienced 3.4% of the time during spring.

Figure 9 CALMET-Predicted Seasonal Wind Roses for the Site – 2023

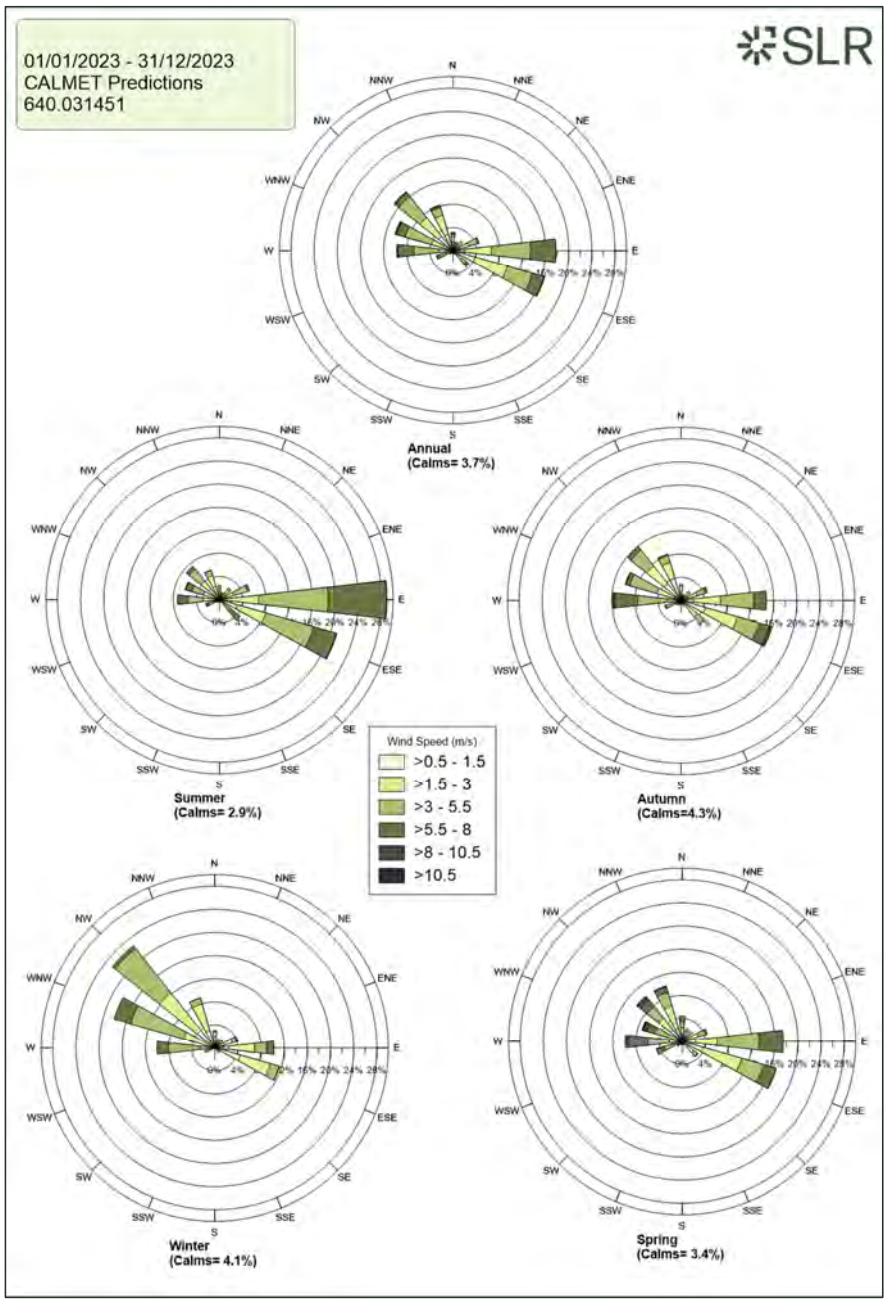
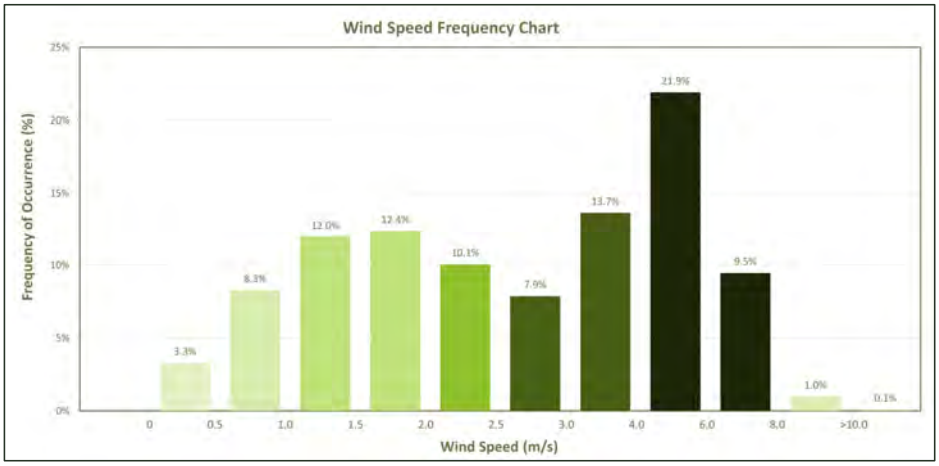


Figure 10 Annual Wind Speed Frequencies at the site (CALMET Predictions, 2023)



1.1.1 Atmospheric Stability

Atmospheric stability refers to the tendency of the atmosphere to resist or enhance vertical motion. The Pasquill-Gifford-Turner (PGT) assignment scheme identifies six stability classes, A to F, to categorise the degree of atmospheric stability as follows:

A = Extremely unstable conditions

B = Moderately unstable conditions

C = Slightly unstable conditions

D = Neutral conditions

E = Slightly stable conditions

F = Moderately stable conditions

The meteorological conditions defining each PGT stability class are shown in **Table 7**.

Table 7 Meteorological Conditions Defining PGT Stability Classes

Surface Wind Speed (m/s)	Daytime Insolation			Night-Time Conditions	
	Strong	Moderate	Slight	Thin overcast or > 4/8 low cloud	<= 4/8 cloudiness
< 2	A	A - B	B	E	F
2 - 3	A - B	B	C	E	F
3 - 5	B	B - C	C	D	E
5 - 6	C	C - D	D	D	D
> 6	C	D	D	D	D

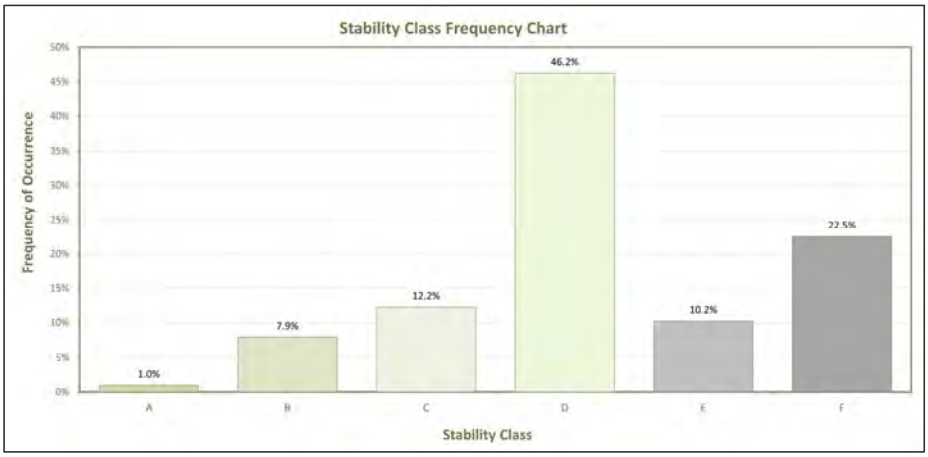
Source: (NOAA 2018)

Notes:

1. Strong insolation corresponds to sunny midday in midsummer in England, slight insolation to similar conditions in midwinter.
2. Night refers to the period from 1 hour before sunset to 1 hour after sunrise.3. The neutral category D should also be used, regardless of wind speed, for overcast conditions during day or night and for any sky conditions during the hour preceding or following night as defined above.

The frequency of each stability class predicted by CALMET at the site during the modelling period is presented in **Figure 11**. The results indicate a high frequency of conditions typical to Stability Class D. Stability Class D is indicative of neutral conditions, conducive to a moderate level of pollutant dispersion due to mechanical mixing.

Figure 11 Predicted Stability Class Frequencies at the site (CALMET predictions, 2023)

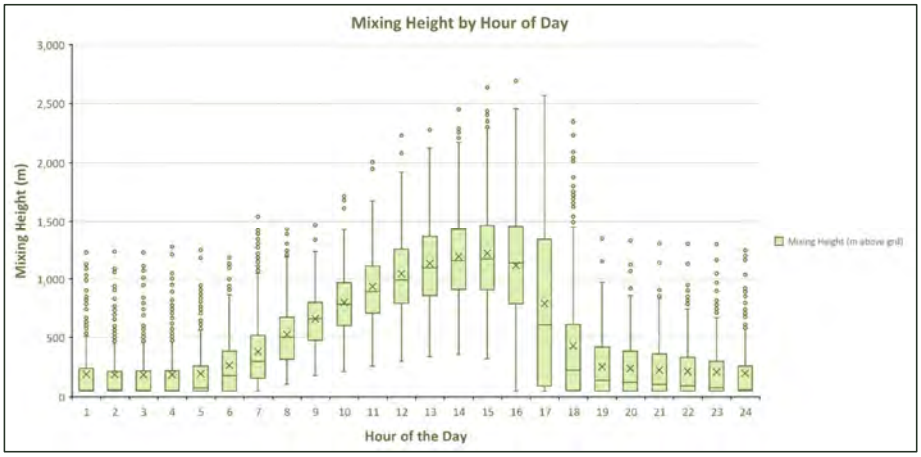


6.3.2 Mixing Heights

Diurnal variations in maximum and average mixing heights predicted by CALMET at the site during the 2023 modelling period are illustrated in **Figure 12**.

As would be expected, an increase in mixing depth during the morning is apparent, arising due to the onset of vertical mixing following sunrise. Maximum mixing heights occur in the mid to late afternoon, due to the dissipation of ground-based temperature inversions and growth of the convective mixing layer.

Figure 12 Predicted Mixing Heights at the site (CALMET predictions, 2023)



6.4 Dispersion Model Configuration

As discussed in **Section 6.1**, dispersion modelling was conducted using the CALPUFF dispersion model that uses three-dimensional meteorological data output from CALMET as input. This study utilised the CALPUFF dispersion model in full 3D mode, incorporating the 3D meteorological output from CALMET and the CSIRO prognostic meteorological model TAPM. Conservative assumptions have been made in deriving the odour emission rates to provide a worst-case assessment of potential off-site impacts. Odour emissions from the activities at the GSTP were represented by a series of area sources.

7.0 Odour Impact Assessment

This section identifies an appropriate odour impact assessment criterion for the GSTP and presents a summary of the odour impacts predicted by the modelling at the subject Site.

7.1 Adopted Odour Impact Assessment Criterion

The subject Site is zoned as RU4 Rural Small Holdings (see **Figure 2**). It is bordered by RU4 and RU5 Village to the southwest (existing residences of Gunning).

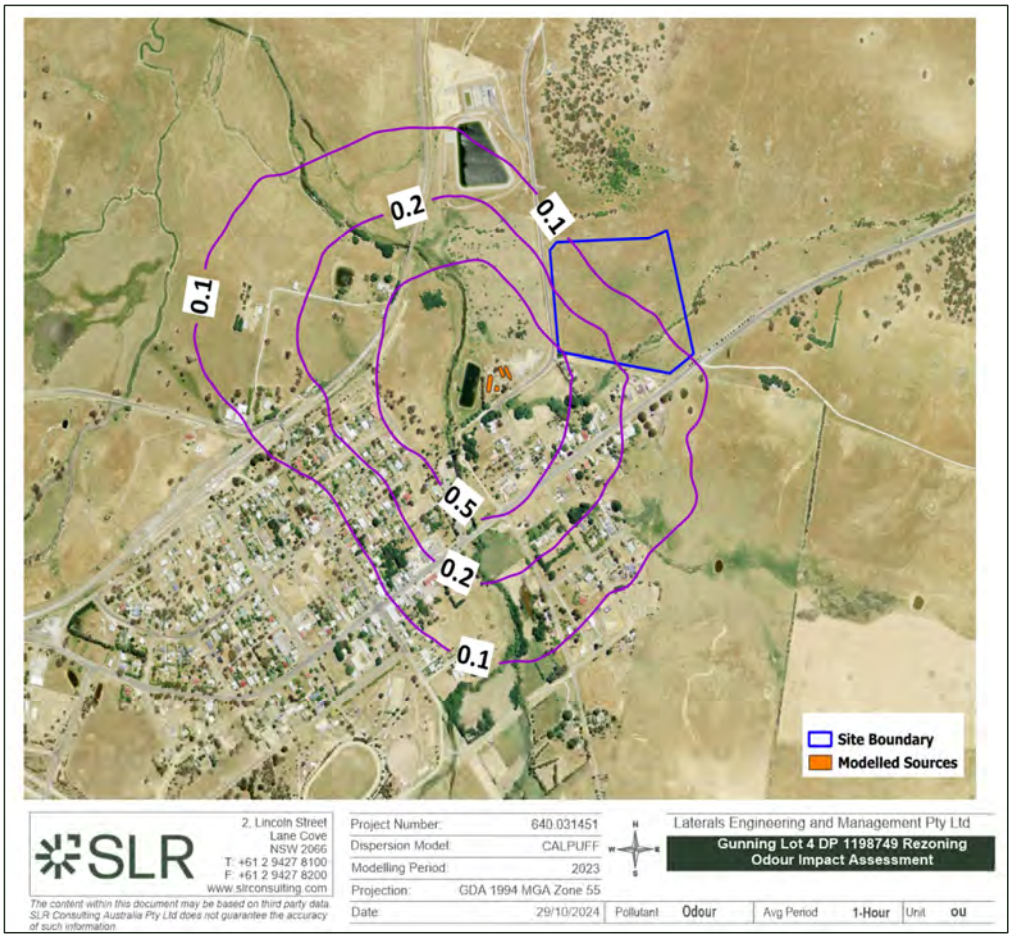
Based on the criteria presented in **Table 1** and given the zoning of the subject Site and surroundings, it can be assumed that the appropriate odour criteria would fall between 3 -5 ou. However, the current study has adopted a more stringent criterion of 2 ou (considering Urban area (> 2000)) as a conservative approach.

7.2 Dispersion Modelling Results

Dispersion modelling was performed to predict air quality impacts on the subject Site from existing GSTP. The 99th percentile nose-response-time odour concentrations predicted for the existing operations at the GSTP at the subject Site are presented as a contour plot in **Figure 13**. The results indicate that the predicted 99th percentile odour concentrations associated with the existing operation of the GSTP are well below the adopted stringent criterion of 2 ou at all locations of the Site.

It is noted that odour contour plots do not reflect odour concentrations occurring at any particular instant in time, but rather illustrate a compilation of the predicted 99th percentile (88th highest) nose response odour concentrations at all locations downwind, taking into account all combinations of meteorological conditions modelled across the modelling period.

Figure 13 Predicted Cumulative 99th Percentile (Nose Response Time) Odour Concentrations – Existing GSTP Operations



8.0 Conclusion

The GSTP has a design of 1,000 persons equivalent capacity, well below the 2,500 persons equivalent capacity requiring of a requiring an environmental impact statement Schedule 3 of the Environment Planning and Assessment (NSW Government, 2000). SLR understands that it is unlikely that the existing GSTP will be upgraded to increase its capacity in its current location.

The predicted 99th percentile odour concentrations associated with the existing operation of the GSTP are well below the conservatively adopted criterion of 2 ou at all locations of the Site and therefore SLR considers odour emissions from the GSTP to pose no constraint on the proposed development of the Site.

9.0 References

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10.0 Feedback

At SLR, we are committed to delivering professional quality service to our clients. We are constantly looking for ways to improve the quality of our deliverables and our service to our clients. Client feedback is a valuable tool in helping us prioritise services and resources according to our client needs.

To achieve this, your feedback on the team's performance, deliverables and service are valuable and SLR welcomes all feedback via https://www.slrconsulting.com/en/feedback. We recognise the value of your time and we will make a $10 donation to our Charity Partner - Lifeline, for every completed form.

Appendix A

Gunning Lot 4 DP 1198749 Rezoning

Odour Impact Assessment

Laterals Engineering and Management Pty Ltd

SLR Project No.: 640.031451.00001

7 November 2024

THE ODOUR UNIT

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Odour Concentration Measurement Report

Sampling and Laboratory Information

Organisation	SLR Consulting	Telephone	+61 2 9428 8124
Contact	A. Lawless	Email	alawless@slrconsulting.com
Sampling Site	Not disclosed	Sampling Personnel	SLR Consulting
Sampling Method	Not disclosed	Laboratory Location	Mascot, NSW

Order and Project Information

Order requested by	A. Lawless	Order accepted by	A. Schulz
Date of order	11/10/2024	TOU Project #	N1869
Order number	PO 35555	Project Manager	A. Schulz
Signed by	A. Lawless	Panel Operator	A. Schulz

Investigated Item	Odour concentration in odour units 'ou', determined by sensory odour concentration measurements, of an odour sample supplied in a sampling bag.
Identification	The odour sample bags were labelled individually. Each label recorded the testing laboratory, sample number, sampling location (or Identification), sampling date and time, dilution ratio (if dilution was used) and whether further chemical analysis was required.
Method	The odour concentration measurements were performed using dynamic olfactometry according to the Australian/New Zealand Standard: Stationary source emissions – *Part 3*: '*Determination of odour concentration by dynamic olfactometry* (AS/NZS 4323.3). The odour perception characteristics of the panel within the presentation series for the samples were analogous to that for butanol calibration. Any deviation from the Australian standard is recorded in the 'Comments' section of this report.
Measuring Range	The measuring range of the olfactometer is $2^2 \leq \chi \leq 2^{18}$ ou. If the measuring range was insufficient the odour samples will have been pre-diluted. The machine is not calibrated beyond dilution setting 2^{17}. This is specifically mentioned with the results.
Environment	The measurements were performed in an air- and odour-conditioned room. The room temperature is maintained at 22 °C ±3 °C.
Measuring Dates	The date of each measurement is specified with the results.
Instrument Used	The olfactometer used during this testing session was: TOU-OLF-004
Laboratory Precision	The precision of this laboratory (expressed as repeatability) for sensory quality must be $r \leq 0.477$ in accordance with the AS/NZS 4323.3. $r = 0.127$ Compliance – Yes
Laboratory Accuracy	The accuracy of this laboratory for sensory quality must be $A \leq 0.217$ in accordance with the AS/NZS 4323.3. $A = 0.209$ Compliance – Yes
Lower Detection Limit (LDL)	The LDL for the olfactometer has been determined to be 16 ou, which is 4 times the lowest dilution setting.
Traceability	The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards. The assessors are individually selected to comply with fixed criteria and are monitored in time to keep within the limits of the standard. The results from the assessors are traceable to primary standards of n-butanol in nitrogen. Note Disclaimers on last page of this document.

Accredited for compliance with ISO/IEC 17025 - Testing.
This report shall not be reproduced, except in full.

Date: Thursday, 24 October 2024 Panel Roster Number: SYD20241016_075

A. Schulz
Authorised Signatory

THE ODOUR UNIT

Accreditation Number: 14974

Odour Sample Measurement Results
Panel Roster Number: SYD20241016_075

Sample ID / Location	Laboratory ID	Sampling Date & Time	Analysis Date & Time	Panel Size	Valid ITEs	Final Odour Concentration (ou)
Pasveer Channel near inlet Pipe Aeration 15284	SC24551	15.10.2024 1028 - 1040 hrs	16.10.2024 1027 hrs	4	8	2,230
Pasveer Channel Aeration 15285	SC24552	15.10.2024 1027 - 1039 hrs	16.10.2024 1059 hrs	4	8	1,450
Pasveer Channel near inlet Pipe Post-Aeration 15286	SC24553	15.10.2024 1125 - 1139 hrs	16.10.2024 1128 hrs	4	8	118
Pasveer Channel Post-Aeration 15287	SC24554	15.10.2024 1125 - 1139 hrs	16.10.2024 1159 hrs	4	8	91
Septic Lagoon 15288	SC24555	15.10.2024 1236 - 1249 hrs	16.10.2024 1303 hrs	4	8	108

Samples Received in Laboratory – From: SLR Consulting (A. Lawless) Date: 16.10.2024 Time: 09:27 hrs

Note: The following are not covered by the NATA Accreditation issued to The Odour Unit:

1. The collection of samples by a method that is not prescribed by AS/NZS 4323.3.
2. Final results that have been modified by the dilution factors where parties other than The Odour Unit have performed the dilution of samples.

THE ODOUR UNIT

Accreditation Number: 14974

Odour Sample Measurement Results
Panel Roster Number: SYD20241016_075

Sample ID / Location	Laboratory ID	Sampling Date & Time	Analysis Date & Time	Panel Size	Valid ITEs	Final Odour Concentration (ou)
Septic Lagoon Replicate 15289	SC24556	15.10.2024 1226 - 1249 hrs	16.10.2024 1331 hrs	4	8	118
Dry Septic Pond 15290	SC24557	15.10.2024 1342 - 1401 hrs	16.10.2024 1355 hrs	4	8	99
Dry Septic Pond Replicate 15291	SC24558	15.10.2024 1340 - 1352 hrs	16.10.2024 1425 hrs	4	8	91
Wet Septic Pond 15292	SC24559	15.10.2024 1512 - 1524 hrs	16.10.2024 1454 hrs	4	8	118
Wet Septic Pond Replicate 15293	SC24560	15.10.2024 1448 - 1505 hrs	16.10.2024 1524 hrs	4	8	41

Samples Received in Laboratory – From: SLR Consulting (A. Lawless) Date: 16.10.2024 Time: 09:27 hrs

Note: The following are not covered by the NATA Accreditation issued to The Odour Unit:

1. The collection of samples by a method that is not prescribed by AS/NZS 4323.3.
2. Final results that have been modified by the dilution factors where parties other than The Odour Unit have performed the dilution of samples.

THE ODOUR UNIT

Accreditation Number: 14974

Odour Panel Calibration Results

Reference Odorant	Reference Odorant Panel Roster Number	Concentration of Reference gas (ppb)	Panel Target Range for n-butanol (ppb)	Measured Concentration (ou)	Measured Panel Threshold (ppb)	Does this panel calibration measurement comply with AS/NZS 4323.3 (Yes / No)
n-butanol	SYD20241016_075	44,200	$20 \leq \chi \leq 80$	724	61	Yes

Comments: Odour characters (non-NATA accredited) as determined by odour laboratory panel:

Laboratory ID	Odour Character	Laboratory ID	Odour Character
SC24551	cabbage, sewage, onion	SC24556	musty, sewage
SC24552	cabbage, sewage, onion	SC24557	sour
SC24553	sewage	SC24558	sour
SC24554	sewage	SC24559	muddy water
SC24555	sewage	SC24560	muddy water

Departures: Clause 9.5.3 (d) – Cross-sectional distribution of airflow and concentration from port openings are not checked due to the impracticality of the requirement.

Disclaimers:
1. Parties, other than The Odour Unit, responsible for collecting odour samples have advised that they have voluntarily furnished these odour samples, appropriately collected and labelled, to The Odour Unit for the purpose of odour testing.
2. The collection of odour samples by parties other than The Odour Unit relinquishes The Odour Unit from all responsibility for the sample collection and any effects or actions that the results from the test(s) may have.
3. Any comments included in, or attachments to, this Report are not covered by the NATA Accreditation issued to The Odour Unit.
4. This report shall not be reproduced, except in full, without written approval of The Odour Unit.

Report Status

Status	Version	Prepared by	Date	Checked by	Date	Change	Reason
Draft	0.1	A. Schulz	18.10.2024	--	--	--	--
Final	1.0	--	--	I. Farrugia	18.10.2024	--	--
Revised	1.1	A. Schulz	24.10.2024	--	--	Sample ID's	Client Request

END OF DOCUMENT

Appendix B

Gunning Lot 4 DP 1198749 Rezoning

Odour Impact Assessment

Laterals Engineering and Management Pty Ltd

SLR Project No.: 640.031451.00001

7 November 2024

B.1 SELECTION OF REPRESENTATIVE METEOROLOGICAL DATA

Once emitted to atmosphere, emissions will:

- Rise according to the momentum and buoyancy of the emission at the discharge point relative to the prevailing atmospheric conditions;
- Be adverted from the source according to the strength and direction of the wind at the height which the plume has risen in the atmosphere;
- Be diluted due to mixing with the ambient air, according to the intensity of turbulence; and
- (Potentially) be chemically transformed and/or depleted by deposition processes.

Dispersion is the combined effect of these processes.

Dispersion modelling is used as a tool to simulate the air quality effects of specific emission sources, given the meteorology typical for a local area together with the expected emissions. Selection of a year when the meteorological data is atypical means that the resultant predictions may not appropriately represent the most likely air quality impacts. Therefore, in dispersion modelling, one of the key considerations is the representative nature of the meteorological data used.

The year of meteorological data used for the dispersion modelling was selected by reviewing the most recent five years of historical surface observations at Moss Vale AWS (2017 to 2021 inclusive) to determine the year that is most representative of average conditions. Wind direction, wind speed, and ambient temperature were compared to the region's averages to determine the most representative year.

Data collected from 2017 to 2021 is summarised in **Figure B1** to **Figure B3**. Examination of the data indicates the following:

- **Figure B1** indicates relatively similar wind roses for all years analysed. Although it is noted that the most significant difference is observed for the year 2023, since the subject Site is located to the northeast of the GSTP 2023 (with a higher frequency of westerly winds), it is the worst-case year in this case.
- Error! Reference source not found.**B2** indicates that 2023 exhibits wind speeds that are closest to the long-term average for most of the months; and
- **Figure B3** shows that temperatures in 2023 more closely reflect the long-term average.

Given the above considerations, the year 2023 was selected as the representative year of meteorology.

Figure B1 Frequency of Winds at Goulburn Airport AWS for 2019 – 2023

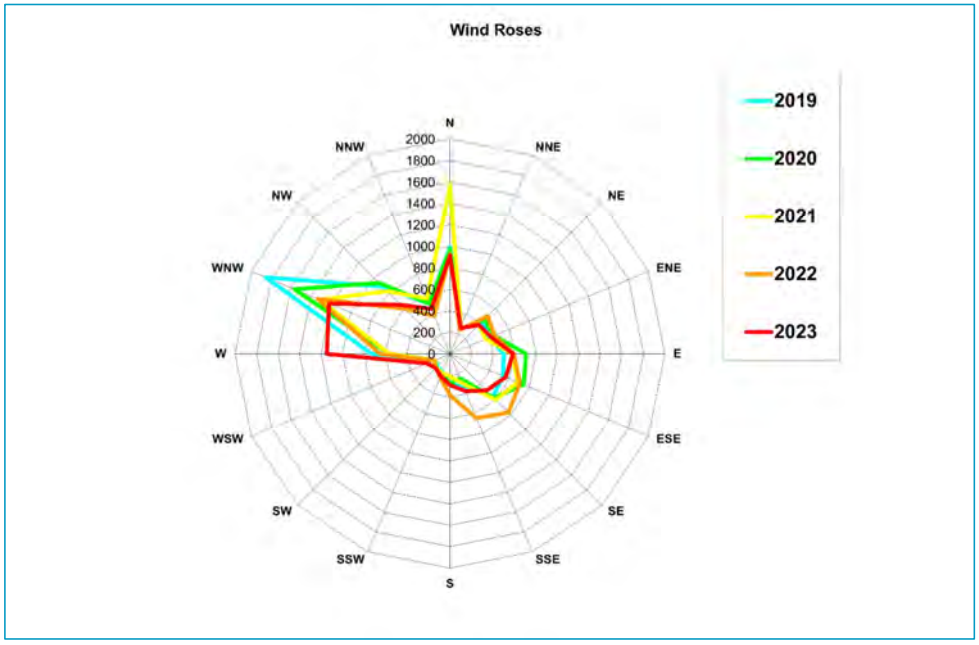


Figure B2 Monthly Average Wind Speed at Goulburn Airport AWS for 2019 – 2023

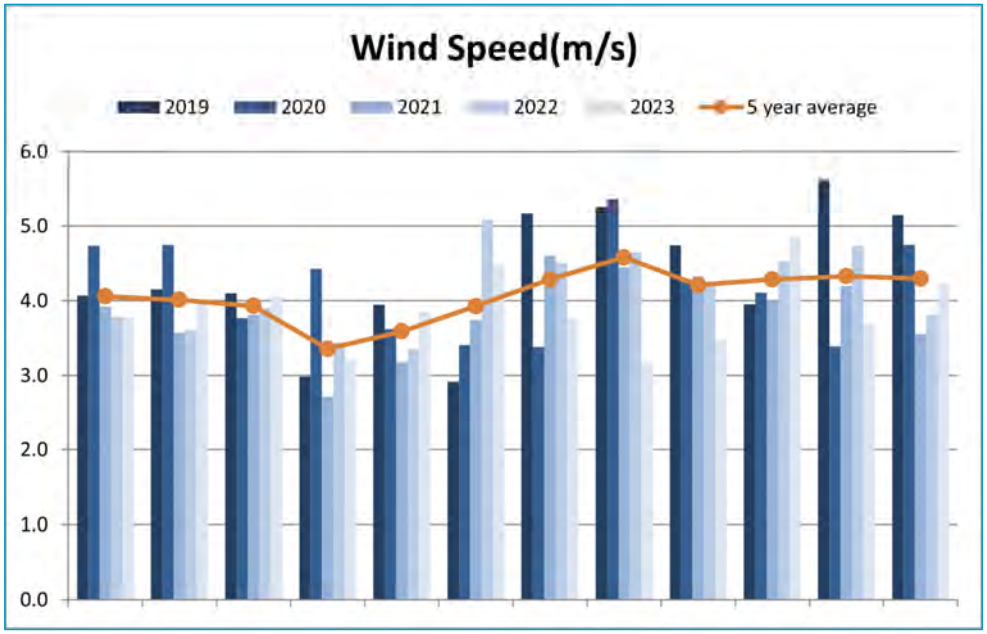
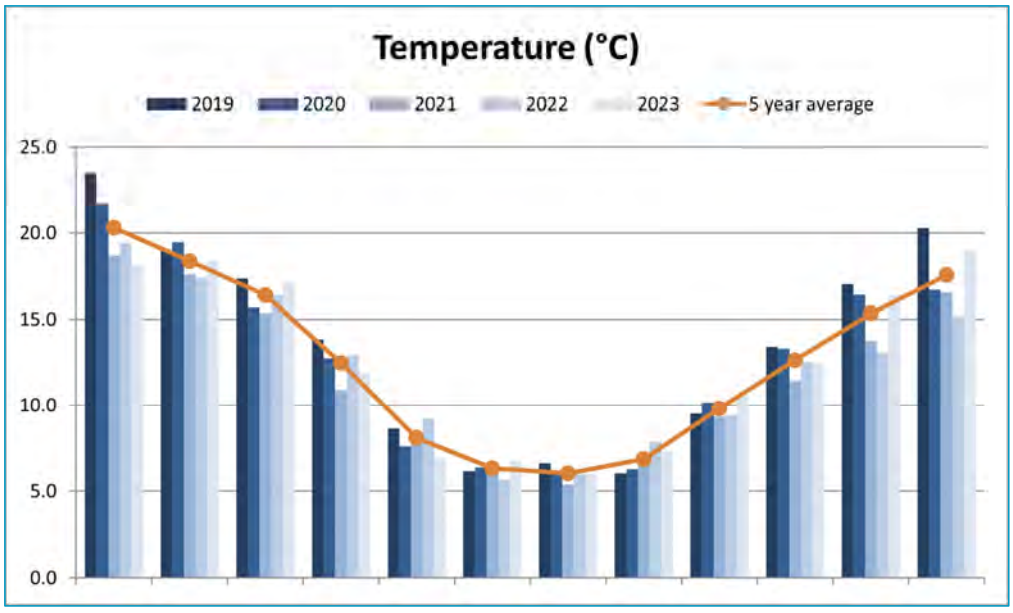
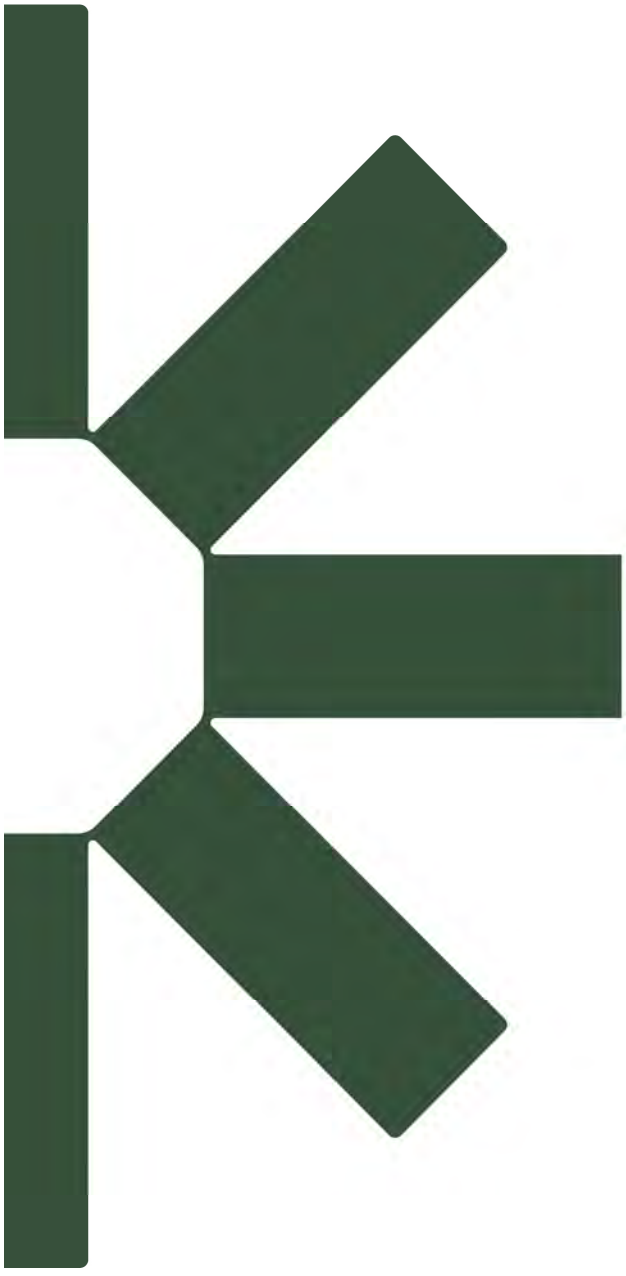


Figure B3 Monthly Average Temperature at Goulburn Airport AWS for 2019 – 2023





Making Sustainability Happen

TRAFFIC IMPACT ASSESSMENT

Proposed Subdivision

18 Boureong Drive, Gunning

Prepared for: Stuart Duke

N244184A (version 1b)

August 2024

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Contents

1. Introduction

Motion Traffic Engineers was commissioned by Stuart Duke to undertake a traffic impact assessment of a proposed subdivision for 18 Boureong Drive, Gunning.

Currently, the site is mostly vacant with a single house at the north-east part. The planning proposal to change the zoning and lot size is to enable a future subdivision of the land.

This traffic report presents an assessment of the anticipated transport implications of the proposed subdivision, with the following considerations:

- Background and existing traffic and parking conditions of the proposed residential subdivision
- Assessment of the public transport network within the vicinity of the site
- The projected traffic generation of the subdivision
- The transport impact of the proposed subdivision on the surrounding road network

In the course of preparing this assessment, the proposed subdivision and its environs have been inspected, plans of the development examined, and all relevant traffic and parking data collected and analysed.

2.Background and Existing Conditions

2.1. Location and Land Use

The proposed subdivision is located at 18 Boureong Drive, Gunning in a rural/residential area with residences and farm sheds. The subdivision has frontage to Ryan Place, Boureong Drive, Sands Street (to be built) and Yass Street. The site is a short drive to Gunning Public School and Gunning Train Station.

Figure 1 shows topographic details of the proposed subdivision. Sands Street may be built as part of the proposed subdivision. Figure 2 shows a photograph of the site taken from Ryan Place.

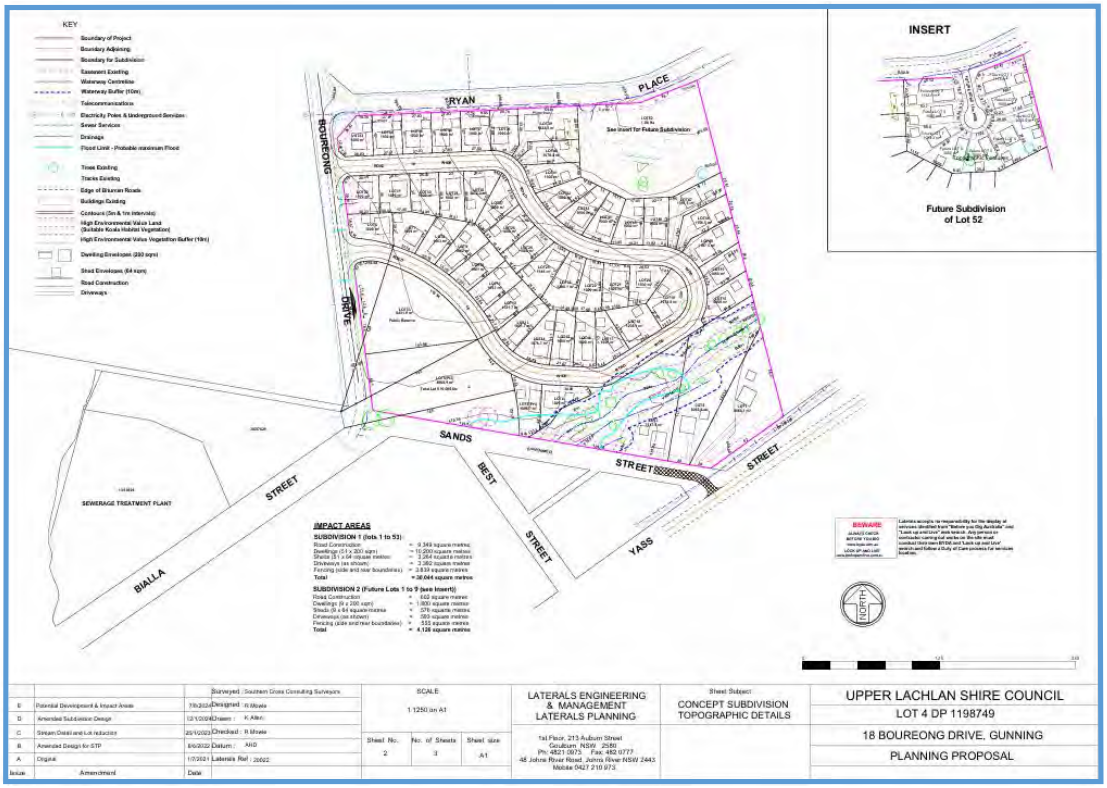


Figure 1: Proposed Subdivision

Figure 2: Photograph of Proposed Subdivision from Ryan Place

2.2. Road Network

This section describes the nearby roads near the proposed subdivision.

Yass Street is a rural road with one lane of traffic each way adjacent to the subdivision. Double barrier line separates the opposing lanes at the mid-block. Edge lines are marked on both sides of the road. The sign posted speed limit is 50km/hr. A road shoulder is provided for emergency parking such as a car breakdown. Figure 4a shows a photograph of Yass Street. Yass Street is classified, in planning responsibility, as a regional road by Transport for New South Wales.

Boureong Drive is a local road with one lane of traffic each way and ends in cul-de-sac. The default speed limit is 50km/hr. A road shoulder is provided for emergency parking such as a car breakdown. Figure 4b shows a photograph of Boureong Drive.

Ryan Place is a local road runs off Boureong Drive with one lane of traffic each way and ends in a cul-de-sac. The default speed limit is 50km/hr. A road shoulder is provided for emergency parking. Figure 4c shows a photograph of Ryan Place with reflective markers on a guide post (to improve visibility in low light conditions)..

Figure 4a: Yass Street looking West from the intersection with Wombat Street

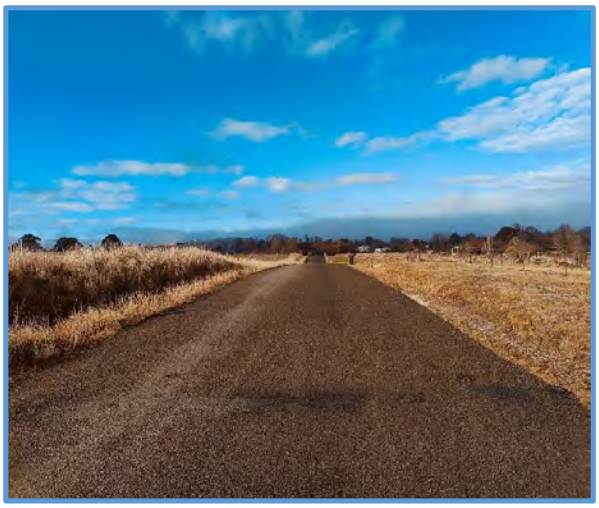


Figure 4b: Boureong Drive looking North from the intersection with Ryan Place

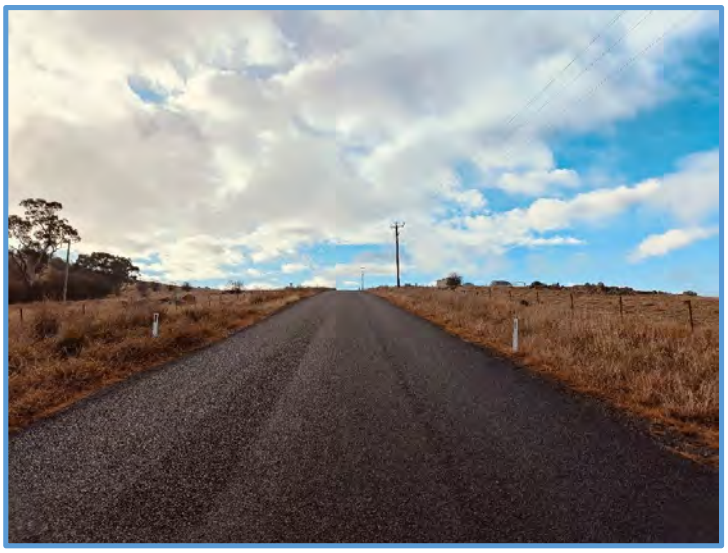


Figure 4c: Ryan Place looking East from the intersection with Boureong Drive

2.3.Public Transport

The proposed subdivision has access to a school bus service that runs from Yass Street to Ryan Place to pick up all school children who attend the Gunning Public School.

2.4. Intersection Description

As part of the traffic impact assessment, the performance of two nearby intersections was surveyed and assessed:

- The priority intersection of Yass Street with Wombat Street
- The priority intersection of Boureong Drive with Ryan Place

The priority intersection of Yass Street with Wombat Street is a four-leg intersection, with all turn movements permitted. Drivers on Wombat Street need to give way to vehicles on Yass Street. Figure 5a and 5b present photographs of the intersection on aerial and the layout of this intersection using SIDRA 9.1 - an industry-standard intersection software.

The priority intersection of Boureong Drive with Ryan Place is a three-leg intersection, with all turn movements permitted. Drivers on Ryan Place need to give way to vehicles on Boureong Drive. Figure 5c and 5d present photographs of the intersection on aerial and the layout of this intersection using SIDRA.

External traffic to and from the proposed subdivision s likely to travel through the above intersections.

Figure 5a: The priority intersection of Yass Street with Wombat Street (aerial)

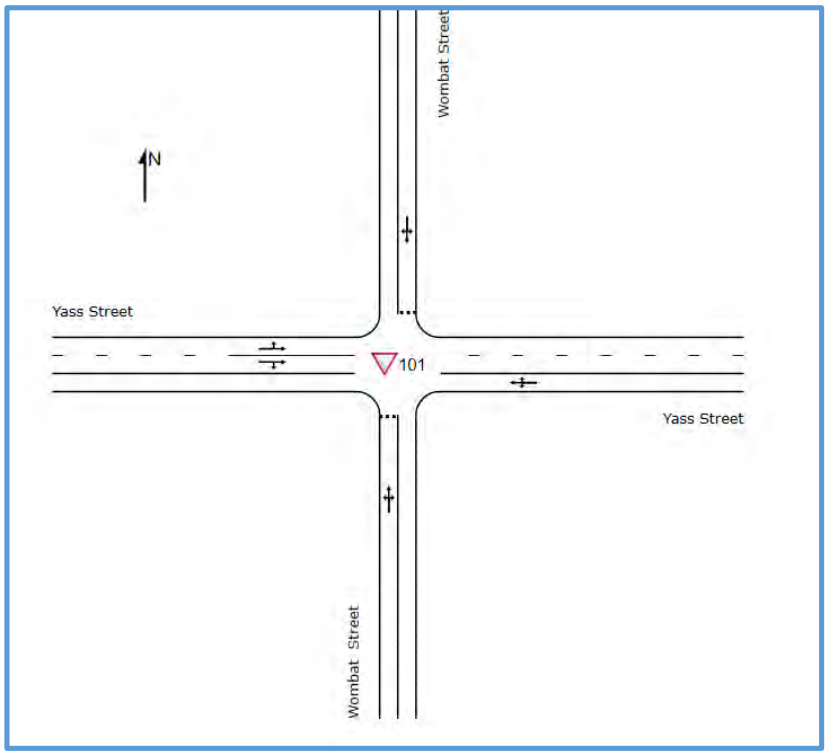


Figure 5b: The priority intersection of Yass Street with Wombat Street (SIDRA)

Figure 5c: The priority intersection of Boureong Drive with Ryan Place (aerial)

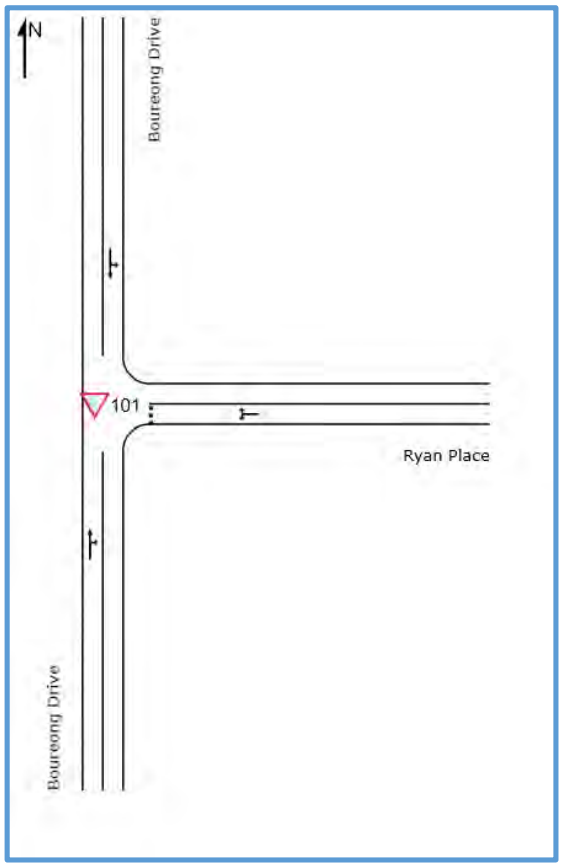


Figure 5d: The priority intersection of Boureong Drive with Ryan Place (SIDRA)

2.5. Existing Traffic Volumes

As part of the traffic assessment, traffic counts have been undertaken at the above-mentioned intersections and the AM and PM peak hours are identified accordingly. The AM peak hour is 8am to 9am and the PM peak hour is 4:45pm to 5:45pm.

The following Figures present the traffic volumes in vehicles for the weekday peak hours. The bracketed numbers are trucks, and un-bracketed are cars. The traffic volumes are low in both peak hours.

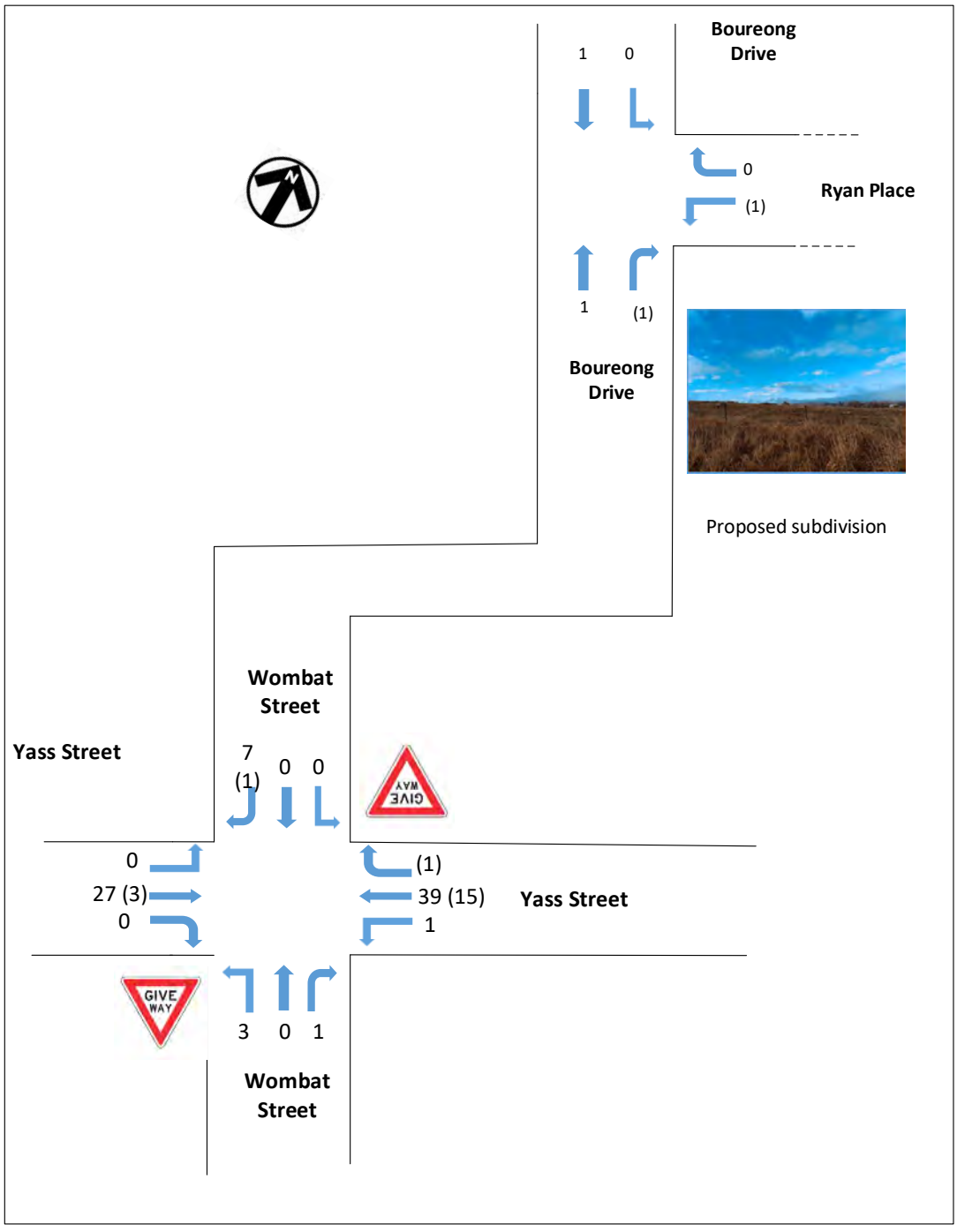


Figure 6a: Existing Weekday Traffic Volumes AM Peak Hour

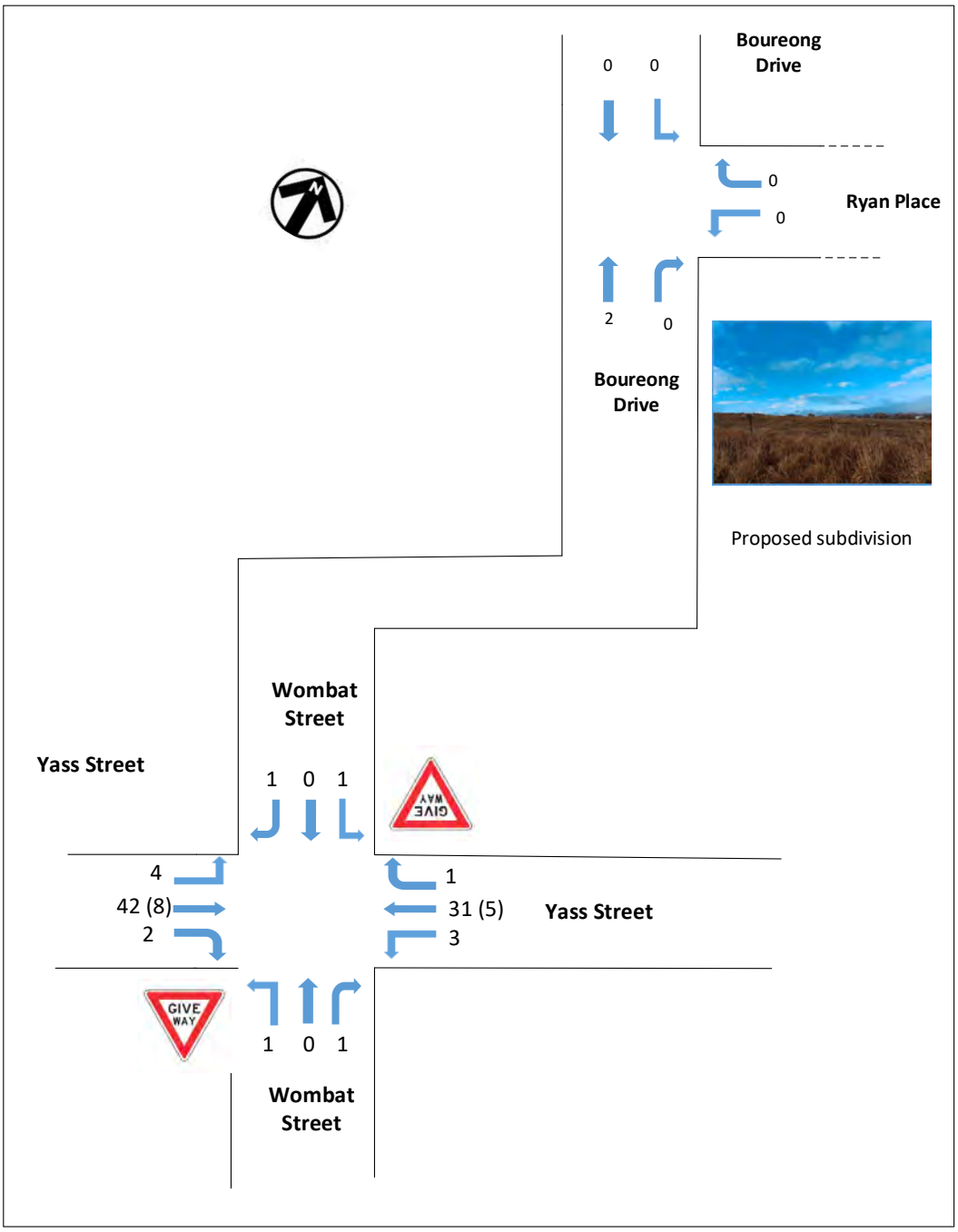


Figure 7b: Existing Weekday Traffic Volumes PM Peak Hour

2.6.Intersection Assessment with Existing Traffic

An intersection assessment has been undertaken for:

- The priority intersection of Yass Street with Wombat Street
- The priority intersection of Boureong Drive with Ryan Place

The existing intersection operating performance was assessed using the SIDRA software package (version 9) to determine the Degree of Saturation (DS), Average Delay (AVD in seconds) and Level of Service (LoS) at each intersection. The SIDRA program provides Level of Service Criteria Tables for various intersection types. The key indicator of intersection performance is Level of Service, where results are placed on a continuum from 'A' to 'F', as shown in Table 1.

LoS	Traffic Signal / Roundabout	Give Way / Stop Sign / T-Junction control
A	Good operation	Good operation
B	Good with acceptable delays and spare capacity	Acceptable delays and spare capacity
C	Satisfactory	Satisfactory, but accident study required
D	Operating near capacity	Near capacity & accident study required
E	At capacity, at signals incidents will cause excessive delays.	At capacity, requires other control mode
F	Unsatisfactory and requires additional capacity, Roundabouts require other control mode	At capacity, requires other control mode

Table 1: Intersection Level of Service

The Average Vehicle Delay (AVD) provides a measure of the operational performance of an intersection as indicated below, which relates AVD to LOS. The AVD's should be taken as a guide only as longer delays could be tolerated in some locations (i.e., inner city conditions) and on some roads (i.e. minor side street intersecting with a major arterial route). For traffic signals, the average delay over all movements should be taken. For roundabouts and priority control intersections (sign control) the critical movement for level of service assessment should be that movement with the highest average delay.

LoS	Average Delay per Vehicles (seconds/vehicle)
A	Less than 14
B	15 to 28
C	29 to 42
D	43 to 56
E	57 to 70
F	>70

Table 2: Intersection Average Delay (AVD)

The degree of saturation (DS) is another measure of the operational performance of individual intersections. For intersections controlled by traffic signals both queue length and delay increase rapidly as DS approaches 1. It is usual to attempt to keep DS to less than 0.9. Degrees of Saturation in the order of 0.7 generally represent satisfactory intersection operation. When DS exceed 0.9 queues can be anticipated.

The results of the intersection analysis are as follows:

Intersection/ Performance criteria	AM Peak Hour Existing	PM Peak Hour Existing
Yass Street - Wombat Street *LoS* *AVD(s)* *DS*	N/A (worst case LoS A) 1.5 0.036	N/A (worst case LoS A) 0.7 0.014
Boureong Drive - Ryan Place *LoS* *AVD(s)* *DS*	N/A (worst case LoS A) 3.0 0.001	N/A (worst case LoS A) 2.6 0.002

Both intersections are operating at good level of services with the current traffic volume. There is spare capacity at these intersections to accommodate additional traffic volume. The full SIDRA results are presented in Appendix A.

2.7.Conclusions on the Existing Conditions

The nearby intersections overall perform well with sufficient spare capacity to accommodate additional traffic.

3. Proposed Subdivision

A description of the proposed Subdivision are as follows:

- Construction of proposed Subdivision with an additional 60 residential lots
  - The lot size ranges from 1000m^2 to 10,056 m^2
- The lots could be built with houses or other permitted uses in a residential zone (if approved)
- One local road may be constructed, namely the Sands Street (see Figure 1) intersecting Yass Street. The road and intersection will disperse the subdivision traffic across the local road network to avoid local congestion.
- The road design and intersections will be subject to Council's and TfNSW requirements (if approved).

A full scaled plan of the proposed subdivision is provided as part of the Planning Proposal application to rezone the land.

4.Traffic Generation and Impact

4.1. Traffic Generation and Distribution

Each lot will need separate council approval for a residential home or other permitted land uses.

For the purposes of a traffic assessment only it is assumed that each lot generates one trip in the weekday peak hours. As a comparison, a low-density residential house has a trip rate *0.78 trips per dwelling in a regional area* for the weekday peak hours (as set out in the updates of *NSW RTA Guide to Traffic Generating Developments)*. Therefore, this scenario is a "worst-case scenario".

The proposed subdivision, as per above, will generate 60 car trips in the weekday peak hours. It is expected to generate a medium number of additional trips in both AM and PM peak hours

The assumed trip distribution is 90 percent outbound, and 100 percent inbound in the AM peak hour and vice versa for the PM peak hour. The trip distribution is as follows:

- 54 outbound trips and 6 inbound trips in the AM peak hour
- 6 outbound trips and 54 inbound trips in the PM peak hour

4.2. Existing with Subdivision Traffic

The additional development trips are assigned onto the local traffic network. The following figures present the future traffic volume with the development trips (in red for origin trips and blue for destination trips) for the weekday AM and PM peak hours.

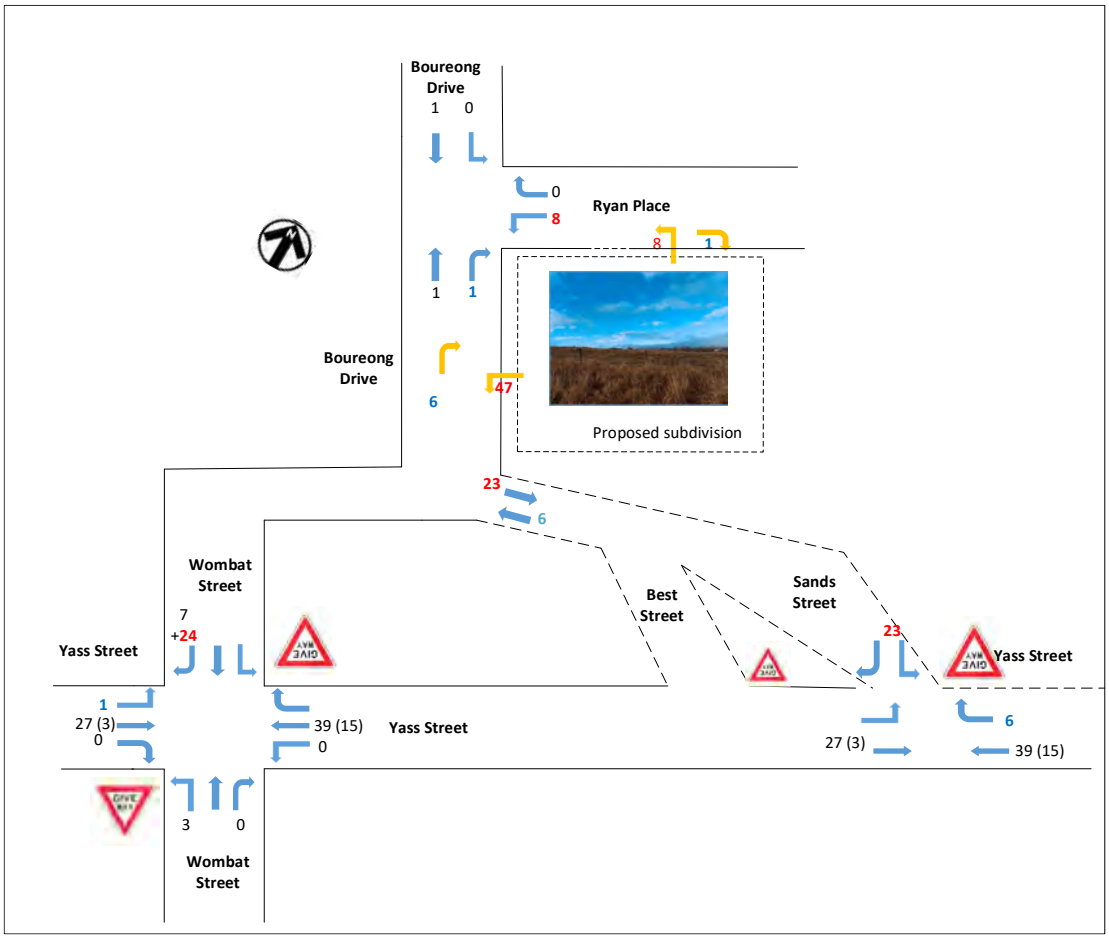


Figure 8a: Existing Weekday Traffic Volumes with proposed Subdivision Traffic AM Peak Hour

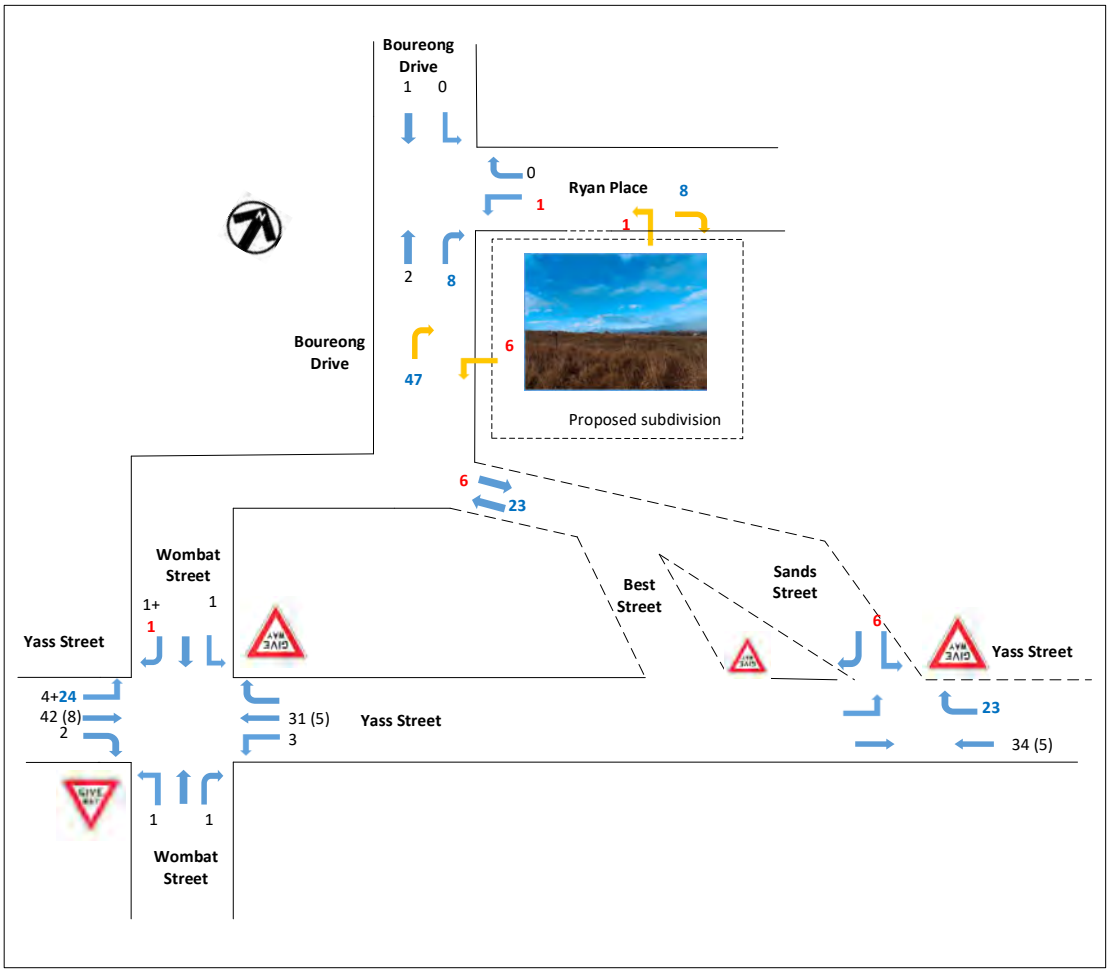


Figure 8b: Existing Weekday Traffic Volumes with proposed Subdivision Traffic PM Peak Hour

4.3. Proposed Intersection on Yass Street

As discussed previously, there may be a proposed intersection with Sand Street connecting to Yass Street. The layout of the intersection is presented below in SIDRA.

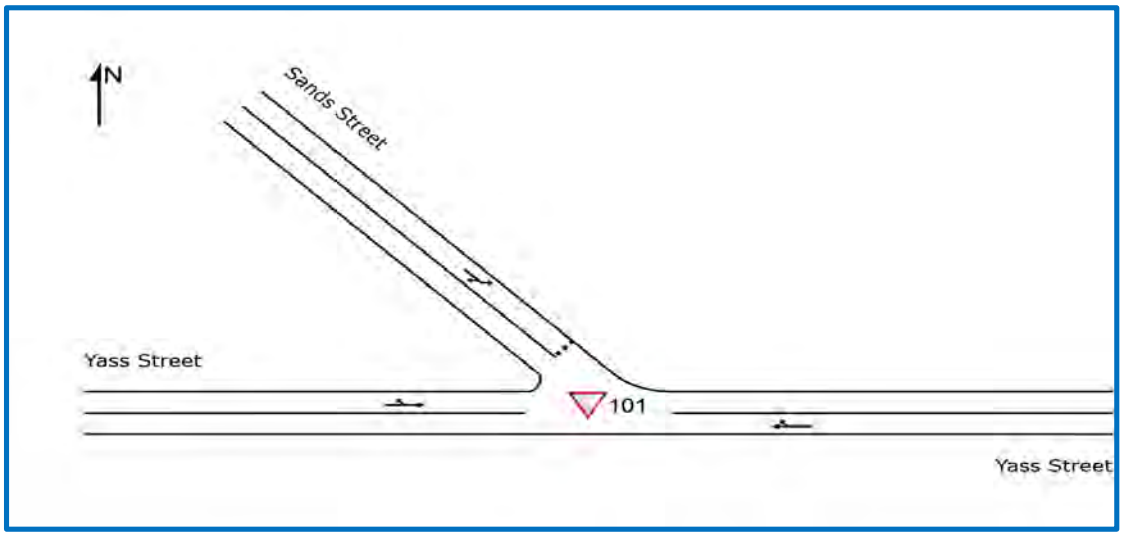


Figure : Priority Intersection of Yass Street with Sands Street

4.4. Traffic Impact

This section assesses the following intersections for the existing traffic with the proposed subdivision traffic. The results of the intersection assessment are as follows for the existing and proposed intersections.

Intersection/ Performance criteria	Existing Traffic		Existing and proposed Traffic	
	AM Peak Hour Existing	PM Peak Hour Existing	AM Peak Hour Projected	PM Peak Hour Projected
Yass Street - Wombat Street *LoS* *AVD(s)* *DS*	N/A (worst case LoS A) 1.5 0.036	N/A (worst case LoS A) 0.7 0.014	N/A (worst case LoS A) 2.1 0.038	N/A (worst case LoS A) 1.5 0.024
Boureong Drive - Ryan Place *LoS* *AVD(s)* *DS*	N/A (worst case LoS A) 3.0 0.001	N/A (worst case LoS A) 2.6 0.002	N/A (worst case LoS A) 3.9 0.006	N/A (worst case LoS A) 3.6 0.006
Yass Street - Sands Street *LoS* *AVD(s)* *DS*			N/A (worst case LoS A) 1.1 0.038	N/A (worst case LoS A) 1.2 0.036

Table 6: Projected Intersection Performance with proposed Subdivision Traffic

As presented in Table 6 above, the additional trips generated by the proposed Subdivision have minimum impact on the intersection performances in both AM and PM peak hours. The LoS, AVD and DS of each intersection are not significantly affected by the addition of proposed subdivision traffic. The traffic impact of the proposed subdivision is therefore considered acceptable.

The full SIDRA results are presented in Appendix B for the existing with the proposed subdivision traffic.

5. Conclusions

This traffic impact assessment report relates to a proposed subdivision at 18 Boureong Drive, Gunning. Based on the analysis and discussions presented in this report, the following conclusions are made:

- The subdivision site is located in a regional area with existing access to a school bus service. A school bus stop will be provided to service the proposed subdivision.
- The nearby intersections currently operate at good levels of service.
- Each lot of the proposed subdivision will be subject to (separate) council approval for residential use.
- The proposed subdivision is expected to generate a medium number of additional trips in both AM and PM peak hours.
- According to the Intersection Assessment, the additional trips can be accommodated in the nearby intersections without significantly affecting the performance of any turn movement, approach arm or the overall intersection.

There are no general traffic engineering reasons why a development consent for the proposed Subdivision at 18 Boureong Drive, Gunning should not be granted.

APPENDIX A

INTERSECTION ASSESSMENT FOR EXISTING TRAFFIC

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Wombat Street															
1	L2	All MCs	3	0.0	3	0.0	0.004	4.7	LOS A	0.0	0.1	0.18	0.48	0.18	45.7
2	T1	All MCs	1	0.0	1	0.0	0.004	4.0	LOS A	0.0	0.1	0.18	0.48	0.18	46.0
3	R2	All MCs	1	0.0	1	0.0	0.004	5.3	LOS A	0.0	0.1	0.18	0.48	0.18	45.5
Approach			5	0.0	5	0.0	0.004	4.7	LOS A	0.0	0.1	0.18	0.48	0.18	45.7
East: Yass Street															
4	L2	All MCs	1	0.0	1	0.0	0.036	4.6	LOS A	0.0	0.1	0.01	0.02	0.01	48.6
5	T1	All MCs	57	27.8	57	27.8	0.036	0.0	LOS A	0.0	0.1	0.01	0.02	0.01	49.8
6	R2	All MCs	1	0.0	1	0.0	0.036	4.6	LOS A	0.0	0.1	0.01	0.02	0.01	48.5
Approach			59	26.8	59	26.8	0.036	0.2	NA	0.0	0.1	0.01	0.02	0.01	49.8
North: Wombat Street															
7	L2	All MCs	1	0.0	1	0.0	0.010	4.6	LOS A	0.0	0.3	0.22	0.50	0.22	45.5
8	T1	All MCs	1	0.0	1	0.0	0.010	4.0	LOS A	0.0	0.3	0.22	0.50	0.22	45.8
9	R2	All MCs	7	0.0	7	0.0	0.010	5.3	LOS A	0.0	0.3	0.22	0.50	0.22	45.5
Approach			9	0.0	9	0.0	0.010	5.1	LOS A	0.0	0.3	0.22	0.50	0.22	45.5
West: Yass Street															
10	L2	All MCs	1	0.0	1	0.0	0.015	4.6	LOS A	0.0	0.0	0.00	0.02	0.00	48.6
11	T1	All MCs	32	10.0	32	10.0	0.015	0.0	LOS A	0.1	0.5	0.03	0.08	0.03	49.4
12	R2	All MCs	19	16.7	19	16.7	0.015	4.9	LOS A	0.1	0.5	0.16	0.42	0.16	45.7
Approach			52	12.2	52	12.2	0.015	1.9	NA	0.1	0.5	0.08	0.21	0.08	48.0
All Vehicles			125	17.6	125	17.6	0.036	1.5	NA	0.1	0.5	0.06	0.15	0.06	48.5

Table A1: Weekday Priority Intersection Performance of Yass Street with Wombat Street for the AM Peak Hour

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Wombat Street															
1	L2	All MCs	1	0.0	1	0.0	0.003	4.7	LOS A	0.0	0.1	0.17	0.47	0.17	45.8
2	T1	All MCs	1	0.0	1	0.0	0.003	3.9	LOS A	0.0	0.1	0.17	0.47	0.17	46.1
3	R2	All MCs	1	0.0	1	0.0	0.003	5.2	LOS A	0.0	0.1	0.17	0.47	0.17	45.6
Approach			3	0.0	3	0.0	0.003	4.6	LOS A	0.0	0.1	0.17	0.47	0.17	45.8
East: Yass Street															
4	L2	All MCs	3	0.0	3	0.0	0.024	4.6	LOS A	0.0	0.1	0.01	0.06	0.01	48.4
5	T1	All MCs	38	13.9	38	13.9	0.024	0.0	LOS A	0.0	0.1	0.01	0.06	0.01	49.6
6	R2	All MCs	1	0.0	1	0.0	0.024	4.6	LOS A	0.0	0.1	0.01	0.06	0.01	48.3
Approach			42	12.5	42	12.5	0.024	0.5	NA	0.0	0.1	0.01	0.06	0.01	49.5
North: Wombat Street															
7	L2	All MCs	1	0.0	1	0.0	0.003	4.6	LOS A	0.0	0.1	0.15	0.47	0.15	45.8
8	T1	All MCs	1	0.0	1	0.0	0.003	3.9	LOS A	0.0	0.1	0.15	0.47	0.15	46.1
9	R2	All MCs	1	0.0	1	0.0	0.003	5.2	LOS A	0.0	0.1	0.15	0.47	0.15	45.7
Approach			3	0.0	3	0.0	0.003	4.6	LOS A	0.0	0.1	0.15	0.47	0.15	45.9
West: Yass Street															
10	L2	All MCs	4	0.0	4	0.0	0.017	4.6	LOS A	0.0	0.0	0.00	0.08	0.00	48.3
11	T1	All MCs	53	16.0	53	16.0	0.017	0.0	LOS A	0.0	0.1	0.01	0.06	0.01	49.6
12	R2	All MCs	2	0.0	2	0.0	0.017	4.6	LOS A	0.0	0.1	0.02	0.04	0.02	48.2
Approach			59	14.3	59	14.3	0.017	0.5	NA	0.0	0.1	0.01	0.06	0.01	49.4
All Vehicles			107	12.7	107	12.7	0.024	0.7	NA	0.0	0.1	0.02	0.08	0.02	49.2

Table A2: Weekday Priority Intersection Performance of Yass Street with Wombat Street for the PM Peak Hour

Vehicle Movement Performance																
Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Boureong Drive																
2	T1	All MCs	1	0.0	1	0.0	0.001	0.0	LOS A	0.0	0.0	0.02	0.28	0.02	48.4
3	R2	All MCs	1	0.0	1	0.0	0.001	4.6	LOS A	0.0	0.0	0.02	0.28	0.02	47.1
Approach			2	0.0	2	0.0	0.001	2.3	NA	0.0	0.0	0.02	0.28	0.02	47.7
East: Ryan Place																
4	L2	All MCs	1	0.0	1	0.0	0.001	4.6	LOS A	0.0	0.0	0.01	0.54	0.01	45.9
6	R2	All MCs	1	0.0	1	0.0	0.001	4.6	LOS A	0.0	0.0	0.01	0.54	0.01	45.7
Approach			2	0.0	2	0.0	0.001	4.6	LOS A	0.0	0.0	0.01	0.54	0.01	45.8
North: Boureong Drive																
7	L2	All MCs	1	0.0	1	0.0	0.001	4.6	LOS A	0.0	0.0	0.00	0.27	0.00	47.3
8	T1	All MCs	1	0.0	1	0.0	0.001	0.0	LOS A	0.0	0.0	0.00	0.27	0.00	48.5
Approach			2	0.0	2	0.0	0.001	2.3	NA	0.0	0.0	0.00	0.27	0.00	47.9
All Vehicles			6	0.0	6	0.0	0.001	3.0	NA	0.0	0.0	0.01	0.36	0.01	47.1

Table A3: Weekday Priority Intersection Performance of Boureong Drive with Ryan Place for the AM Peak Hour

Vehicle Movement Performance																
Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Boureong Drive																
2	T1	All MCs	2	0.0	2	0.0	0.002	0.0	LOS A	0.0	0.0	0.01	0.19	0.01	48.9
3	R2	All MCs	1	0.0	1	0.0	0.002	4.6	LOS A	0.0	0.0	0.01	0.19	0.01	47.5
Approach			3	0.0	3	0.0	0.002	1.5	NA	0.0	0.0	0.01	0.19	0.01	48.5
East: Ryan Place																
4	L2	All MCs	1	0.0	1	0.0	0.001	4.6	LOS A	0.0	0.0	0.02	0.54	0.02	45.9
6	R2	All MCs	1	0.0	1	0.0	0.001	4.6	LOS A	0.0	0.0	0.02	0.54	0.02	45.7
Approach			2	0.0	2	0.0	0.001	4.6	LOS A	0.0	0.0	0.02	0.54	0.02	45.8
North: Boureong Drive																
7	L2	All MCs	1	0.0	1	0.0	0.001	4.6	LOS A	0.0	0.0	0.00	0.27	0.00	47.3
8	T1	All MCs	1	0.0	1	0.0	0.001	0.0	LOS A	0.0	0.0	0.00	0.27	0.00	48.5
Approach			2	0.0	2	0.0	0.001	2.3	NA	0.0	0.0	0.00	0.27	0.00	47.9
All Vehicles			7	0.0	7	0.0	0.002	2.6	NA	0.0	0.0	0.01	0.31	0.01	47.5

Table A4: Weekday Priority Intersection Performance of Boureong Drive with Ryan Place for the PM Peak Hour

APPENDIX B

INTERSECTION ASSESSMENT FOR EXISTING WITH SUBDIVISION TRAFFIC

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Wombat Street														
1	L2	3	0	3	0.0	0.004	4.7	LOS A	0.0	0.1	0.17	0.48	0.17	46.4
2	T1	1	0	1	0.0	0.004	4.0	LOS A	0.0	0.1	0.17	0.48	0.17	46.6
3	R2	1	0	1	0.0	0.004	5.3	LOS A	0.0	0.1	0.17	0.48	0.17	45.9
Approach		5	0	5	0.0	0.004	4.7	LOS A	0.0	0.1	0.17	0.48	0.17	46.3
East: Yass Street														
4	L2	1	0	1	0.0	0.036	4.6	LOS A	0.0	0.1	0.01	0.02	0.01	49.3
5	T1	54	15	57	27.8	0.036	0.0	LOS A	0.0	0.1	0.01	0.02	0.01	49.8
6	R2	1	0	1	0.0	0.036	4.7	LOS A	0.0	0.1	0.01	0.02	0.01	49.1
Approach		56	15	59	26.8	0.036	0.2	NA	0.0	0.1	0.01	0.02	0.01	49.8
North: Wombat Street														
7	L2	1	0	1	0.0	0.038	4.6	LOS A	0.1	1.0	0.24	0.53	0.24	46.1
8	T1	1	0	1	0.0	0.038	4.1	LOS A	0.1	1.0	0.24	0.53	0.24	46.3
9	R2	31	0	33	0.0	0.038	5.4	LOS A	0.1	1.0	0.24	0.53	0.24	45.9
Approach		33	0	35	0.0	0.038	5.3	LOS A	0.1	1.0	0.24	0.53	0.24	45.9
West: Yass Street														
10	L2	1	0	1	0.0	0.015	4.6	LOS A	0.0	0.0	0.00	0.02	0.00	49.4
11	T1	30	3	32	10.0	0.015	0.0	LOS A	0.1	0.5	0.03	0.08	0.03	49.4
12	R2	18	3	19	16.7	0.015	4.9	LOS A	0.1	0.5	0.16	0.41	0.16	46.2
Approach		49	6	52	12.2	0.015	1.9	NA	0.1	0.5	0.08	0.20	0.08	48.2
All Vehicles		143	21	151	14.7	0.038	2.1	NA	0.1	1.0	0.09	0.22	0.09	48.2

Table B1: Weekday Priority Intersection Performance of Yass Street with Wombat Street for the AM Peak Hour with Subdivision Traffic

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Wombat Street														
1	L2	1	0	1	0.0	0.003	4.7	LOS A	0.0	0.1	0.16	0.48	0.16	46.5
2	T1	1	0	1	0.0	0.003	4.1	LOS A	0.0	0.1	0.16	0.48	0.16	46.7
3	R2	1	0	1	0.0	0.003	5.2	LOS A	0.0	0.1	0.16	0.48	0.16	46.1
Approach		3	0	3	0.0	0.003	4.6	LOS A	0.0	0.1	0.16	0.48	0.16	46.4
East: Yass Street														
4	L2	3	0	3	0.0	0.024	4.6	LOS A	0.0	0.1	0.01	0.05	0.01	49.1
5	T1	36	5	38	13.9	0.024	0.0	LOS A	0.0	0.1	0.01	0.05	0.01	49.6
6	R2	1	0	1	0.0	0.024	4.9	LOS A	0.0	0.1	0.01	0.05	0.01	48.9
Approach		40	5	42	12.5	0.024	0.5	NA	0.0	0.1	0.01	0.05	0.01	49.6
North: Wombat Street														
7	L2	1	0	1	0.0	0.004	4.6	LOS A	0.0	0.1	0.10	0.50	0.10	46.5
8	T1	1	0	1	0.0	0.004	4.0	LOS A	0.0	0.1	0.10	0.50	0.10	46.7
9	R2	2	0	2	0.0	0.004	5.3	LOS A	0.0	0.1	0.10	0.50	0.10	46.3
Approach		4	0	4	0.0	0.004	4.8	LOS A	0.0	0.1	0.10	0.50	0.10	46.4
West: Yass Street														
10	L2	28	0	29	0.0	0.023	4.6	LOS A	0.0	0.0	0.00	0.37	0.00	47.4
11	T1	50	8	53	16.0	0.023	0.0	LOS A	0.0	0.1	0.01	0.12	0.01	49.3
12	R2	2	0	2	0.0	0.023	4.7	LOS A	0.0	0.1	0.01	0.03	0.01	48.8
Approach		80	8	84	10.0	0.023	1.7	NA	0.0	0.1	0.01	0.20	0.01	48.6
All Vehicles		127	13	134	10.2	0.024	1.5	NA	0.0	0.1	0.02	0.17	0.02	48.8

Table B2: Weekday Priority Intersection Performance of Yass Street with Wombat Street for the PM Peak Hour with Subdivision Traffic

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Boureong Drive														
2	T1	1	0	1	0.0	0.001	0.0	LOS A	0.0	0.0	0.02	0.28	0.02	48.4
3	R2	1	0	1	0.0	0.001	4.6	LOS A	0.0	0.0	0.02	0.28	0.02	47.5
Approach		2	0	2	0.0	0.001	2.3	NA	0.0	0.0	0.02	0.28	0.02	48.0
East: Ryan Place														
4	L2	8	0	8	0.0	0.006	4.6	LOS A	0.0	0.2	0.01	0.53	0.01	46.6
6	R2	1	0	1	0.0	0.006	4.6	LOS A	0.0	0.2	0.01	0.53	0.01	46.2
Approach		9	0	9	0.0	0.006	4.6	LOS A	0.0	0.2	0.01	0.53	0.01	46.6
North: Boureong Drive														
7	L2	1	0	1	0.0	0.001	4.6	LOS A	0.0	0.0	0.00	0.27	0.00	48.0
8	T1	1	0	1	0.0	0.001	0.0	LOS A	0.0	0.0	0.00	0.27	0.00	48.5
Approach		2	0	2	0.0	0.001	2.3	NA	0.0	0.0	0.00	0.27	0.00	48.3
All Vehicles		13	0	14	0.0	0.006	3.9	NA	0.0	0.2	0.01	0.45	0.01	47.0

Table B3: Weekday Priority Intersection Performance of Boureong Drive with Ryan Place for the AM Peak Hour with Subdivision Traffic

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Boureong Drive														
2	T1	2	0.0	2	0.0	0.006	0.0	LOS A	0.0	0.2	0.02	0.44	0.02	47.6
3	R2	8	0.0	8	0.0	0.006	4.6	LOS A	0.0	0.2	0.02	0.44	0.02	46.7
Approach		10	0.0	11	0.0	0.006	3.7	NA	0.0	0.2	0.02	0.44	0.02	46.9
East: Ryan Place														
4	L2	1	0.0	1	0.0	0.001	4.6	LOS A	0.0	0.0	0.01	0.54	0.01	46.6
6	R2	1	0.0	1	0.0	0.001	4.6	LOS A	0.0	0.0	0.01	0.54	0.01	46.2
Approach		2	0.0	2	0.0	0.001	4.6	LOS A	0.0	0.0	0.01	0.54	0.01	46.4
North: Boureong Drive														
7	L2	1	0.0	1	0.0	0.001	4.6	LOS A	0.0	0.0	0.00	0.27	0.00	48.0
8	T1	1	0.0	1	0.0	0.001	0.0	LOS A	0.0	0.0	0.00	0.27	0.00	48.5
Approach		2	0.0	2	0.0	0.001	2.3	NA	0.0	0.0	0.00	0.27	0.00	48.3
All Vehicles		14	0.0	15	0.0	0.006	3.6	NA	0.0	0.2	0.02	0.43	0.02	47.0

Table B4: Weekday Priority Intersection Performance of Boureong Drive with Ryan Place for the PM Peak Hour with Subdivision Traffic

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Yass Street														
5	T1	54	15	57	27.8	0.038	0.0	LOS A	0.0	0.3	0.03	0.05	0.03	49.6
6a	R1	6	0	6	0.0	0.038	3.7	LOS A	0.0	0.3	0.03	0.05	0.03	49.0
Approach		60	15	63	25.0	0.038	0.4	NA	0.0	0.3	0.03	0.05	0.03	49.5
NorthWest: Sands Street														
27a	L1	23	0	24	0.0	0.016	4.5	LOS A	0.1	0.4	0.11	0.52	0.11	46.0
29b	R3	1	0	1	0.0	0.016	5.5	LOS A	0.1	0.4	0.11	0.52	0.11	45.9
Approach		24	0	25	0.0	0.016	4.6	LOS A	0.1	0.4	0.11	0.52	0.11	46.0
West: Yass Street														
10b	L3	1	0	1	0.0	0.023	5.4	LOS A	0.0	0.0	0.00	0.02	0.00	49.8
11	T1	39	3	41	7.7	0.023	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	49.9
Approach		40	3	42	7.5	0.023	0.1	NA	0.0	0.0	0.00	0.02	0.00	49.9
All Vehicles		124	18	131	14.5	0.038	1.1	NA	0.1	0.4	0.03	0.13	0.03	48.9

Table B5: Weekday Priority Intersection Performance of Yass Street with Sands Street for the AM Peak Hour with Subdivision Traffic

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Yass Street														
5	T1	39	5	41	12.8	0.036	0.1	LOS A	0.1	0.9	0.08	0.18	0.08	48.8
6a	R1	23	0	24	0.0	0.036	3.7	LOS A	0.1	0.9	0.08	0.18	0.08	48.3
Approach		62	5	65	8.1	0.036	1.4	NA	0.1	0.9	0.08	0.18	0.08	48.6
NorthWest: Sands Street														
27a	L1	6	0	6	0.0	0.005	4.5	LOS A	0.0	0.1	0.10	0.53	0.10	46.0
29b	R3	1	0	1	0.0	0.005	5.5	LOS A	0.0	0.1	0.10	0.53	0.10	45.9
Approach		7	0	7	0.0	0.005	4.7	LOS A	0.0	0.1	0.10	0.53	0.10	46.0
West: Yass Street														
10b	L3	1	0	1	0.0	0.019	5.4	LOS A	0.0	0.0	0.00	0.02	0.00	49.8
11	T1	32	3	34	9.4	0.019	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	49.9
Approach		33	3	35	9.1	0.019	0.2	NA	0.0	0.0	0.00	0.02	0.00	49.9
All Vehicles		102	8	107	7.8	0.036	1.2	NA	0.1	0.9	0.05	0.15	0.05	48.8

Table B6: Weekday Priority Intersection Performance of Yass Street with Sands Street for the PM Peak Hour with Subdivision Traffic

Transport for NSW

12 September 2024

TfNSW reference: STH24/00318/002
Your reference: PP-2024-121 - REF-2828

Laterals Engineering and Management
By Email: robert@laterals.com.au
CC: council@upperlachlan.nsw.gov.au

Attention: Robert Mowle

PLANNING PROPOSAL – PP-2024-121 – REF-2828 – Rezone and Amendment of Lot Sizes
LOT: 4 DP: 1198749 – 18 Boureong Drive, GUNNING

Dear Robert

Transport for NSW (TfNSW) is responding to the additional information associated with the above Planning Proposal (PP), referred on 12 August 2024.

TfNSW has reviewed the information provided and has **no objections** to the PP. TfNSW's comments are detailed in **Attachment 1**.

If you have any questions, please contact Emilija Quinn, Development Services Case Officer, on (02) 4064 0106 or email development.south@transport.nsw.gov.au.

Yours faithfully

Nathan Boscaro
Team Leader, Development Services South

Level 1, 101 Crown St (PO Box 477 2520) Wollongong NSW 2500
193-195 Morgan Street (PO Box 484) Wagga Wagga NSW 2650
ABN 18 804 239 602
transport.nsw.gov.au

Transport for NSW

Attachment 1

PLANNING PROPOSAL – PP-2024-121 – REF-2828 – Rezone and Amendment of Lot Sizes
LOT: 4 DP: 1198749 – 18 Boureong Drive, GUNNING

Context

TfNSW notes for this Planning Proposal:

- The key state road is Hume Highway
- The site has access via Yass St, Collector Rd, Hume St and Gundaroo Rd. These roads are regional classified roads and are managed by Upper Lachlan Shire Council.
- The State road in this vicinity of the Hume Highway has grade separated access to Gunning from the south and north.
- The site is identified at RU4 Primary Production, minimum lot size 10ha.
- The PP proposes to rezone the site to RU5 Village, reducing the minimum lot size to 1,000m2 which will cater for a sixty (60) lot subdivision as outlined in **Attachment 2**.

Comments

- TfNSW has no current plans or funding to investigate, develop, and deliver road infrastructure upgrades along the Hume Highway at its existing connections with Gundaroo Road and Collector Road.
- Council will need to determine whether the access arrangements at the intersection of Yass Street (regional classified road) and Wombat Street (local road) are appropriate to cater for the PP.
- Council will need to determine if the proposed Best St and Sands St intersection are required for the PP.
- Council will need to be satisfied that the appropriate mechanisms are in place for the funding of any road network upgrades associated with the PP.
- Council needs to be satisfied that sufficient road place is allocated to facilitate a public school bus service and safe bus stop locations within the site.

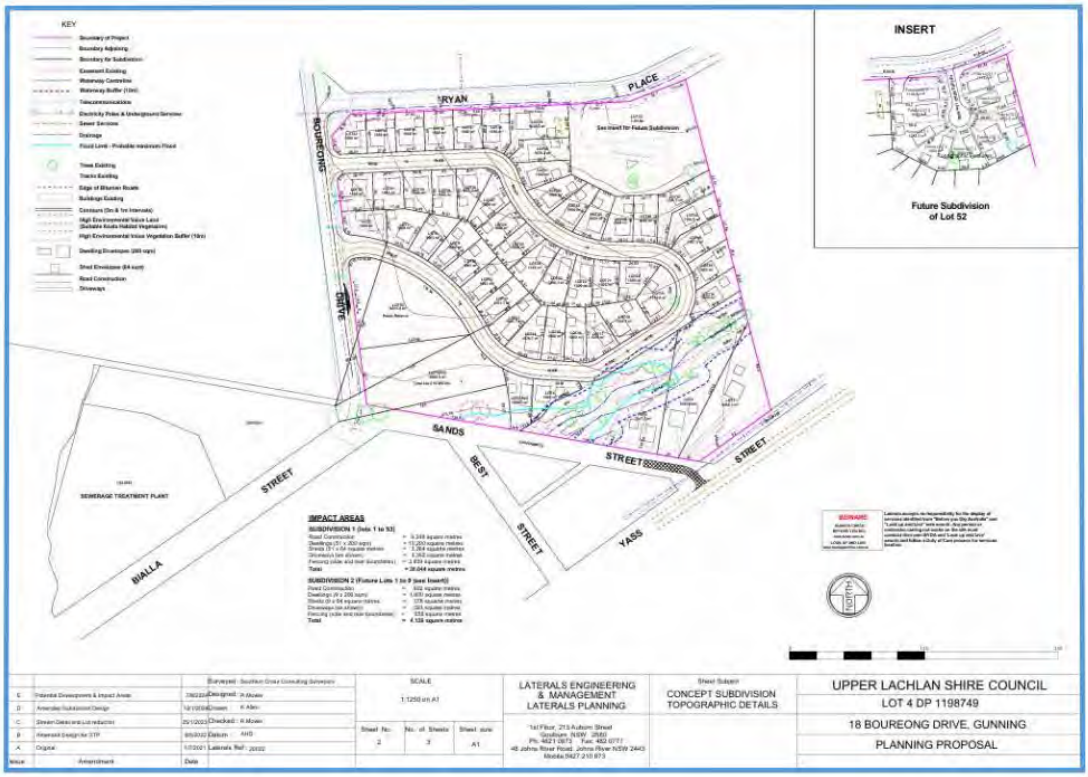
Transport for NSW

NSW GOVERNMENT

Attachment 2

PLANNING PROPOSAL – PP-2024-121 – REF-2828 – Rezone and Amendment of Lot Sizes
LOT: 4 DP: 1198749 – 18 Boureong Drive, GUNNING

Proposed Subdivision



Level 1, 101 Crown St (PO Box 477 2520) Wollongong NSW 2500
193-195 Morgan Street (PO Box 484) Wagga Wagga NSW 2650
ABN 18 804 239 602
transport.nsw.gov.au

Transport for NSW

15 May 2024

TfNSW reference: STH24/00318/001
Your reference: PP-2024-121 – REF-2828

Development Control Officer
Upper Lachlan Shire Council
By Email: kgranger@upperlachlan.nsw.gov.au
CC: council@upperlachlan.nsw.gov.au

Attention: Karinne Granger

PLANNING PROPOSAL – PP-2024-121 – REF-2828 – Rezone and Amendment of Lot Sizes
LOT: 4 DP: 1198749 – 18 Boureong Drive, GUNNING

Dear Karinne

Transport for NSW (TfNSW) is responding to the Planning Proposal 2024-121 referred on 17 April 2024.

TfNSW has reviewed the information and is unable to properly assess possible impacts of the proposed development on the State road network and its users. Details of **additional required information** are set out in **Attachment 1**.

If you have any questions, please contact Emilija Quinn, Development Services Case Officer, on (02) 4064 0106 or email development.south@transport.nsw.gov.au.

Yours faithfully

Emilija Quinn
Development Case Officer
Development Services South

Transport for NSW

NSW GOVERNMENT

Attachment 1

PLANNING PROPOSAL – PP-2024-121 – REF-2828 – Rezone and Amendment of Lot Sizes – LOT: 4 DP: 1198749 – 18 Boureong Drive, GUNNING

Context

TfNSW notes for this Planning Proposal:

- The key state road is Hume Highway
- The site has access via Yass St, Collector Rd Hume St and Gundaroo Rd. These roads are regional classified roads and are managed by Goulbourn Mulwaree Council (GMC)
- The state roads in this vicinity of the Hume Highway have grade separated access to Gunning from the south and north
- Council is seeking comments from TfNSW and other agencies
- The site is identified at RU4 Primary Production, minimum lot size 10ha
- The proposal proposes to rezone and amend the lots sizes to RU5 Village zone, reducing the minimum lot size to 1,000m2
- According to **Attachment 2**, Concept Subdivision Plan, there appears to be Sixty two (62) lots, minimum lot size proposed is 1000.9 m^2 - largest 8908.9 9 m^2

Additional required information

As per TfNSW correspondence dated 20 April 2022, (Ref: STH22/00097/01) TfNSW requires the following additional information to assess the proposed development:

Traffic Impact Study (TIS)

- A TIS is required to examine any potential transport related implications of the Planning proposal. As a guide Table 2.1 of the RTA's Guide to Traffic Generating Developments outlines the key issues that should be considered in preparing a TIS. The traffic study needs to include, but not be limited to:
    - Details on the potential number of lots, associated trip generation, trip distribution, etc.
    - Identification of appropriate bus facilities to cater for existing demands and/or increase the attractiveness of public transport.
    - If applicable, consideration of the impacts to the state road network and identification of appropriate measures to mitigate the impact.

Additional comments

TfNSW provides the following comments:

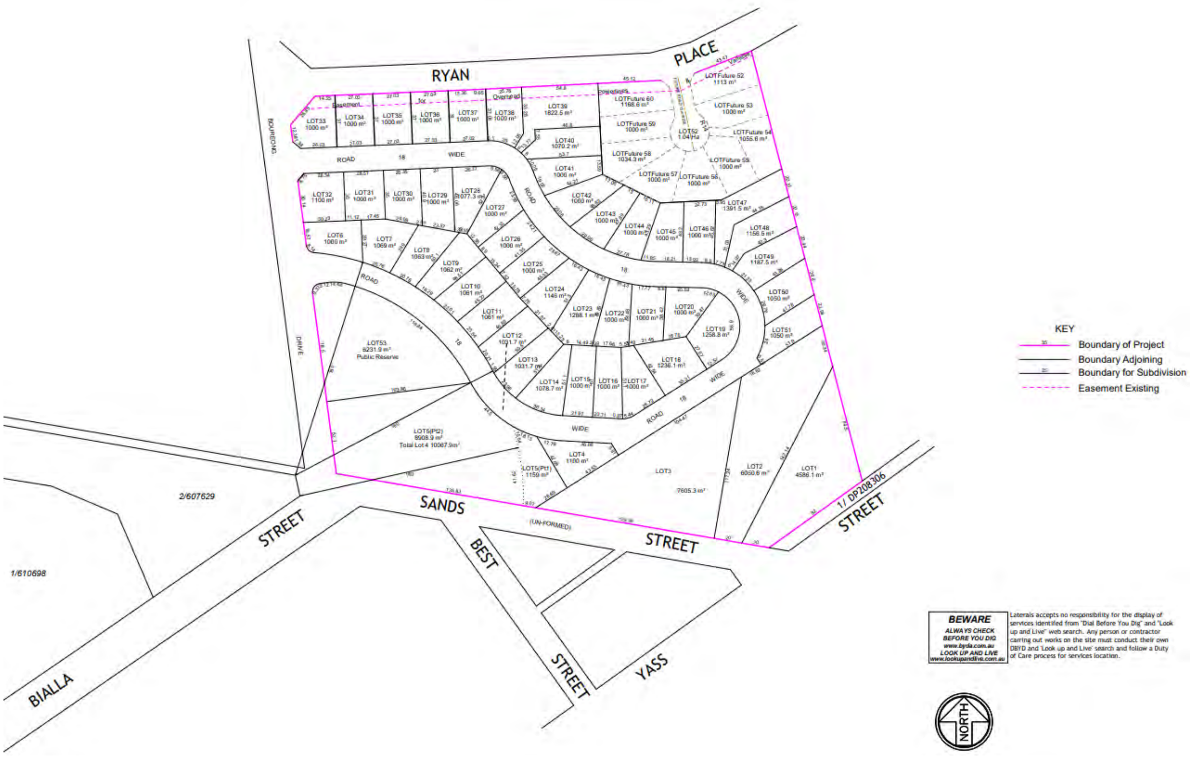
- TfNSW has no current plans or funding to investigate, develop, and deliver road infrastructure upgrades along the Hume Highway at its existing connections with Gundaroo Road and Collector Road
- Council will need to determine whether the access arrangements at the intersection of Yass Street (regional classified road) and Wombat Street (local road) are appropriate to cater for the Proposal.
- Council needs to be satisfied that sufficient road place is allocated to facilitate a public-school bus service and safe bus stop locations.

Transport for NSW

NSW GOVERNMENT

Attachment 2

PLANNING PROPOSAL – PP-2024-121 – REF-2828 – Rezone and Amendment of Lot Sizes – LOT: 4 DP: 1198749 – 18 Boureong Drive, GUNNING



Our Ref: ID2739
Your Ref:

7 November 2024

Robert Mowle
213 Auburn Street
GOULBURN NSW 2580

Via email

email: robert@lateralsglp.com.au
CC: dylan.whitelaw1@ses.nsw.gov.au

Dear Robert,

Flood Impact and Risk Assessment (FIRA) for 18 Boureong Drive, Gunning

Thank you for the opportunity to provide comment on the Flood Impact and Risk Assessment (FIRA) for the proposed development at 18 Boureong Drive, Gunning. It is understood that FIRA relates to a planning proposal to amend the Upper Lachlan Local Environmental Plan 2010 by changing the zoning from RU4 Primary Production Small Lots to RU5 Village and reducing the minimum lot size from 10Ha to 1000m^2. This would allow for 51 dwellings on the site.

The NSW State Emergency Service (NSW SES) is the agency responsible for dealing with floods, storms and tsunami in NSW. This role includes, planning for, responding to and coordinating the initial recovery from floods. As such, the NSW SES has an interest in the public safety aspects of the development of flood prone land, particularly the potential for changes to land use to either exacerbate existing flood risk or create new flood risk for communities in NSW.

It is the preference of NSW SES that all development follows the application of sound land use planning and flood risk management in accordance with the Flood Prone Land Policy, the Flood Risk Management Manual 2023 (the Manual) and supporting guidelines.

We refer to our previous advice dated 15 May 2024 and 12 April 2022 and provide the following additional advice based on the principles outlined in the EM01 Support for Emergency Management Guidelines.

In summary, we:

- **Appreciate** the incorporation of previous advice provided by NSW SES, including the consideration of frequency, duration and timing of flooding within the FIRA[1] and note that the site is a high flood island in extreme events.

[1] Catchment Simulation Solutions. October 2024. 18 Boureong Drive, Gunning: Flood Impact Risk Assessment

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www.ses.nsw.gov.au
ABN: 88 712 649 015

- **Note** that a flood emergency plan will be prepared to improve awareness rather than management of flood risk. We encourage this plan to be regularly exercised, similar to building fire evacuation drills, however note that this will be difficult post-consent. The FERP should be updated at regular intervals and whenever additional flood information is available or highlighted during the drills or flood events.
- **Recommend** pursuing the south-eastern access / egress road (Sands Street) to avoid the need for Lots 1, 2 and 3 to enter the watercourse[2].
- **Support** the proposed buffer surrounding the watercourse, excluding development from areas at risk of flooding[3].
- **Recommend** seeking advice from the Department of Climate Change, Energy, the Environment and Water (DCCEEW).

You may also find the following Guidelines, originally developed for the Hawkesbury Nepean Valley and available on the NSW SES website useful:

- Reducing Vulnerability of Buildings to Flood Damage
- Designing Safer Subdivisions
- Managing Flood Risk Through Planning Opportunities

Please feel free to contact Gillian Webber via email at rra@ses.nsw.gov.au should you wish to discuss any of the matters raised in this correspondence. The NSW SES would also be interested in receiving future correspondence regarding the outcome of this referral via this email address.

Yours sincerely,

Elspeth O'Shannessy
Manager Emergency Risk Assessment
NSW State Emergency Service

[2] Catchment Simulation Solutions. October 2024. 18 Boureong Drive, Gunning: Flood Impact Risk Assessment, p59 and 60
[3] Catchment Simulation Solutions. October 2024. 18 Boureong Drive, Gunning: Flood Impact Risk Assessment, p59 and 60

Department of Climate Change, Energy, the Environment and Water

Your ref: PP-2024-121
Our ref: DOC24/347565-1

Ms Karinne Granger
Development Control Officer
Upper Lachlan Shire Council
PO Box 42
GUNNING NSW 2581

By email: kgranger@upperlachlan.nsw.gov.au

Dear Ms Granger,

Subject: Planning Proposal – Gunning Heights Estate - 18 Boureong Drive, Gunning – Upper Lachlan Shire

Biodiversity, Conservation and Science, Regional Delivery (BCS) have reviewed the Planning Proposal for 18 Boureong Drive, including the Biodiversity Assessment completed by Macrozemia Environmental Consulting. BCRD is of the opinion that the proposal does not demonstrate adequate consideration of the recommendations in our review of the previous iteration of this proposal dated 26/04/2022.

We have concluded that there is insufficient information in the documents to adequately address the following ministerial local planning directions that are required in a planning proposal:

- **Direction 1.1 – Implementation of Regional Plans**
- **Direction 3.1 – Conservation Zones**
- **Direction 4.1 – Flooding**

Further comments regarding biodiversity are included in **Attachment A**, and further comments regarding flooding are included in **Attachment B**.

If you have any further questions about this issue, please contact Mr Louis Cameron, Assistant Regional Operations Support Officer, Biodiversity and Conservation Division, at rog.southeast@environment.nsw.gov.au

Yours sincerely

ALLISON TREWEEK
Senior Team Leader Planning
Biodiversity and Conservation Regional Delivery

10 May 2024

11 Farrer Place Queanbeyan NSW 2620 | PO Box 733 | dcceew.nsw.gov.au

ATTACHMENT A – Biodiversity comments

While it is stated that there are minimal biodiversity values at the site, the assessment does not include sufficient information to support this. In addition, the Biodiversity Assessment is over 3 years old and needs to be updated. BCS does not consider that the information provided sufficiently quantifies the potential biodiversity impacts and therefore cannot determine if the proposal meets Ministerial Directions 1.1 and 3.1.

We note that we previously completed a review of this Biodiversity Assessment on 26/04/2022. This review highlighted several potential biodiversity issues that had not been addressed by the assessment, including:

- Presence of Golden Sun Moth (GSM) habitat
- Presence of Derived Native Grassland (DNG) from *PCT 1330 Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion*, and
- Presence of other threatened grassland reptiles, such as Striped Legless Lizard and Pink-tailed Worm Lizard

These issues remain unaddressed by the proposal.

BCS recommend that an assessment of biodiversity values is carried out consistent with Stage 1 of the Biodiversity Assessment Method (BAM) or similar methodology, to inform the planning proposal and demonstrate consistency with the ministerial local planning directions. This needs to include groundcover, as previously grazed areas can contain significant proportions of native species. Groundcover as well as overstorey is covered by the *Biodiversity Conservation Act 2016* (BC Act).

BCS also require a clear development footprint, or area of impact, from the proposed development. Planning Proposals must be assessed having regard to all clearing associated with the final use of the land as intended in future subdivisions.

Ministerial Planning Direction 1.1 Implementation of Regional Plans/Direction 14 of Regional Plan

Direction 1.1 requires that planning proposals be consistent with a Regional Plan. The current South East and Tablelands Regional Plan 2036, specifically, Direction 14 – Protect important environmental assets, requires that validated High Environmental Value (HEV) land be protected in Local Environmental Plans (LEPs). The proposal has not addressed this direction.

As there is currently little information provided on the biodiversity values of the site in the proposal, it is currently unlikely that consistency with this direction can be demonstrated without further evidence being provided.

Application of the avoid, minimise and offset hierarchy should also be demonstrated when addressing this direction. Areas that have HEV will need to be avoided from impact in the first instance, and the planning proposal should demonstrate how these areas will be protected. There may be areas of threatened species habitat that will be impacted by the development, which have not been adequately identified or assessed.

Ministerial Planning Direction 3.1 Conservation Zones

Direction 3.1 requires that a planning proposal must include provisions that facilitate the protection and conservation of environmentally sensitive areas. As with direction 1.1 above, an assessment should be provided to adequately identify whether there are environmentally sensitive areas or areas of high environmental value that need to be protected.

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ATTACHMENT B – Flooding comments

Ministerial Planning Direction 4.1 Flooding

Comments provided by our Water, Floodplains and Coast team on 26/04/2022 have not been adequately addressed in the proposal. It was noted that a flooding investigation had not been provided to demonstrate consistency with the *Section 9.1(2) Direction 4.1* of the Local Planning Direction. Comment provided on p.26 of the Planning Proposal produced by Laterals Planning (January 2024) does not adequately justify the lack of such an investigation.

The proposal has also not addressed the issues associated with proposed zoning of riparian lands and lands within the Flood Planning Area noted in our previous advice. The proposed approach is therefore in contradiction with requirements of the Direction and should be resolved at the rezoning stage.

The proposal seeks to rezone land that is flood prone and therefore will need to demonstrate consistency with *Section 9.1(2) Direction 4.1* of the Local Planning Direction, the NSW Government's Flood Prone Land Policy and the Flood Risk Management Manual, 2023. The planning proposal should be supported by a Flood Impact and Risk Assessment (FIRA) to address the requirements of the local planning direction over the range of floods up to the Probable Maximum Flood (PMF) and issues relating to flood risk, impacts and public safety.

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Laterals
Planning
Engineering & Management
Environmental

Water Directorate STP Buffer Zone Land Use Planning Guidelines
18 Boureong Road, Gunning - Lot 4 DP 1198749
Additional Information

SLR Consulting Australia Pty Ltd have been requested to respond to the matters contained in Council's letter dated 3 April 2023; viz:

> *The applicant provides further supporting documentation to address the STP buffer zone based on the NSW Water Directorate STP Buffer Zone Land Use Planning guidelines;*

A copy of the advice received from SLR Consulting is included at Attachment 3 at page 10 and includes the following statements:

> *As you are aware, SLR has previously prepared an adverse amenity impact assessment (AAIA) for Lot 4 considering the potential for odour impacts associated with GSTP (SLR Report 610.30375-R01-v2.0-20210602). The AAIA was developed as a site-specific study taking conservative account of:*
>
> - *potential odour sources from GSTP*
> - *locations and characteristics of the odour sources*
> - *locations of sensitive receptors (i.e. existing residences and Lot 4)*
> - *weather conditions, including predominant wind directions*
> - *site features that may affect odour propagation and dispersion*
> - *the likely risk of odour impacts with consideration of:*
>   - *the relatively small scale (capacity) of GSTP (and therefore the associated small scale of odour emissions)*
>   - *the separation distance between GSTP and Lot 4 in comparison to published minimum recommended buffer distances between waste water treatment plants and sensitive land uses.*
>   - *the prevailing wind conditions, in particular the frequency of wind directions that would be required to transport odour from GSTP to Lot 4, but also the frequency of wind directions that would transport odour to the existing nearby sensitive receptors (residences) without apparent concern.*
>
> *Being a site-specific assessment, incorporating contingency for a population of 1,000 potentially-affected residents, SLR considers a 160 m separation distance for GSTP to be appropriate. This contrasts with NSW Water Directorate's recommended STP buffer of 400 m, which can be considered a blanket distance, chosen to be conservative with no consideration of the elements listed above.*
>
> And
>
> *SLR does not consider a 400 m buffer distance to be appropriate in this situation, and indeed believes that imposing such a buffer will unnecessarily sterilise a large area of as yet unrealised land.*

The Water Directorate STP Buffer Zone Land Use Planning Guidelines (June 2020) states that:

> *In light of the variability of STP conditions and characteristics, it is recognised that a rigid approach to buffer zone planning is not appropriate. Each STP and surrounding environment needs to be assessed individually for effective and appropriate land use to be achieved.* (Cl.2.1)

The Guidelines also indicate that the 400m buffer distance originates from the former Department of Planning's *Circular No. E3 – Guidelines for Buffer Areas Around Sewage Treatment (Water Pollution Control) Plants*, March 1989, being a general policy on buffer areas and a strategic tool to broadly guide land use planners in considering public health and amenity issues relating to sewage treatment plants and to avoid inappropriate land use planning. The circular states that:

> *The circular recommends a minimum buffer distance of 400 metres, while recognising that this may vary according to local conditions.* (Cl.3.1.1)

This is precisely the approach taken by the SLR Consulting assessment reports.

The Guidelines also indicate that the EPA has produced a technical framework for assessing and managing odour from stationary sources in NSW (Cl.3.1.1). This was addressed by SLR Consulting in a letter to the EPA dated 31 May 2022 – copy at Attachment 2 at page 6.

The Guidelines also state that:

> *Most guidelines address the need for a prescriptive approach but remain flexible. This allows a merit based approach that in some circumstances, depending on local factors, the facility and types of uses, can allow some sensitive uses within buffer zones. This is important in achieving the economic development of land and is consistent with merit-based approaches to land-use decisions favoured by the NSW Government.* (Cl.3.1.2)

Thia also reflects the approach taken by SLR Consulting.

The Guidelines further emphasise that:

> *Each STP location has unique features such as topography, vegetation and meteorological conditions that have the potential to significantly influence the severity of many of the environmental impacts described in the previous section. Consideration of these local factors is of key importance when considering the appropriateness (or otherwise) or surrounding land uses. The unique features mentioned above may have an impact to the extent that one side of an STP is totally appropriate for a particular land use while the other side of the STP is completely inappropriate.* (Cl.6)

The Guidelines also provide a preliminary risk based assessment in respect to STP buffer zone land use options (Section 8) and a completed assessment is attached – see Attachment 1 at pages 4 and 5. The assessment indicates that the proposed residential development is a likely use within the 400m buffer.

There are also several other reasons why the NSW Water Directorate sewer treatment plant buffer distance does not necessarily apply to residential development:

1. **Advanced treatment technologies**: Sewer treatment plants often incorporate treatment technologies that effectively remove or significantly reduce harmful contaminants from wastewater. These technologies can include processes such as disinfection, filtration, and nutrient removal, ensuring that the treated effluent meets strict water quality standards. With such treatments in place, the need for large blanket buffer distances are not appropriate.
2. **Land and urban planning**: Strict buffer distances around sewer treatment plants can limit residential development options.
3. **Comprehensive planning and risk assessment**: Instead of enforcing fixed buffer distances uniformly, a more effective approach involves a site-specific assessment. By evaluating factors such as the specific treatment plant design, treatment processes, and the topography of the surrounding area, it is possible to determine appropriate setback distances on a case-by-case basis. This approach ensures that residential development can proceed in a manner that is compatible with the existing infrastructure and minimizes potential risks.
4. **Consideration of local conditions and regulations**: Local conditions, including the size and capacity of the sewer treatment plant, the local climate, and the characteristics of the surrounding area, should be taken into account when determining buffer distances. Flexibility

in applying buffer distances allows for a more context-specific and tailored approach to residential development.

In respect to the possible expansion of the Gunning STP it is noted that the facility was constructed in 1976 and has sufficient capacity for this proposed development but expansion of the facility will be required in the future. This aspect was recognised by the proponents by incorporating a 250m buffer from the existing facility (Lot 1 DP 610698) in lieu of the SLR Consulting recommended buffer of 160m. The proponents have no objection to the SLR Consulting recommended buffer distance of 160m commencing from the boundary of Lot 2 DP 607629. Future expansion of the facility will undoubtedly incorporate new treatment technologies to minimise any impact on the Gunning community. The Draft NSW Best Practice Odour Guideline (April 2010) includes the statement "*Odour modelling during the strategic assessment stage will assist to inform the processes of boundary location*". (Section 2.2.1). This is precisely what the proponents have undertaken.

It is noted that the Upper Lachlan Shire Draft Housing Strategy (September 2021) seeks to enhance the growth of Gunning as a commuting town. The Strategy also states that:

> *While there is ample land for residential development in all of the villages, a major roadblock to residential development voiced by the community, particularly in Gunning and Collector, was that the LEP minimum lot sizes were too large.*
>
> *The majority of lots in Gunning are below the minimum lot size of 1,000sqm in the village zone which creates issues for redevelopment. Another issue in Gunning is the number of areas in a single ownership in the town centre that have not been developed in recent years.*

The proposed Planning Proposal provides an opportunity for the implementation of Council's Housing Strategy being adjacent to the existing urban area of Gunning which is unaffected by flooding and the site-specific odour assessment undertaken by SLR Consulting stating a buffer distance of 160m which can be implemented from the boundary of Lot 2 DP 607629 will minimise any impact from the Gunning STP.

ATTACHMENT 1 – WATER DIRECTORATE BUFFER ZONE RISK ASSESSMENT

1/2
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WATER DIRECTORATE | STP BUFFER ZONE LAND USE PLANNING GUIDELINES

APPENDIX A

STP Buffer Zone Land Use Options – Risk Assessment Guideline Sheets

Step 1

Specify Land Use	Residential	(a)
Specify STP Size	Small	(b)
Specify STP Type	Mechanical	(c)

Step 2 For answer in (a), select appropriate values for **Impact Sensitivity** from Table 3

A	Odour	3
B	Aerosol	2
C	Noise and vibrations	2
D	Soil and groundwater contamination	2
E	Visual impact	2
F	Lighting	2

Step 3 For answer in (b) and (c), select appropriate values for **Impact Potential** from Table 4

A	Odour	3
B	Aerosol	1
C	Noise and vibrations	1
D	Soil and groundwater contamination	1
E	Visual impact	1
F	Lighting	1

Step 4 Determine **Overall Mitigation Factor** values according to Section 8.4

A	0.75	–	–	–	–	0.75
B	–	–	–	–	–	1.0
C	0.75	0.75	–	–	–	0.56
D	–	–	–	–	–	1
E	–	–	–	–	–	1
F	–	–	–	–	–	1

TECHNICAL GUIDELINES Page 46 June 2020

4

2/2

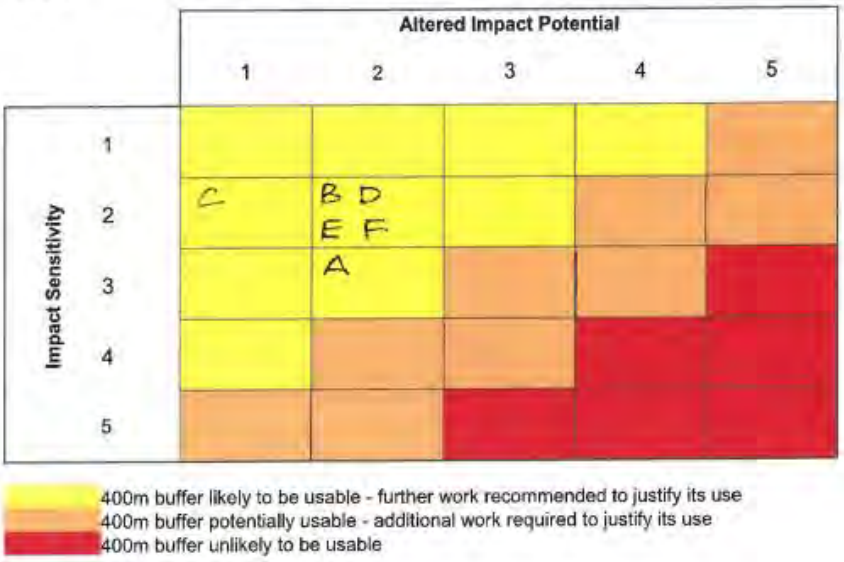
WATER DIRECTORATE

STP BUFFER ZONE LAND USE PLANNING GUIDELINES

Step 5 Determine **Altered Impact Potential** by multiplying the results from Step 3 by the results from Step 4

A	3	×	0.75	=	2
B	2	×	1.0	=	2
C	2	×	0.56	=	1
D	2	×	1.0	=	2
E	2	×	1.0	=	2
F	2	×	1.0	=	2

Step 6 Use results from Step 2 and Step 5 to mark up the Risk Matrix



400m buffer likely to be usable - further work recommended to justify its use
400m buffer potentially usable - additional work required to justify its use
400m buffer unlikely to be usable

TECHNICAL GUIDELINES

Page 47
June 2020

5

ATTACHMENT 2 – SLR LETTER TO EPA DATED 31 MAY 2022

31 May 2022

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NSW EPA
Unit Head
Regulatory Operations Regional
Email: epa.southopsregional@epa.nsw.gov.au

Attention: Janine Goodwin

Dear Janine

Gunning Lot 4 DP 1198749
Response to EPA Advice (DOC22/308502)

I refer to your letter to Ms Siobhan Scott Nielson (22 April 2022) regarding the planning proposal for rezoning of Lot 4 DP 1198749 (the Site) from Rural Small Holdings RU4 to Rural Village RU5 and your concerns regarding the proximity of the Lot to Gunning Sewage Treatment Plant (GSTP) and Gunning Landfill. In particular, you state that your concerns relate to the potential for odour and noise emissions associated these facilities adversely impacting the Site and proffer consideration of EPA NSW document "*Technical Framework – Assessment and management of odour from stations sources in NSW*" (the Technical Framework).

SLR have previously prepared an odour amenity impact assessment (OAIA) for Lot 4 considering the potential for odour impacts associated with GSTP that we consider covers the relevant aspects of the Technical Framework including the likelihood of land-use conflict. We acknowledge the oversight in not including the Technical Framework, and the *Technical Notes: Assessment and management of odour from stationary sources in NSW* in the list of relevant standards and guidelines in Section 1 of the report, however the approach used addresses the content of these documents, as presented below.

Firstly however, regarding Gunning Landfill, it is our understanding that this site has not been operating as a landfill since 2017 and is now a relatively small waste transfer station consisting of a gravelled area on which several skip bins are available to accept waste and recyclables from the public (refer **Figure 1**). We note that this facility is approximately 2.9 km west of Lot 4, on the other side of the existing residences of Gunning (refer **Figure 2**), and therefore consider it to pose no risk of adverse odour (or noise) impacts at Lot 4.

Secondly, in consideration of noise from GSTP, previous noise impact assessments undertaken for other development sites located in closer proximity to GSTP than Lot 4 (i.e. 70 – 80 m separation) found that while noise from GSTP was audible at 70 m and at 80 m, levels were observed to comply with the lowest possible noise limits at all times (including at night). It follows then, that with at least 160 m separation from GSTP, the levels at the Site would also comply with these criteria and therefore noise amenity would not be adversely affected. On this basis, SLR does not consider there to be any concerns with regard to the noise amenity at Lot 4 resulting from GSTP activity.

With regard to the potential for adverse odour impacts at Lot 4 resulting from GSTP operations, SLR's OAIA includes several relevant considerations in-line with the Technical Framework's guidance, noting that in general, the Technical Framework approaches the interface of a facility and sensitive land use from the facility's perspective, and therefore many of its considerations are not applicable here.

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With regard to GSTP, an existing activity, we note that Section 1.6 of the Technical Framework, *Odour criteria for existing activities*, states:

> *Once a facility is operational the benchmark for the facility is no longer the odour assessment criteria but whether the emission of odour is:*
>
> - *'offensive' (for scheduled activities), or*
> - *being prevented or minimised using best management practices (for scheduled and non-scheduled activities).*

SLR is not aware of any existing ongoing nuisance issues associated with odour from the existing GSTP activities. This apparent absence of odour-related complaints from the existing residential areas indicates that the facility is achieving acceptable performance with regard to odour emissions. SLR considers that the emission of odour (intensity and character) is not offensive at the distances that existing sensitive receptors are located, as would be expected for a facility of this size, noting that these receptors are both closer and (as discussed in our assessment), downwind of the facility for a significantly greater proportion of the time than the Site proposed for land use change.

Section 4 of the Technical Framework sets out three levels of assessment:

- Level 1 – screening level technique based on generic parameters for the type of activity and site (only available for broiler chicken farms, piggeries and cattle feedlots)
- Level 2 – screening modelling assessment
- Level 3 – refined modelling assessment

As noted above, there are no Level 1 screening techniques available in the Technical Framework for STPs. Performing a Level 2 (or 3) modelling assessment requires detailed design and operational information for the STP to provide a reliable assessment, and would only be warranted if there was a reasonable risk of nuisance impacts. SLR's OAIA therefore presents a qualitative assessment of odour risks, which concluded that the risk was very low and therefore a more detailed assessment is not required.

In line with the Technical Framework Section 6.2 *Odour impact Assessment check list*, SLR's OAIA includes consideration of:

- potential odour sources from GSTP
- locations and characteristics of the odour sources
- locations of sensitive receptors (i.e. existing residences and Lot 4)
- weather conditions, including predominant wind directions
- site features that may affect odour propagation and dispersion, including topography
- the likely risk of odour impacts with consideration of:
  - the relatively small scale (capacity) of GSTP (and therefore the associated relatively small scale of odour emissions)
  - the separation distance between GSTP and Lot 4 in comparison to published minimum recommended buffer distances between waste water treatment plants and sensitive land uses.

- the prevailing wind conditions, in particular the frequency of wind directions that would be required to transport odour from GSTP to Lot 4, but also the frequency of wind directions that would transport odour to existing nearby sensitive receptors (residences) without apparent concern.

Note also that the Technical Framework Section 5.5 *Managing odour in the pathway* proposes the "Purchase or long-term leasing of neighbouring properties provides a secure buffer zone around a facility and increases the separation distance between the site of the odour emissions and existing (or potential) sensitive receptors." In addition, Section 5.4 *Managing odour at the source* describes locating "odour-generating activities taking account of topography and property boundary to maximise the 'on-site buffer' between the odour generating activities and the boundary and receptors." The OAIA considered the buffer distance between odour emissions sources and the potential sensitive receptors of Lot 4 and concluded that it is adequate to mitigate the risk of odour impacts (equal to or greater than the relevant recommended minimum separation distance of 160 m). It is our understanding that the southwest of the Site is now to include an area to be used for access and passive recreation, effectively creating a buffer area such that the separation between GSTP and Site residences will be at least 250 m.

In addition, SLR's OAIA considers known complaints history for existing sensitive receptors. While SLR was unable to determine the existence of any complaints held by Council, the OAIA notes that during previous similar studies in Gunning, anecdotal advice was obtained that there was no significant history of odour nuisance in the area.

In summary, SLR considers the OAIA for Lot 4 adequate to demonstrate low risk of land-use conflict due to the following:

- the small scale and odour potential of GSTP
- the separation distance to residences within Lot 4 being greater than the relevant recommended separation distances
- the low frequency of wind directions required to promote odour transport from GSTP to Lot 4
- the apparent absence of odour nuisance at sensitive receptors closer (and in several cases, within the recommended separation distance) to GSTP and in directions experiencing higher frequencies of wind directions required to promote odour transport from GSTP.

SLR considers that the OAIA meets the intent of the relevant aspects of the Technical Framework and that the qualitative low-risk outcome indicates that a more detailed assessment (e.g. predictive modelling) is not warranted.

Yours sincerely

JASON SHEPHERD
Principal, Air Quality

Checked/
Authorised by: KL

Figure 1 Gunning Waste Transfer Station

Source: https://www.upperlachlan.nsw.gov.au/news/gunning-waste-facility-become-waste-transfer-station

Figure 2 Gunning Waste Transfer Station Location

Source: Nearmap.com

ATTACHMENT 3 – SLR LETTER TO ULSC DATED 25 MAY 2023

25 May 2023

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Upper Lachlan Shire Council
General Manager
PO Box 42
Gunning NSW 2581

Attention: Simon Arkinstall

Dear Simon

Gunning Lot 4 DP 1198749
Response to Advice 3 April 2023

I refer to your letter to Mr Robert Mowie, (3 April 2023) regarding the planning proposal for Lot 4 DP1198749, 18 Boureong Street (the Site) and your concerns regarding the proximity of the Lot to Gunning Sewage Treatment Plant (GSTP). In particular, you state that Council resolved as follows:

1. *Council not support the amendments to the Local Strategic Planning Statement until:*
   - *The applicant provides further supporting documentation to address the STP buffer zone based on the NSW Water Directorate STP Buffer Zone Land Use Planning guidelines; and*
   - *The additional information be forward to the relevant Government Agency for consideration and comment.*
2. *A further report be provided to Council for consideration to amend the Local Strategic Planning Statement on completion of the above actions.*

In addition, you advise that Council has requested that the buffer zone commence from the boundary of Lot 2 DP607629, and not Lot 1 DP610698, to allow for potential future expansion of GSTP.

As you are aware, SLR has previously prepared an adverse amenity impact assessment (AAIA) for Lot 4 considering the potential for odour impacts associated with GSTP (SLR Report 610.30375-R01-v2.0-20210602). The AAIA was developed as a site-specific study taking conservative account of:

- potential odour sources from GSTP
- locations and characteristics of the odour sources
- locations of sensitive receptors (i.e. existing residences and Lot 4)
- weather conditions, including predominant wind directions
- site features that may affect odour propagation and dispersion
- the likely risk of odour impacts with consideration of:
  - the relatively small scale (capacity) of GSTP (and therefore the associated small scale of odour emissions)
  - the separation distance between GSTP and Lot 4 in comparison to published minimum recommended buffer distances between waste water treatment plants and sensitive land uses.

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- the prevailing wind conditions, in particular the frequency of wind directions that would be required to transport odour from GSTP to Lot 4, but also the frequency of wind directions that would transport odour to the existing nearby sensitive receptors (residences) without apparent concern.

Being a site-specific assessment, incorporating contingency for a population of 1,000 potentially-affected residents, SLR considers a 160 m separation distance for GSTP to be appropriate. This contrasts with NSW Water Directorate's recommended STP buffer of 400 m, which can be considered a blanket distance, chosen to be conservative with no consideration of the elements listed above.

As presented in **Figure 1**, attached, a 400 m buffer would encompass existing residences. SLR is not aware of any existing ongoing nuisance issues associated with odour from the existing GSTP activities. This absence of odour-related complaints from the existing residential areas indicates that the facility is achieving acceptable performance with regard to odour emissions. SLR considers that the emission of odour (intensity and character) is not offensive at the distances that existing sensitive receptors are located, as would be expected for a facility of this size, noting that these receptors are both closer to and (as discussed in our 2021 assessment report), downwind of the facility for a significantly greater proportion of the time than the Site. SLR does not consider a 400 m buffer distance to be appropriate in this situation, and indeed believes that imposing such a buffer will unnecessarily sterilise a large area of as yet unrealised land.

In response to Council's request that the buffer zone commence from the boundary of Lot 2 DP607629, a 160 m buffer conservatively assumed to extend from the perimeter of Lot 2 is presented in **Figure 2**, attached. Note this is conservative as it assumes that the activity boundary is the same as the Lot 2 boundary. This is unlikely to be the case, with any new pondage systems likely to be set in from the site boundary. Nevertheless, this conservative buffer leaves the majority of the Site available for subdivision, for which amendments to the Local Strategic Planning Statement are now sought.

Yours sincerely

JASON SHEPHERD
Principal, Air Quality

Checked/
Authorised by: KL

Figure 1 Existing GSTP Activity Area: 160 m and 400 m Buffers

Figure 2 Potential Future GSTP Activity Area: 160 m Buffer and 400 m Buffers

25 May 2023

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Upper Lachlan Shire Council
General Manager
PO Box 42
Gunning NSW 2581

Attention: Simon Arkinstall

Dear Simon

Gunning Lot 4 DP 1198749
Response to Advice 3 April 2023

I refer to your letter to Mr Robert Mowie, (3 April 2023) regarding the planning proposal for Lot 4 DP1198749, 18 Boureong Street (the Site) and your concerns regarding the proximity of the Lot to Gunning Sewage Treatment Plant (GSTP). In particular, you state that Council resolved as follows:

1. *Council not support the amendments to the Local Strategic Planning Statement until:*
   - *The applicant provides further supporting documentation to address the STP buffer zone based on the NSW Water Directorate STP Buffer Zone Land Use Planning guidelines; and*
   - *The additional information be forward to the relevant Government Agency for consideration and comment.*
2. *A further report be provided to Council for consideration to amend the Local Strategic Planning Statement on completion of the above actions.*

In addition, you advise that Council has requested that the buffer zone commence from the boundary of Lot 2 DP607629, and not Lot 1 DP610698, to allow for potential future expansion of GSTP.

As you are aware, SLR has previously prepared an adverse amenity impact assessment (AAIA) for Lot 4 considering the potential for odour impacts associated with GSTP (SLR Report 610.30375-R01-v2.0-20210602). The AAIA was developed as a site-specific study taking conservative account of:

- potential odour sources from GSTP
- locations and characteristics of the odour sources
- locations of sensitive receptors (i.e. existing residences and Lot 4)
- weather conditions, including predominant wind directions
- site features that may affect odour propagation and dispersion
- the likely risk of odour impacts with consideration of:
  - the relatively small scale (capacity) of GSTP (and therefore the associated small scale of odour emissions)
  - the separation distance between GSTP and Lot 4 in comparison to published minimum recommended buffer distances between waste water treatment plants and sensitive land uses.

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- the prevailing wind conditions, in particular the frequency of wind directions that would be required to transport odour from GSTP to Lot 4, but also the frequency of wind directions that would transport odour to the existing nearby sensitive receptors (residences) without apparent concern.

Being a site-specific assessment, incorporating contingency for a population of 1,000 potentially-affected residents, SLR considers a 160 m separation distance for GSTP to be appropriate. This contrasts with NSW Water Directorate's recommended STP buffer of 400 m, which can be considered a blanket distance, chosen to be conservative with no consideration of the elements listed above.

As presented in Figure 1, attached, a 400 m buffer would encompass existing residences. SLR is not aware of any existing ongoing nuisance issues associated with odour from the existing GSTP activities. This absence of odour-related complaints from the existing residential areas indicates that the facility is achieving acceptable performance with regard to odour emissions. SLR considers that the emission of odour (intensity and character) is not offensive at the distances that existing sensitive receptors are located, as would be expected for a facility of this size, noting that these receptors are both closer to and (as discussed in our 2021 assessment report), downwind of the facility for a significantly greater proportion of the time than the Site. SLR does not consider a 400 m buffer distance to be appropriate in this situation, and indeed believes that imposing such a buffer will unnecessarily sterilise a large area of as yet unrealised land.

In response to Council's request that the buffer zone commence from the boundary of Lot 2 DP607629, a 160 m buffer conservatively assumed to extend from the perimeter of Lot 2 is presented in Figure 2, attached. Note this is conservative as it assumes that the activity boundary is the same as the Lot 2 boundary. This is unlikely to be the case, with any new pondage systems likely to be set in from the site boundary. Nevertheless, this conservative buffer leaves the majority of the Site available for subdivision, for which amendments to the Local Strategic Planning Statement are now sought.

Yours sincerely

JASON SHEPHERD
Principal, Air Quality

Checked/
Authorised by: KL

Figure 1 Existing GSTP Activity Area: 160 m and 400 m Buffers

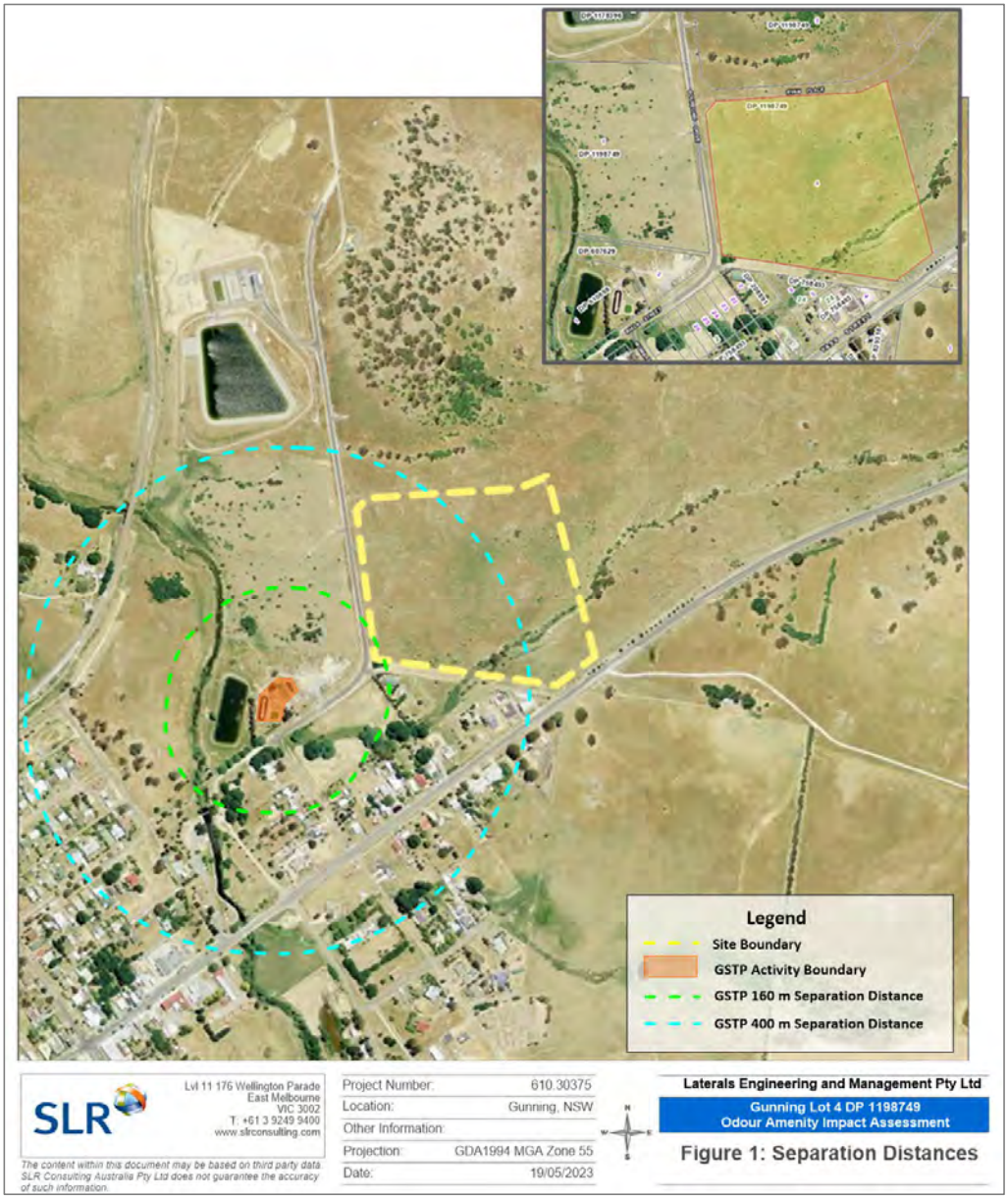
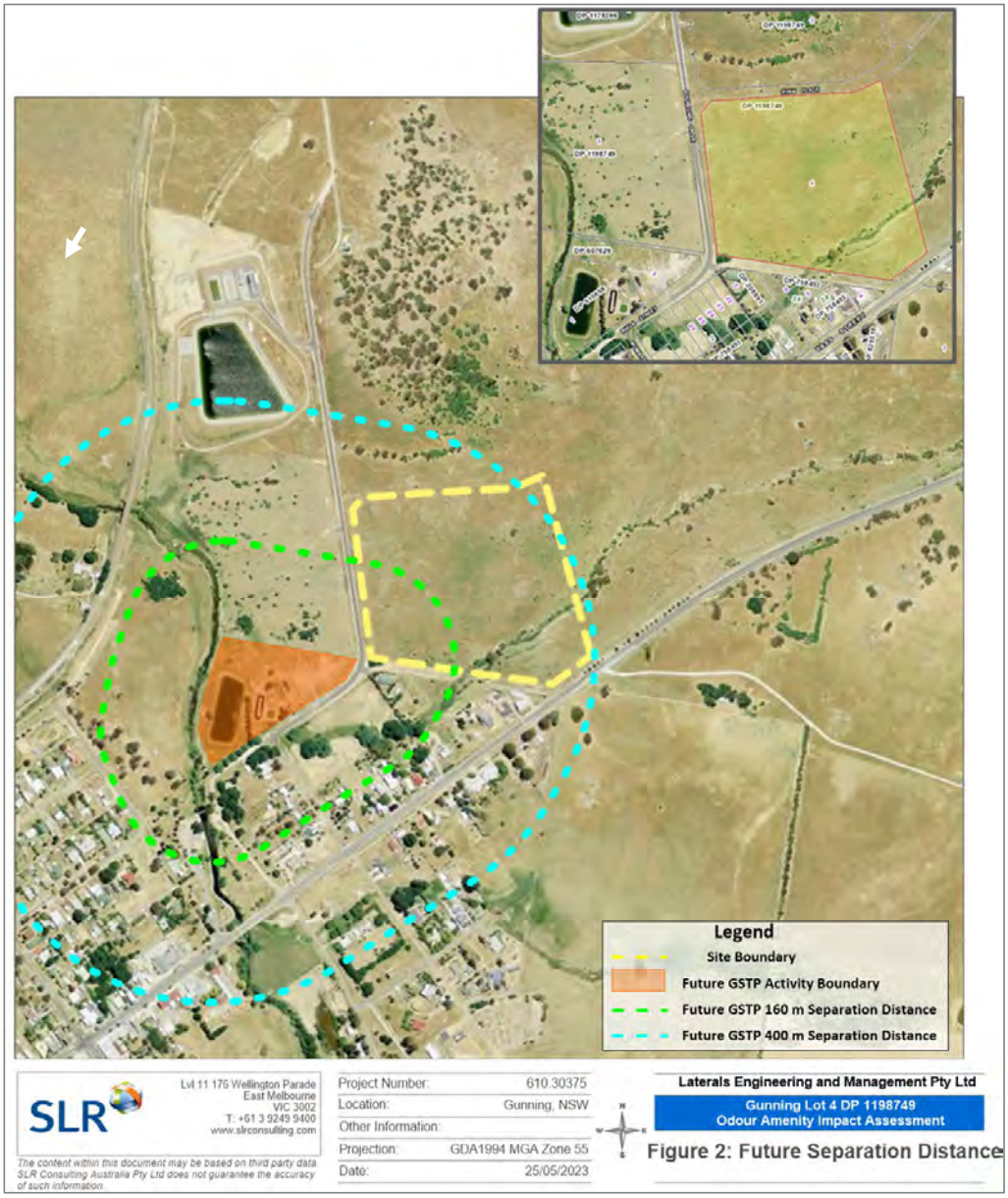


Figure 2 Potential Future GSTP Activity Area: 160 m Buffer and 400 m Buffers



31 May 2022

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NSW EPA
Unit Head
Regulatory Operations Regional
Email: epa.southopsregional@epa.nsw.gov.au

Attention: Janine Goodwin

Dear Janine

Gunning Lot 4 DP 1198749
Response to EPA Advice (DOC22/308502)

I refer to your letter to Ms Siobhan Scott Nielson (22 April 2022) regarding the planning proposal for rezoning of Lot 4 DP 1198749 (the Site) from Rural Small Holdings RU4 to Rural Village RU5 and your concerns regarding the proximity of the Lot to Gunning Sewage Treatment Plant (GSTP) and Gunning Landfill. In particular, you state that your concerns relate to the potential for odour and noise emissions associated these facilities adversely impacting the Site and proffer consideration of EPA NSW document "*Technical Framework – Assessment and management of odour from stations sources in NSW*" (the Technical Framework).

SLR have previously prepared an odour amenity impact assessment (OAIA) for Lot 4 considering the potential for odour impacts associated with GSTP that we consider covers the relevant aspects of the Technical Framework including the likelihood of land-use conflict. We acknowledge the oversight in not including the Technical Framework, and the *Technical Notes: Assessment and management of odour from stationary sources in NSW* in the list of relevant standards and guidelines in Section 1 of the report, however the approach used addresses the content of these documents, as presented below.

Firstly however, regarding Gunning Landfill, it is our understanding that this site has not been operating as a landfill since 2017 and is now a relatively small waste transfer station consisting of a gravelled area on which several skip bins are available to accept waste and recyclables from the public (refer Figure 1). We note that this facility is approximately 2.9 km west of Lot 4, on the other side of the existing residences of Gunning (refer Figure 2), and therefore consider it to pose no risk of adverse odour (or noise) impacts at Lot 4.

Secondly, in consideration of noise from GSTP, previous noise impact assessments undertaken for other development sites located in closer proximity to GSTP than Lot 4 (i.e. 70 – 80 m separation) found that while noise from GSTP was audible at 70 m and at 80 m, levels were observed to comply with the lowest possible noise limits at all times (including at night). It follows then, that with at least 160 m separation from GSTP, the levels at the Site would also comply with these criteria and therefore noise amenity would not be adversely affected. On this basis, SLR does not consider there to be any concerns with regard to the noise amenity at Lot 4 resulting from GSTP activity.

With regard to the potential for adverse odour impacts at Lot 4 resulting from GSTP operations, SLR's OAIA includes several relevant considerations in-line with the Technical Framework's guidance, noting that in general, the Technical Framework approaches the interface of a facility and sensitive land use from the facility's perspective, and therefore many of its considerations are not applicable here.

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With regard to GSTP, an existing activity, we note that Section 1.6 of the Technical Framework, *Odour criteria for existing activities*, states:

> *Once a facility is operational the benchmark for the facility is no longer the odour assessment criteria but whether the emission of odour is:*
>
> - *'offensive' (for scheduled activities), or*
> - *being prevented or minimised using best management practices (for scheduled and non-scheduled activities).*

SLR is not aware of any existing ongoing nuisance issues associated with odour from the existing GSTP activities. This apparent absence of odour-related complaints from the existing residential areas indicates that the facility is achieving acceptable performance with regard to odour emissions. SLR considers that the emission of odour (intensity and character) is not offensive at the distances that existing sensitive receptors are located, as would be expected for a facility of this size, noting that these receptors are both closer and (as discussed in our assessment), downwind of the facility for a significantly greater proportion of the time than the Site proposed for land use change.

Section 4 of the Technical Framework sets out three levels of assessment:

- Level 1 – screening level technique based on generic parameters for the type of activity and site (only available for broiler chicken farms, piggeries and cattle feedlots)
- Level 2 – screening modelling assessment
- Level 3 – refined modelling assessment

As noted above, there are no Level 1 screening techniques available in the Technical Framework for STPs. Performing a Level 2 (or 3) modelling assessment requires detailed design and operational information for the STP to provide a reliable assessment, and would only be warranted if there was a reasonable risk of nuisance impacts. SLR's OAIA therefore presents a qualitative assessment of odour risks, which concluded that the risk was very low and therefore a more detailed assessment is not required.

In line with the Technical Framework Section 6.2 *Odour impact Assessment check list*, SLR's OAIA includes consideration of:

- potential odour sources from GSTP
- locations and characteristics of the odour sources
- locations of sensitive receptors (i.e. existing residences and Lot 4)
- weather conditions, including predominant wind directions
- site features that may affect odour propagation and dispersion, including topography
- the likely risk of odour impacts with consideration of:
  - the relatively small scale (capacity) of GSTP (and therefore the associated relatively small scale of odour emissions)
  - the separation distance between GSTP and Lot 4 in comparison to published minimum recommended buffer distances between waste water treatment plants and sensitive land uses.

- the prevailing wind conditions, in particular the frequency of wind directions that would be required to transport odour from GSTP to Lot 4, but also the frequency of wind directions that would transport odour to existing nearby sensitive receptors (residences) without apparent concern.

Note also that the Technical Framework Section 5.5 *Managing odour in the pathway* proposes the "Purchase or long-term leasing of neighbouring properties provides a secure buffer zone around a facility and increases the separation distance between the site of the odour emissions and existing (or potential) sensitive receptors." In addition, Section 5.4 *Managing odour at the source* describes locating "odour-generating activities taking account of topography and property boundary to maximise the 'on-site buffer' between the odour generating activities and the boundary and receptors." The OAIA considered the buffer distance between odour emissions sources and the potential sensitive receptors of Lot 4 and concluded that it is adequate to mitigate the risk of odour impacts (equal to or greater than the relevant recommended minimum separation distance of 160 m). It is our understanding that the southwest of the Site is now to include an area to be used for access and passive recreation, effectively creating a buffer area such that the separation between GSTP and Site residences will be at least 250 m.

In addition, SLR's OAIA considers known complaints history for existing sensitive receptors. While SLR was unable to determine the existence of any complaints held by Council, the OAIA notes that during previous similar studies in Gunning, anecdotal advice was obtained that there was no significant history of odour nuisance in the area.

In summary, SLR considers the OAIA for Lot 4 adequate to demonstrate low risk of land-use conflict due to the following:

- the small scale and odour potential of GSTP
- the separation distance to residences within Lot 4 being greater than the relevant recommended separation distances
- the low frequency of wind directions required to promote odour transport from GSTP to Lot 4
- the apparent absence of odour nuisance at sensitive receptors closer (and in several cases, within the recommended separation distance) to GSTP and in directions experiencing higher frequencies of wind directions required to promote odour transport from GSTP.

SLR considers that the OAIA meets the intent of the relevant aspects of the Technical Framework and that the qualitative low-risk outcome indicates that a more detailed assessment (e.g. predictive modelling) is not warranted.

Yours sincerely

JASON SHEPHERD
Principal, Air Quality

Checked/
Authorised by: KL

Figure 1 Gunning Waste Transfer Station

Source: https://www.upperlachlan.nsw.gov.au/news/gunning-waste-facility-become-waste-transfer-station

Figure 2 Gunning Waste Transfer Station Location

Source: Nearmap.com

Laterals
Planning
Engineering & Management
Environmental

Our Ref.: 2022

The General Manager
Upper Lachlan Shire Council
PO Box 42
GUNNING NSW 2581

Attention: Simon Arkinstall / Karinne Granger

Re Planning Proposal: PP-2024-121
Gunning Heights Estate, 18 Boureong Drive, Gunning

Dear Simon / Karinne,
I refer to your email dated 1 July 2024 forwarding a copy of government agency responses received in respect to the above development and please find detailed below a response on behalf of Stuart and Catharine Duke to the matters raised. The responses were received from:

- Biodiversity, Conservation and Science, Regional Delivery (BCRD);
- Transport for New South Wales;
- State Emergency Services;
- NSW EPA.

The additional studies required to address the issues raised has required refinement of the proposed zoning map, lot size map and concept development maps. Please see separately attached:

- Land Zone map dated 24 September 2024.
- Land Zone map with concept development.
- Lot Size map dated 24 September 2024.
- Lot Size map with concept development dated 24 September 2024.
- Concept Subdivision plan sheet 1 of 3 dated 24 September 2024.
- Concept Subdivision Topographic plan sheet 2 of 3 dated 24 September 2024.
- Concept Subdivision Aerial Photograph plan sheet 3 of 3 dated 24 September 2024.

The refinement of the plans includes:

- Changes to the initial blanket rezoning.
- RU5 Village Zone to apply to that area outside the 160m separation distance.
  - Minimum lot size 1000m^2.
- RE1 Public Recreation Zone.
  - No minimum lot size.
- MU1 Mixed Use Zone.
  - No minimum lot size.
- C3 Environmental Management Zone.
  - Minimum lot size 4000m^2.

1. **Biodiversity, Conservation and Science, Regional Delivery (BCRD) comments:**
   BCRD indicates that the current version of the planning proposal does not address the Ministerial planning directions 1.1, 3.1 and 4.1. These Directions are detailed below:

- **Direction 1.1 – Implementation of Regional Plans:**
  This Direction has the following objective:
  The objective of this direction is to give legal effect to the vision, land use strategy, goals, directions and actions contained in Regional Plans.
  This Direction was addressed in the current Planning Proposal dated January 2024 at Part 3 Section B Item 3 with a copy included at Appendix 1 of this letter. The Planning Proposal is consistent with the objectives and actions contained within the Draft South East and Tablelands Regional Plan 2041. Strategy 5.1 is encapsulated at Objective 5 9see page 12) and Strategy 6.1 is encapsulated at Objective 6 (see page 14). Compliance with objective 5 (Protect important environmental assets) and objective 6 (Enhance biodiversity, habitats and the connections between them) is further justified in a further Biodiversity Assessment Report dated 4 November 2024 prepared by Macrozamia Environmental Consulting (copy separately attached) which concludes that "*The biodiversity of the site has been assessed and areas of conservation value identified. This information has contributed to the design of the proposal as well as a conceptual subdivision of the site as an example of likely future land use. Through this design process the proposals potential impacts to biodiversity have been avoided and minimised and resulted in a design that improves biodiversity outcomes. The current Zoning of RU4 Primary Production Small Lots promotes agricultural uses that are not conducive to conservation of biodiversity. By changing the land zoning to C3 Environmental Management, in the parts of the site of greatest biodiversity value, land uses will encourage minimal impact activities that support the conservation of biodiversity. Additionally, by applying a minimum lot size of 4000m2 and Restriction on User to this area, land management resources of land owners are concentrated in a smaller area improving the likelihood of weed management and native vegetation promotion along the creek line which is the greatest biodiversity asset on the land protecting several Eucalyptus rubida trees. On the upper slope there is also a Eucalyptus melliodora tree with some young regeneration. This tree is to be retained and it is proposed it will be protected through the provisions of Clause 6.2 Biodiversity of Upper Lachlan Local Environmental Plan 2010. There are no other biodiversity issues associated with this proposal and the net negative impact of this proposal on flora and fauna and biodiversity generally will be negligible*." (Page 42)

- **Direction 3.1 – Conservation Zones:**
  The Direction has the following objective:
  The objective of this direction is to protect and conserve environmentally sensitive areas.
  This Direction was addressed in the current Planning Proposal dated January 2024 at Section 6 (page 33), however, an updated Biodiversity Assessment Report dated October 2024 has been prepared by Macrozamia Environmental Consulting and a copy is separately attached. The report includes the following statement:
  "The biodiversity of the site has been assessed and areas of conservation value identified. This information has contributed to the design of the proposal as well as a conceptual subdivision of the site as an example of likely future land use. Through this design process the proposals potential impacts to biodiversity have been avoided and minimised and resulted in a design that improves biodiversity outcomes. The current Zoning of RU4 Primary Production Small Lots promotes agricultural uses that are not conducive to conservation of biodiversity. By changing the land zoning to C3 Environmental Management, in the parts of the site of greatest biodiversity value, land uses will encourage minimal impact activities that support the conservation of biodiversity. Additionally, by applying a minimum lot size of 4000m2 and Restriction on User to this area, land management resources of land owners are concentrated in a smaller area improving the likelihood of weed management and native vegetation promotion along the creek line which is the greatest biodiversity asset on the land protecting several Eucalyptus rubida trees." (Page 42)

The amended zoning plan will protect and conserve environmentally sensitive areas with the inclusion of the E3 Environmental Management zone.

- **Direction 4.1 – Flooding:**
  The Directive has the following objective:
  The objectives of this direction are to:
  (a) ensure that development of flood prone land is consistent with the NSW Government's Flood Prone Land Policy and the principles of the Floodplain Development Manual 2005, and
  (b) ensure that the provisions of an LEP that apply to flood prone land are commensurate with flood behaviour and includes consideration of the potential flood impacts both on and off the subject land.

  A Flood Impact and Risk Assessment (FIRA) has been prepared by Catchment Simulation Solutions (CSS) dated October 2024 and a copy is separately attached. Direction 4.1 is addressed at Section 4 of the report. The assessment indicates that the planning proposal is consistent with the objectives:
  - Objective (a):
    "Consistent: It is noted that the Floodplain Development Manual 2005 has been superseded by the Flood Risk Management Manual 2023. Nevertheless, the underlying principles of both documents are consistent.
    This FIRA was prepared based on flood models originally developed as part of 'The Villages of Crookwell, Gunning, Collector and Taralga Floodplain Risk Management Study and Draft Plan' (Lyall & Associates, 2017), which was prepared using the principles of the NSW Government's Flood Prone Land Policy and Floodplain Development Manual 2005.
    The assessment has shown that the planning proposal allows for development within the site that is compatible with the flood behaviour and function on the land by locating all developable portions of the land outside of the floodplain.
    The proposal is also not predicted to adversely impact on peak flood level or velocity outside of the development site in any flood event due to no works being undertaken within the PMF extent. Therefore, the proposal is not predicted to increase any public or private losses from flooding.
    Furthermore, the development of the site recognises the value of use, occupation and development of the land.
    Each of these outcomes demonstrate that the development proposal meets the key objectives of the NSW Government's Flood Prone Land Policy and Floodplain Development Manual 2005." (Page 19)
  - Objective (b):
    "Consistent: The proposed development arrangement is considered to provide suitable management of the flood behaviour and flood risk by locating developable areas outside of the floodplain. It is considered that there is no potential flood impact during any flood event as all future works will be located outside of the PMF extent." (Page 19)

- **ATTACHMENT A – Biodiversity Comments**
  The BCS advice states "*BCS recommend that an assessment of biodiversity values is carried out consistent with Stage 1 of the Biodiversity Assessment Method (BAM) or similar methodology, to inform the planning proposal and demonstrate consistency with the ministerial local planning directions. This needs to include groundcover, as previously grazed areas can contain significant proportions of native species. Groundcover as well as overstorey is covered by the Biodiversity Conservation Act 2016 (BC Act)".*

Comment: A Biodiversity Assessment Report dated October 2024 has been prepared by Macrozamia Environmental Consulting and a copy is separately attached. The report includes the following statement:
"The biodiversity of the site has been assessed and areas of conservation value identified. This information has contributed to the design of the proposal as well as a conceptual subdivision of the site as an example of likely future land use. Through this design process the proposals potential impacts to biodiversity have been avoided and minimised and resulted in a design that improves biodiversity outcomes. The current Zoning of RU4 Primary Production Small Lots promotes agricultural uses that are not conducive to conservation of biodiversity. By changing the land zoning to C3 Environmental Management, in the parts of the site of greatest biodiversity value, land uses will encourage minimal impact activities that support the conservation of biodiversity. Additionally, by applying a minimum lot size of 4000m2 and Restriction on User to this area, land management resources of land owners are concentrated in a smaller area improving the likelihood of weed management and native vegetation promotion along the creek line which is the greatest biodiversity asset on the land protecting several Eucalyptus rubida trees." (Page 42)

In respect to the identified particular dot point items, the Biodiversity Assessment Report dated October 2024 prepared by Macrozamia Environmental Consulting includes the following comments:

- *Presence of Golden Sun Moth (GSM) habitat.*
  *Synemon plana (*Golden Sun Moth) occurs in Natural Temperate Grasslands and grassy Box-Gum Woodlands in which groundlayer is dominated by wallaby grasses *Austrodanthonia spp*. These habitats are not present in the subject land. The grassland present is generally dense Phalaris which is not suited to this species. (Page 19)
- *Presence of Derived Native Grassland (DNG) from PCT 1330 Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion.*
  Vegetation mapping on the subject land was undertaken by traversing the project site on foot and recording the actual extent of native vegetation with a handheld gis tablet, during site investigations. During this survey, effectively a random meander survey, flora species presence was recorded, including both native and exotic species, and native vegetation mapped. The route walked for this survey is presented in Map 2-1 below, Flora Survey. Vegetation was stratified into vegetation zones based on prima facie PCT and condition was undertaken in order to define zones for plot base surveys, this could be estimated with sufficient confidence following a random meander survey, considering assemblages of plants present and extent of disturbance from past land management, the absence of vegetation or components of forest structure and familiarity with local vegetation communities. One PCT of one condition state (PCT 3376 – Low) was identified, however, it was not of adequate size for application of the BAM survey methodology. (Page 16)
- *Presence of other threatened grassland reptiles, such as Striped Legless Lizard and Pinktailed Worm Lizard.*
  Aprasia parapulchella (Pink-tailed Legless Lizard) inhabits sloping, open woodland areas with predominantly native grassy groundlayers, particularly those dominated by Kangaroo Grass (*Themeda australis*) which is not habitat present, the survey guidelines for this species require turning suitably sized rocks which are very sparse on the subject land.
  Delma impar (Striped Legless Lizard) is mainly found in Natural Temperate Grassland or in secondary grassland nearby. No Natural Temperate Grassland occurs nearby with any continuity with the subject land. The survey guidelines require targeting suitable habitat "all PCTs on the subject land associated with

the species in the TBDC" and no habitat on or near the subject land is suitable habitat.

In respect to native vegetation, the Biodiversity Assessment Report dated October 2024 prepared by Macrozamia Environmental Consulting includes the following comments:

- *The majority of the subject land is exotic vegetation and subject to agricultural management that promotes exotic pasture. The whole of the site was traversed to map native vegetation during a spring survey to maximise the potential for native grasses to be recorded.* (Page 22); and
- *The majority of the subject land is devoid of native vegetation, as indicated in Map 4-1. These areas, apart from the area developed as a dwelling, have been managed for agriculture for many years as a result the grassland is an exotic pasture dominated by Phalaris, clovers are also common and in some areas Yorkshire Fog. Blackberry, Hawthorn and African Boxthorn are also common and widespread. In the area of the creek a greater diversity of plants occur however exotics mostly dominate.* (Page 23).

A development footprint plan indicating areas of impact is separately attached – see Concept Subdivision Topographic Details Sheet 2 of 3 dated 24 September 2024 prepared by Laterals Planning.

- **ATTACHMENT A – Ministerial planning Direction 1.1 Implementation of Regional Plans / Direction 14 of Regional Plan**
  Direction 14 of the South East and Tablelands Regional Plan 2036 states that "*High environmental value lands and the region's networks of biodiversity corridors are mapped in Figure 7. These areas provide diversity and habitat for flora and fauna, including significant koala populations in the Snowy Monaro and Wingecarribee local government areas. Criteria developed by the Office of Environment and Heritage to map lands with high environmental value is detailed on the previous page*."
  Comment: The Biodiversity Assessment Report dated October 2024 prepared by Macrozamia Environmental Consulting includes the following comment:
  "This report provides recommendations, based on its findings, to ensure HEV lands on the subject land are protected in the Upper Lachlan Local Environmental Plan 2010 through mapping under Clause 6.2 – Biodiversity. This includes any areas of likely threatened species habitat and lands supporting habitats of particular value to native biodiversity. The design of the proposal and the conceptual subdivision has also considered areas of greater environmental value avoiding development along the creek line where the greatest biodiversity occurs and reduced the intensity of development in these areas." (Page 12)

- **ATTACHMENT A – Ministerial Planning Direction 3.1 Conservation Zones**
  The objective of Ministerial Direction 3.1 Conservation Zones is to protect and conserve environmentally sensitive areas.
  Comment: The Biodiversity Assessment Report dated October 2024 prepared by Macrozamia Environmental Consulting includes the following comment:
  "This report provides recommendations, based on its findings, to ensure environmentally sensitive areas on the subject land are protected in the Upper Lachlan Local Environmental Plan 2010 through mapping under Clause 6.2 – Biodiversity. This includes any areas of likely threatened species habitat and lands supporting habitats of particular value to native biodiversity." (Page 13)

- **ATTACHMENT B – Flooding Comments**
  Ministerial Planning Direction 4.1 Flooding

The Flood Impact and Risk Assessment (FIRA) prepared by Catchment Simulation Solutions (CSS) at Section 4 of the separately attached report indicates that the planning proposal is consistent with Direction 4.1 and includes the following statements:

"This FIRA was prepared based on flood models originally developed as part of 'The Villages of Crookwell, Gunning, Collector and Taralga Floodplain Risk Management Study and Draft Plan' (Lyall & Associates, 2017), which was prepared using the principles of the NSW Government's Flood Prone Land Policy and Floodplain Development Manual 2005.

The assessment has shown that the planning proposal allows for development within the site that is compatible with the flood behaviour and function on the land by locating all developable portions of the land outside of the floodplain.

The proposal is also not predicted to adversely impact on peak flood level or velocity outside of the development site in any flood event due to no works being undertaken within the PMF extent. Therefore, the proposal is not predicted to increase any public or private losses from flooding.

Furthermore, the development of the site recognises the value of use, occupation and development of the land.

Each of these outcomes demonstrate that the development proposal meets the key objectives of the NSW Government's Flood Prone Land Policy and Floodplain Development Manual 2005." (Page 19)

2. Transport for New South Wales comments:

Transport for NSW (TfNSW) required the preparation of a Traffic Impact Study (TIS) which has been completed by Motion Traffic Engineers Pty Ltd and a copy is separately attached. The TIS was forwarded to TfNSW on the 12 August 2024 and a response was received on the 12 September 2024 – copy separately attached. The advice states that "*TfNSW has reviewed the information provided and has no objections to the PP."*

3. NSW State Emergency Services comments:

Council has undertaken consultation with the SES and a copy of the SES comments dated 15 May 2024 is separately attached. The issues raised have been included in a Flood Impact and Risk Assessment (FIRA) dated October 2024 prepared by Catchment Simulation Solutions and a copy of the assessment is separately attached. The assessment includes the following comments:

"*It is noted that in the PMF, the majority of the southern and western portions of Gunning would be inundated by significant depths of water (>2 metres), and therefore, Gunning would not be a safe evacuation destination. It is more likely that the residents of Gunning would evacuate in the early stages of a flood to higher ground, such as the development site.*

Overall, it is considered that the planning proposal can adhere to the requirements of the NSW SES and allows for safe occupation of future residents during all flood events. If evacuation is required, relocation to the eastern side of Gunning can be undertaken safely (by not traversing through any flood water, or flood water with a maximum of H1 hazard) from all lots in all flood events up to and including the 1 in 500 year ARI. Isolation of the site from Gunning is predicted in the PMF, however, the duration of isolation of 8 hours is considered tolerable given the extreme rarity of such an event and relatively short duration of isolation.

As an aside, it is considered appropriate that a site-specific Flood Emergency Response Plan (FERP) be prepared at DA stage to raise awareness of the potential impacts of flooding within the site, and suggested actions for residents before, during and after a flood event. As suggested by the NSW SES, this plan is not necessarily designed to manage the flood risk, but rather to raise awareness and should complement any flood awareness campaigns the NSW SES undertakes from time to time." (Page 11)

The FIRA was subsequently forwarded to the SES for further comment and a response dated 7 November 2024 was received – copy separately attached. The applicant has no objection to the recommendations.

The FIRA also includes the following statement:
"Although the SES comment identifies lots as becoming isolated from Gunning in at least the 100 year ARI event, the flood depth/hazard hydrographs presented on Plate 3 through Plate 5 demonstrate that in all flood events up to and including the 500 year ARI, safe passage (a hazard of no greater than H1 which is considered as 'passable') is available from the site and into the eastern portion of the township of Gunning (all areas to the east of Meadows Creek). It also indicates that access south, through the eastern portion of Gunning to the Hume Highway is also available from all proposed lots in events up to and including the 500 year ARI. Therefore, it is considered that the residents would not be isolated in events up to the 1 in 500 year ARI.
In the PMF, Plate 3 through Plate 5 indicates that access to/from Gunning would not be possible for a maximum of 8 hours due to the inundation on Wombat Street. Access/egress at these locations would be cut 1 hour after the onset of rainfall providing limited opportunity for advanced evacuation.
Overall, it is considered that the lots resulting from the planning proposal can adhere to the requirements of the NSW SES of requiring access/egress during floods up to and including a 1 in 500 year event." (Table 5 Page 17)

4. NSW EPA comments:

The NSW EPA provided comment on the planning proposal dated 23 May 2024 and required additional information in respect to the following matters:

- **Land use conflict**

  The EPA advice states "*Any land use conflict risk needs to be fully understood and mitigated. Clustering incompatible land uses can result in adverse impacts on industry and sensitive uses, increased regulatory burden on the EPA and Council, and adverse impacts on the environment and human health*."

  Comment: A Land Use Conflict Risk Assessment in accordance with the Dept. of Primary Industries guideline dated October 2011 has been completed and a copy is separately attached. The assessment indicates that the strategic, local, and site-specific circumstances justify development of the land for residential purposes and whilst there are some active rural interfaces, those nearby are generally limited to grazing and land management activities. These are not considered significant risks, nor does the immediate adjoining land represent significant or protected farmland, or widespread/ intensive rural activity. Therefore, the activity that is present at the relevant interfaces is considered manageable. Overall, the identified potential risks are generally low and can be reasonably managed to reduce risk to an acceptable level.

- **Review of Odour Impact Assessment**

  The EPA advice states "*The EPA recommends that Council require the proponent to undertake an odour impact assessment in accordance with the Approved Methods to determine the suitability of the subject site for the proposed residential use*."

  Comment: An Odour Impact Assessment has been prepared by SLR Consulting Australia in accordance with the EPA document '*Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales*.' A copy of the report dated 7 November 2024 is separately attached. The report concludes:

  "*The GSTP has a design of 1,000 persons equivalent capacity, well below the 2,500 persons equivalent capacity requiring of a requiring an environmental impact statement Schedule 3 of the Environmental Planning and Assessment (NSW Government 2000). SLR understands that it is unlikely that the existing GSTP will be upgraded to increase its capacity in its current location.*
  The predicted 99th percentile odour concentrations associated with the existing operation of the GSTP are well below the conservatively adopted criterion of 2 ou at all locations of the Site and therefore SLR considers odour emissions from the GSTP to pose no constraint on the proposed development of the Site."

This assessment quite clearly demonstrates no impact from the GSTP on the proposed development site.

- **Sewerage Infrastructure**
  The EPA advice states "*The EPA regulates Gunning Sewage Treatment Plan (STP) under Environment Protection Licence (EPL) 3110. We understand that this system is approximately 50 years old and has a capacity to treat effluent for a population of 1,000 people. The 2021 census identifies the population of Gunning as 820.*
  When an STP is reaching capacity, there is an increased risk of odours from the plant which may impact on current or future sensitive receivers within its vicinity. The EPA recommends that the capacity of the existing network to receive additional flows should be investigated, as part of this proposal. Any subsequent proposed upgrades should be undertaken in consultation with the EPA."
  Comment: The Upper Lachlan Shire Council has been contacted to advise the capacity of the existing network to receive additional flows, however, no information has been received to date. However, from publicly available information, the NSW Planning Portal indicates that the population of the Upper Lachlan Shire area is expected to have an increase from 8,330 persons to 9,699 persons during the period 2021 to 2041 – an annual change of 0.76%. On this basis, the population of Gunning is expected to increase from 820 persons as at 2021 to 944 persons in 2041. This level of population is less than the capacity of the GSTP and the GSTP has ample capacity for this proposed development. Alternatively, if it is assumed that the population of Gunning increases at a rate greater than the general Council area average of say 2% per annum, the capacity of the GSTP will not be reached for a period of at least 10 years. It is the responsibility of Council to ensure there is adequate planning for the upgrasde / replacement of the GSTP to ensure the objectives of the Housing Strategy are able to be achieved.

- **Contaminated Land**
  The EPA advice states "*When carrying out planning functions under the Environmental Planning and Assessment Act 1979, a planning authority must consider the possibility that a previous land use has caused contamination of the site, as well as the potential risk to human health or the environment from that contamination*."
  Comment: A Preliminary Site Investigation has been prepared by Geosyntec Consultants and a copy of the report dated 3 October 2024 is separately attached. The report concludes:
  Based on the findings of this assessment, Geosyntec concludes the following:
  • Based on the reviewed historical information, the site has largely existed as undeveloped farmland until 2015 (anecdotally confirmed by the site owner), when a residential dwelling, accompanying storage sheds and water tank was construction within the northeastern portion of the site.
  • No visual or olfactory indicators of contamination were observed across the site surfaces or within the six soil boreholes advanced across the site and two sediment samples collected from an unnamed creek in the southeastern section of the site.
  • Four stockpiles comprising a mixture of topsoils and natural clay soils excavated from the site, and one other stockpile containing imported shale gravel was identified in the northeastern section of the site. Based on visual inspection of the material, the stockpiled materials are considered to present a low risk to human health and ecological receptors.
  • Soil and sediment analytical results were below the adopted human health and ecological criteria for low-density residential land use and urban residential and public and open space use. Based on the soil and sediment analytical results potential risk to human health and ecological receptors is considered to be low.
  • Surface water results collected from the eastern and southern site boundary points of the creek recorded concentrations below the adopted assessment criteria except for select heavy metal analytes (discussed in Section 8.6) detected within the sample (SW1E)

collected from the eastern site entry point of the creek. Fraction 2 TRH, Fraction 3 TRH and Fraction 4 TRH were also detected in this sample. The recorded concentrations are considered representative of naturally occurring background ranges or could also be due to offsite source/s. Given that surface water contained within the creek is not utilised for drinking water or irrigation purposes and the water migrating offsite does not appear to be impacted as denoted from the analytical AU124119 R01 ii results of SW1W from the site exit point, the recorded exceedances are considered to present a low risk to current and future site and offsite receptors.

- *Based on the findings of this assessment, historical information, the site's environmental setting, and the proposed residential subdivision no potential source pathway receptor linkages were identified.*
- *The site is considered suitable for the proposed subdivision. No further detailed environmental investigation is deemed warranted to support the proposed subdivision and development.*

A copy of the report was forwarded to the EPA on the 23 October 2024 and on the 31 October 2024 the EPA advised no comment on the report. The report concludes that the site is considered suitable for the proposed subdivision.

If you require any additional information or clarification, please contact me on 0428 483 558 or at robert@laterals.com.au.

Yours sincerely

Robert Mowle
LATERALS ENGINEERING and MANAGEMENT
18 November 2024

APPENDIX 1

The Planning Proposal will:

- Provide new opportunities to locate diverse business options.
- Enable businesses to be established.
- Improve biodiversity connectivity and protection.
- Not impact the Indigenous, European, rural and natural landscapes.
- Provide opportunities for housing diversity and green space.
- Enable business opportunities that can add value.
- Not impact high-value agricultural land
- Provide village residential opportunities.
- Zone land for urban diversity.
- Provide new space to grow adjacent to an existing village.

The Planning Proposal will also not further fragment this rural area and it will provide opportunities for diversification and custodianship of the environmental and scenic values.

2. ***Is the planning proposal the best means of achieving the objectives or intended outcomes, or is there a better way?***

It is considered that this planning proposal is the most appropriate means of achieving the proposed minimum lot size and rezoning for the subject land and is seeking this amendment in accordance with Section 3.21(1) of the *Environmental Planning and Assessment Act 1979* which states:

> ***3.21 Review of environmental planning instruments (cf previous s 73)***
>
> *(1) The Planning Secretary shall keep State environmental planning policies and councils shall keep their local environmental plans and development control plans under regular and periodic review for the purpose of ensuring that the objects of this Act are, having regard to such changing circumstances as may be relevant, achieved to the maximum extent possible.*

Section B - Relationship to strategy planning framework

3. ***Is the planning proposal consistent with the objectives and actions of the applicable regional or sub-regional strategy?***

The planning proposal is consistent with the objectives and actions contained within the *Draft South East and Tablelands Regional Plan 2041* and *The Tablelands Regional Community Strategic Plan 2016-2036.*

Draft South East and Tablelands Regional Plan 2041

The Strategy has a vision relevant to the Planning Proposal stating:

The South East and Tablelands Region is valued as a place where people can live, work, and play throughout their lives. By 2041, it is home to just over 350,000 residents (almost 940,000 residents including the ACT). People are attracted to the region's cities, historic towns and villages. The region's landscape - ranging from Australia's highest peaks, to rural and bush covered plains, hinterland areas and dramatic coastlines – offer residents and visitors a diversity of lifestyle opportunities. Productive agricultural land and natural resources are the foundations of the region's economy, which continues to diversify through growth in the tertiary education, health, waste, energy, tourism and transport sectors. AND

New housing and jobs are located to make the best use of infrastructure and services, while considering natural hazards, catering for long term residents and those who relocate from major population centres. AND

As communities grow, this is balanced against measures to enhance the value and protection of a natural environment that enriches lifestyles, sustains the region's water supply and protects biodiversity and productive agricultural land. Strategic planning ensures the enhancement and quality of waterways, flora and fauna, tree canopy and water infiltration.

The Planning Proposal is viewed as consistent with these visions having regard to the following objectives:

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Objective 3: Support diverse, vibrant and socially active communities

The objective states *"A sense of belonging and shared values can lift and unite people in challenging times, as we have seen during the COVID-19 pandemic and natural disasters. Meeting and gathering places, pedestrian prioritised streets, events, festivals and cultural infrastructure all enable a sense of belonging as driven by placemaking."* And *"Understanding how communities utilise and interact with social infrastructure is essential to manage growth and change. Several forms of infrastructure and services that are widely recognised to support communities:*

- *playgrounds, libraries, heritage, information and education facilities*
- *busy shopfronts, street verges and community gardens*
- *farmers markets and local produce centres*
- *creative arts centres, theatres, live music and coworking spaces*
- *childcare, healthcare and educational facilities*
- *bushcare groups, outdoor gyms, sportsgrounds, aquatic centres, or community spaces.*

These generate more social opportunities when they can be adapted for different uses, accessed by all community members."

Comment: The expansion of the residential area of Gunning will result in an increase in population which will improve the viability and utilisation of a number of infrastructure items in Gunning generally comprising:

- playgrounds, libraries, heritage and education facilities
- local businesses • farmers markets and local produce centres
- creative arts centres and theatres
- childcare and healthcare facilities
- bushcare groups, sportsgrounds and aquatic centres.

The resultant increase in population at Gunning will revitalise and enhance commercial and retail activity in the existing commercial centre of Gunning and provide positive social and economic benefits to the locality.

Objective 4: Preserve the heritage and character of the region's towns and villages

The objective states *"The region's scenic and cultural landscapes provide unique settings for its urban areas and a strong link to its natural and historic landscapes. Providing opportunities to conserve, interpret and acknowledge the region's heritage values, will build an understanding of history and respect for the experiences of diverse communities. Heritage identification, conservation, management and interpretation can allow heritage places and stories to be experienced by current and future generations. Recognising non-Aboriginal heritage must be balanced with the Aboriginal cultural significance of areas – particularly where the celebration of non-Aboriginal heritage has adversely impacted connections to Country, celebration of culture, or represents trauma."*

Comment: An AHIMS search was conducted with buffers of 50m and 200m on the 15 January 2024 with a copy of the results attached at Annexure 7. The search notes there are no Aboriginal sites or artefacts on the subject land. The site of the planning proposal is also remote from the Gunning CBD, is consistent with recent residential development in other areas of Gunning and will not adversely affect the heritage and character of Gunning.

Objective 5: Protect important environmental assets

The objective states *"The South East and Tablelands Region includes a variety of landscapes from the Snowy Mountains, the only wilderness coastline in NSW, rural landscapes and national parks. Home to 150 threatened plant species, 144 threatened animal species, 40 endangered ecological communities, and 14 critically endangered ecological communities, the region's planning needs to closely manage and protect the variety and layers of an interconnected ecological system."* And *"Due to historical land clearing and ongoing land management activities post-colonisation, there is a relatively low proportion of native vegetation in parts of the Hilltops and Upper Lachlan LGAs, as well as in the Capital subregion."*

And "*High environmental value (HEV) lands and the region's network of biodiversity corridors provide diversity and habitat for flora and fauna, including significant koala populations in the Wingecarribee and Snowy Monaro LGAs. To support mapping of HEV lands, additional mapping on High Ecological Aquatic Ecosystems can be found on the SEED portal. Avoiding the impacts on important terrestrial and aquatic habitats and on water quality is a necessary part of planning for the intensification of land uses through urban development and other activities.*"

Comment: The ecological assessment of the subject land undertaken by Macrozamia Environmental Consulting states in the Assessment of Biodiversity Impact:

> *Considering the information detailed above that has been summarised from information collected during field and desktop investigations and assessments of significance for threatened species and communities the following final assessments are made.*
>
> *8.1.Direct Impacts*
>
> *The proposal will result in the 13ha subject site being available to transition from agricultural to residential.*
>
> *8.2.Indirect Impacts*
>
> *Operation of the subject site for residential use will increase traffic on Boureong Drive that may have minor impacts on road strike mortality of fauna. This impact is considered very minor given the low abundance and quality of habitat in the area. As the site transitions to residential landscaping of residential dwellings will increase vegetation diversity. This will result in more animals, particularly birds using the site and be a positive impact on biodiversity.*
>
> *8.3.Potential Impacts on Flora*
>
> *Vegetation impacts will not significantly impact any threatened flora or endangered ecological communities. The proposal will not involve the removal of any significant vegetation, plant habitats or significantly degrade the ecological value of the study area.*
>
> *8.4.Potential Impacts on Fauna and Habitat*
>
> *No areas of important habitat or unique habitat components will be removed as part of this proposal. The impact of the proposal on fauna populations and their habitats is considered likely to be insignificant. No listed threatened fauna or their habitats are considered at risk of impact by this proposal.*

Additionally, the following map indicates that the development site is not identified as strategic agricultural land. As a consequence, the Planning Proposal will not impact the environmental values that apply to the land.

Biophysical Strategic Agricultural Land Map

(Map Source: The Central Resource for Sharing and Enabling Environmental Data in NSW)

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Objective 6: Enhance biodiversity, habitats and the connections between them

The objective states *"Regional biodiversity corridors are native vegetation links within a region, between regions or between significant biodiversity features. They expand and link different habitats and are critical to long-term ecological connections, particularly in the context of long-term climate change."* And *"Koala populations have been impacted by drought and the 2019-20 bushfires, which are estimated to have burned 571,568 ha (Figure 10), equating to approximately 26% of the modelled high or very high suitability koala habitat in the region16. Despite this, breeding populations remain, even in significantly affected areas. Areas known to be important to the species need to be carefully managed so that local populations can recover."*

Comment: The ecological assessment of the subject land undertaken by Macrozamia Environmental Consulting states in the Assessment of Biodiversity Impact that *"No areas of important habitat or unique habitat components will be removed as part of this proposal. The impact of the proposal on fauna populations and their habitats is considered likely to be insignificant. No listed threatened fauna or their habitats are considered at risk of impact by this proposal."*

Objective 7: Build resilient places and communities

The objective states *"To build resilient places and communities, risk exposure (shocks and stresses) needs to be understood. Natural hazards, infrastructure and technological failures need to be assessed from a people-centred, cultural, economic, built form and environmental perspective. With a changing climate, communities need the skills and knowledge to effectively respond to change, ensuring they are better placed to prepare for, prevent, respond to and recover from the risks they may experience."*

Comment: All residential development in the area will be located above the PMF flood level and will not be exposed to natural hazards. Building resilient places and communities involves a holistic and collaborative approach that addresses various aspects of social, economic, and environmental well-being which will be incorporated into the development and will include:

- Fostering a sense of ownership and pride within the community.
- Develop and maintain robust infrastructure that can withstand natural disasters, climate change, and other challenges.
- Incorporate sustainable design principles into the development to enhance environmental resilience.
- Use eco-friendly building materials and design practices to reduce the environmental impact of the development.

The proposed development will be environmentally sustainable, socially inclusive, easy to access, healthy and safe and will integrate walking and cycling networks into the design of the development to encourage physical activity and promote energy efficiency.

Objective 8 - Plan for a net zero region by 2050:

The Objective states *'The NSW Government is committed to achieving a 50% emissions reduction by 2030 and net zero emissions by 2050. Net Zero Plan Stage 1: 2020-2030 sets out how it will meet the first stage of this objective over the next decade.''*

Comment: Achieving net-zero emissions in residential development involves implementing sustainable and energy-efficient practices throughout the entire life cycle of the development and the following concepts will be incorporated as appropriate and required:

- Incorporate passive design strategies to optimize natural light, ventilation, and temperature control, reducing the need for artificial heating and cooling.
- Use high-performance insulation and energy-efficient windows to minimize heat loss and gain.
- Install on-site renewable energy sources such as solar panels to generate clean energy.
- Specify and install energy-efficient appliances, lighting, and HVAC (Heating, Ventilation, and Air Conditioning) systems.
- Implement smart home technologies to optimize energy use and reduce waste.

- Choose sustainable and environmentally friendly building materials with low embodied carbon and long life cycles.
- Prioritize materials with high recycled content and those that are easily recyclable at the end of their life.
- Implement water-efficient fixtures and appliances to minimize water consumption.
- Incorporate rainwater harvesting and graywater recycling systems for non-potable water use.
- Encourage and facilitate waste reduction and recycling practices within the residential community.
- Implement composting programs to divert organic waste from landfill.
- Design landscapes with native, drought-tolerant plants to reduce the need for irrigation.

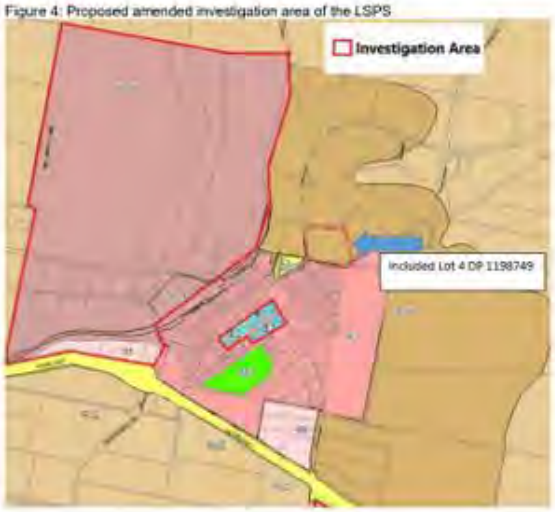
Objective 9 - Secure water resources:
The Objective states *'The State Infrastructure Strategy 2022-2042 identifies the need to improve water security and quality in regional NSW. The future growth and development of the region, coupled with the uncertainties of climate variability and climate change, mean that long-term planning for water supply must be integrated into strategic planning for the region and for adjoining areas including Sydney, which sources a portion its potable water from the northern areas of the region.''*
Comment: The proposed development will be designed to provide a neutral or beneficial effect on water quality and will incorporate water sensitive urban design to minimise the impacts of development on the natural water cycle by protecting natural systems and water quality, integrating stormwater into the landscape, and reducing run off, peak flows and demand for potable water. The subject land is serviced by reticulated water and sewer.

Objective 17: Plan for a supply of housing in appropriate locations
The objective states *"A mix of well-planned infill, greenfield and rural residential development is essential for the region."* And *"Planning for affordable, quality homes in the right locations also requires planning for greater housing diversity to attract and retain younger residents while supporting people who want to stay in their local area as they get older."*
Comment: The proposed development site is the subject of a report to the 14 December 2023 meeting of the Upper Lachlan Shire Council which states:

> *The LSPS sets out the 20-year vision for a local government area, demonstrates how change will be managed and identifies local priorities for updating council's Local Environmental Plan (LEP). Where there is a proposal to amend its LEP Council is required to ensure that it reflects the direction outlined in the LSPS. Where there are inconsistencies the LSPS is required to be updated to incorporate the amended visions or changes. The proposal will change the zone from RU4 Primary Production Small Lots zone to RU5 Village zone. The amendment also proposes to reduce the minimum lot size from 10ha to 1,000m2 to enable the development of dwelling houses on lots to be created under the LEP. The proposal will remove the land from small lot primary production intent to large lot village style living. The planning proposal submits that the land is not particularly good quality land for intensive agricultural use. The Local Strategic Planning Statements recommend new urban areas adjacent to existing villages facilitating Council's existing character as a Shire of villages. Lot 4 DP 1198749, 18 Boureong Drive, Gunning is located within the existing settlement area of Gunning and not identified within the investigation area. Therefore, the LSPS is required to be amended to reflect the land identified within the Planning Proposal. The following maps identify the current investigation area for the township of Gunning within the LSPS and the proposed investigation to include Lot 4 DP 1198749 within the investigation area.*

Figure 3: Extract of the current investigation area for Gunning

Figure 4: Proposed amended investigation area of the LSPS



Council resolved to support the amendment to the Local Strategic Planning Statement (Copy of resolution at Annexure 1) and the proposed development is located in an appropriate location.

Objective 19 - Improve the quality, resilience and sustainability of housing:
The Objective states *'Urban design has a vital role to play in assisting local governments and communities to respond to the challenges that face the region, and rethink how our built environment can support the health and wellbeing of both people and our environment in a changing climate. We need our cities and towns to develop sustainably and adapt to new technology - to foster new and emerging markets, businesses, jobs, and economic prosperity, and to enable the transition to net zero in the built environment. The Urban Design Guide for Regional NSW provides guidance for creating healthy built environments. Applying this guide can support a place based approach in*

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ensuring strategic planning recognises and celebrates the diversity of urban environments, natural landscapes, climates and communities."

Comment: The proposed development will incorporate residential design guidelines and covenants to ensure the development provides quality, resilient and sustainable housing as indicated above and includes:

- Incorporate passive design strategies to optimize natural light, ventilation, and temperature control, reducing the need for artificial heating and cooling.
- Use high-performance insulation and energy-efficient windows to minimize heat loss and gain.
- Install on-site renewable energy sources such as solar panels to generate clean energy.
- Specify and install energy-efficient appliances, lighting, and HVAC (Heating, Ventilation, and Air Conditioning) systems.
- Implement smart home technologies to optimize energy use and reduce waste.
- Choose sustainable and environmentally friendly building materials with low embodied carbon and long life cycles.
- Prioritize materials with high recycled content and those that are easily recyclable at the end of their life.
- Implement water-efficient fixtures and appliances to minimize water consumption.
- Incorporate rainwater harvesting and graywater recycling systems for non-potable water use.
- Encourage and facilitate waste reduction and recycling practices within the residential community.
- Implement composting programs to divert organic waste from landfill.
- Design landscapes with native, drought-tolerant plants to reduce the need for irrigation.

Objective 20 - Manage rural living:

The Objective states *"Rural lifestyle developments give people the option to live in a semi-rural or urban fringe setting. Local housing strategies identify rural residential housing needs and local supply to understand the infrastructure needed to support rural communities."*

Comment: This proposal satisfies the objective in that the development:

- is close to existing an urban settlement to maximise the efficient use of existing infrastructure and services and social and community infrastructure;
- will avoid and minimise the potential for land use conflicts with productive, zoned agricultural land and natural resources; and
- will avoid areas of high environmental, cultural and heritage significance, important agricultural land and areas affected by natural hazards.

This development maximises the use of existing infrastructure and services and doesn't require new services that would impose excessive costs on Council. The development is on the edge of an existing urban area and supports the Upper Lachlan Council narrative with regard to housing that is responding to demographic changes and housing affordability pressures by allowing a mix of housing types. The additional residents will also help to support existing infrastructure; viz. Memorial hall, school, rural fire service, etc. Managing a rural living effectively requires a combination of practical skills, community engagement, and a mindset that appreciates the slower pace and unique characteristics of rural life and can necessitate the following:

- Learn basic skills such as gardening and basic home repairs to become more self-sufficient.
- Utilise alternative energy sources like solar power,
- Participate in local events, community meetings, and gatherings to build relationships with neighbours.
- Join local clubs, volunteer organizations, or community groups to become an active part of the rural community.
- Understand the specific risks and challenges of rural living, such as natural disasters or limited access to emergency services.

- Create an emergency preparedness plan that includes evacuation routes, communication strategies, and emergency supplies.
- Be mindful of water usage and consider implementing water-saving techniques.
- Explore rainwater harvesting and other sustainable water management practices.
- Identify the location of the nearest healthcare facilities and have a plan for medical emergencies.
- Consider telehealth options for routine check-ups and consultations.
- Participate in local events and festivals to build a sense of belonging.
- Embrace eco-friendly practices, such as composting, recycling, and minimizing waste.
- Consider energy-efficient appliances to reduce environmental impact.
- Engage with neighbours to establish a sense of community security.
- Be prepared for seasonal changes, whether it's extreme weather conditions, agricultural cycles, or wildlife patterns.
- Plan for heating and cooling needs based on seasonal variations.

Managing rural living successfully involves adapting to a different lifestyle and being proactive in addressing the unique challenges that come with rural environments. Building a strong connection with the local community and appreciating the benefits of rural living can contribute to a fulfilling and satisfying experience.

Local Narratives (Upper Lachlan)

The Narrative states "*The Upper Lachlan Local Government Area will see a 36 per cent growth in the number of people aged over 65 by 2036. The area has a population of around 8,000, with Crookwell and Gunning providing a health and medical service, a fire brigade, police services, banking, a post office and retail offerings*" and in respect to housing it states "*Support the rural lifestyle and the unique cultural and historic heritage of the area's villages*" and "*Support a variety of housing options and land developments to cater for an ageing population.*"

Comment: The Planning Proposal reflects the existing RU5 zone in Gunning by providing low density residential development which is very flexible, will offer a wide range of housing options whilst maintaining the cultural and historic heritage of Gunning.

The Tablelands Regional Community Strategic Plan 2016-2036

The Tablelands Regional Community Strategic Plan 2016-2036 is a joint initiative by Goulburn Mulwaree Council, Upper Lachlan Shire Council and Yass Valley Council to identify the community's regional aspirations via the strategic priorities that achieve the future visions for the region. These include:

- Environment
- Economy
- Community
- Infrastructure
- Civic Leadership

Each relevant strategic pillar is identified below:

Environment:

Strategy EN1 requires "*Protect and enhance the existing natural environment, including flora and fauna native to the region.*"

The development site as a whole will protect and enhance the existing natural environment including flora and fauna native to the region and will result in the planting of locally sourced native vegetation which will be implemented in accordance with a site specific development control plan.

Strategy EN2 requires "*Adopt environmental sustainability practices.*"

This development maximises the use of existing infrastructure and services and doesn't require new services and thereby provides an environmentally sustainable development.

Strategy EN3 requires "*Protect and rehabilitate waterways and catchments.*"

The development will ensure the existing waterway is protected from stock grazing by the erection of riparian fencing which will enable the waterway area to naturally rehabilitate.

Strategy EN4 requires *"Maintain a balance between growth, development and environmental protection through sensible planning."*
It is considered that the approach taken to achieve this objective, including consideration of environmental constraints, will maintain the balance between growth, development and the environment.

Economy:
Strategy EC3 requires *"Support and foster conditions that enable local and small/home-based businesses to grow."*
This is anticipated by the ample lot size proposed and the location of the site being adjacent to an existing village zone.

Community:
Strategy CO5 requires *"Maintain our rural lifestyle."*
The Planning Proposal is aimed at achieving this objective by providing large area residential lots adjacent to an urban boundary enabling a rural lifestyle to thrive in the locality.

Infrastructure:
Strategy IN3 requires *"Maintain and improve road infrastructure and connectivity."*
There is considered adequate infrastructure in the area to support the proposed residential development. New access roads linking with existing infrastructure will be constructed at the developers cost.

Leadership
Strategy CL4 requires *"Actively investigate and communicate funding sources and collaboration opportunities that can strengthen the region."*
The development will contribute funding towards the provision of services throughout the Upper Lachlan Council area in accordance with the Upper Lachlan Development Contributions Plan 2007.

4. ***Is the planning proposal consistent with a Council's local strategy or other local strategic plan?***

(i) Upper Lachlan Shire Local Strategic Planning Statement 2040:

The Planning Proposal is consistent with the Upper Lachlan Shire Local Strategic Planning Statement 2040 (to be amended) and in particular will provide an opportunity for new settlement close to an existing urban centre. Table 1 of the Statement (Upper Lachlan Shire Council Priorities, Principles and Actions) details the future directions for the Council area – see table below.

Table 1 Upper Lachlan Shire Council Priorities, Principles and Actions

Planning Principles	Priority 1 **Non- Urban Land**	Priority 2 **Urban Land**	Priority 3 **Tourism**	Priority 4 **Business Development**
Drivers of Growth and Sustainability	1.1 (a) Promote a diverse agriculture-based economy. (b) Develop an agricultural strategy to provide for value -adding opportunities and succession.	2.1 (a) Develop village residential opportunities. (b) Design public places of creativity and innovation.	3.1 (a) Identify and locate new tourism opportunities. (b) Support tourism as a key sector in the Shire.	4.1 (a) Promote a diversified transitioning economy and provide for small business development. (b) Provide strategic support to entrepreneurs and tourism operators.
Productivity and collaborative diversity	1.2 (a) Plan for diverse agrobusinesses and agricultural land reform. (b) Encourage vertical integration of the rural economy.	2.2 Zone land for mixed-use, aged care and tourism developments and provide for urban diversity.	3.2 Plan for new tourism and destination opportunities as an economic benefit.	4.2 (a) Encourage and support growth in a variety of sectors to enable diversification of the Upper Lachlan economy.

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