habitat planning

Planning Proposal

Part Lot 52 DP1220883

Boundary Road, Moama

Change of zoning to R2 Low Density Residential with Minimum Lot Size of 1,000m^2

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Contents

Attachments

Introduction

This is a Planning Proposal seeking an amendment to the *Murray Local Environmental Plan 2011* (MLEP) that will facilitate a small amount of residential development in Boundary Road, Moama. Specifically the amendment proposes to rezone approximately 6,000m^2 of land from E3 Environmental Management to R2 Low Density Residential with a 1,000m^2 Minimum Lot Size.

The land is described as the northern part of Lot 52 DP1220883 abutting Boundary Road in Moama ("the subject land"). The context of the subject land is shown in Figures 1 and 2.

The Planning Proposal has been structured and prepared in accordance with the Department of Planning and Environment's (DPE) *A guide to preparing planning proposals* ("the Guide").

PART 1. Intended outcomes

The intended outcome of the Planning Proposal is to allow the subject land to be developed for a small number of residences along the Boundary Road frontage.

PART 2. Explanation of the provisions

The intended outcomes of the Planning Proposal will be achieved by implementation of the following:

- amending the Land Zoning Map Sheet LZN_006B in the MLEP to show the subject land zoned as R2 Low Density Residential; and
- amending the Minimum Lot Size Map Sheet LSZ_006B in the MLEP to show the subject land having a minimum lot size for subdivision of 1,000m^2.

PART 3. Justification

This section of the Planning Proposal sets out the justification for the intended outcomes and provisions, and the process for their implementation. The questions to which responses have been provided are taken from the Guide.

3 1. Need for the Planning Proposal

- **Is the Planning Proposal a result of any strategic study or report?**

The Planning Proposal for the subject land is the result of a broad review of the MLEP undertaken by Council in 2014. As part of this review Council embarked upon a community consultation process to assist in determining changes to the MLEP.

As part of this consultative process, the owner of the subject land made a submission to Council requesting the opportunity to undertake a small residential subdivision as such development is not permissible under the provisions of the current MLEP.

In response to the subject land owner's submission, Council endorsed the following recommendation from its officers:

> *It is recommended that the submission maker supply Council with a study prepared by a suitably qualified consultant regarding the rezoning of the subject area of E3 zoned land. The study shall be undertaken at the full cost of the submission maker. It is also noted that the study will need to be completed and provided to Council in a timely manner to ensure that Amendment 5 of the Murray LEP 2011 is not delayed.*

This Planning Proposal is in response to the recommendation.

- **Is the Planning Proposal the best means of achieving the objectives or intended outcomes, or is there a better way?**

The subject land is currently within the E3 Environmental Management zone and has a minimum lot size of 120 hectares for subdivision and dwellings. Consequently the current planning provisions applicable to the subject land do not allow for the type of subdivision and residential development sought. Consequently the objective of achieving a limited subdivision of the subject land for residential purposes can only be achieved through an amendment to the MLEP.

- **Is there a net community benefit?**

There is an overall net community benefit to be gained from the Planning Proposal by providing for an additional choice of residential environments in Moama. An increase in the town's population supports existing and creates opportunities for new local community and commercial services.

3 2. Relationship to strategic planning framework

- **Is the Planning Proposal consistent with the objectives and actions contained within the applicable regional or sub-regional strategy (including exhibited draft strategies)?**

The *Riverina Murray Regional Plan 2036* (RMRP) was adopted by the NSW government in 2017. The Minister's foreword to the document states that the RMRP "*encompasses a vision, goals, directions and actions that were developed with the community and stakeholders to deliver greater prosperity for this important region.*"

An assessment of the directions contained within the RMRP as they relate to the Planning Proposal is undertaken at Attachment 'D'. In summary, this assessment concludes that the Planning Proposal does not contradict the overall purpose of the RMRP or any Direction relating to the rezoning of land in Moama for residential purposes.

- **Is the Planning Proposal consistent with the local Council's community strategic plan or other local strategic plan?**

There are a number of local strategic influences that support the Planning Proposal.

Community Strategic Plan

Strategic Area (D) in Council's *Community Strategic Plan 2015/2016-2024/25* has as its objective to:

> *Promote the former Murray Shire area as an attractive and viable area for rural, residential, commercial, industrial, recreational and tourism pursuits to ensure community sustainability.*

The Planning Proposal is consistent with this objective as it is creating an attractive residential environment through a small number of lots along Boundary Road facing the Murray River floodplain.

Murray Shire Strategic Land Use Plan

The *Strategic Land Use Plan* (SLUP) for the Murray Shire prepared as a pre-cursor to the MLEP, shows the 1 in 100 year flood level along the southern boundary of the subject land (see Figure 3). This is consistent with the Flood Planning Area defined in the MLEP (see Figure 5) and confirms the subject land is not flood prone in a 1 in 100 year event.

- **Is the Planning Proposal consistent with applicable State Environmental Planning Policies?**

Attachment 'A' provides an assessment of the Planning Proposal against all State Environmental Planning Policies (SEPP's). In summary, many of the SEPP's are not applicable to the former Murray Shire and even less are applicable to the circumstances of the Planning Proposal. The assessment concludes that the Planning Proposal is not inconsistent with any of the relevant SEPP's.

- **Is the Planning Proposal consistent with applicable Ministerial Directions (S.117 Directions)?**

Section 117 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) provides for the Minister for Planning to give directions to Councils regarding the principles, aims, objectives or policies to be achieved or given effect to in the preparation of LEP's. A Planning Proposal needs to be consistent with the requirements of the Direction but in some instances can be inconsistent if justified using the criteria stipulated such as a Local Environmental Study or the proposal is of "*minor significance*".

An assessment of all S117 Directions is undertaken in Attachment 'B'. In summary, the Planning Proposal is either consistent or has some minor inconsistencies with the relevant Directions. Where there is an inconsistency, it has been justified utilising the provisions within each of the Directions.

3 3. Environmental, social & economic impact

- **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?**

The Planning Proposal will facilitate a restricted residential development involving a small number of lots and single detached dwellings. The subject land is a narrow 30 metre wide strip along the southern side of Boundary Road within the urban area of Moama. The subject land adjoins an extensive area of floodplain between Moama and the Murray River that features remnant vegetation and is largely undisturbed with the exception of numerous access tracks.

In the years leading to the commencement of the MLEP in 2011, the former NSW Department of Environment and Climate Change (DECC) provided Council with a mapping layer for biodiversity. This layer reflected a range of attributes including:

- significant native vegetation (including vegetation which has been cleared from >70% of its former range, or is located in a landscape that has been >70% cleared);
- habitat for threatened species, and endangered ecological communities;
- wetlands; and
- wildlife corridors, including roadsides and stock routes of High Conservation Value.

This mapping layer and accompanying model clause were included in the MLEP. An extract from the biodiversity map (Ref: BIO_006) in the MLEP showing the layer within the context of the subject land is depicted in Figure 4. The extract shows that the subject land, with the exception of a small portion at the western end, is excluded from the biodiversity layer.

A more detailed site specific analysis of the potential impacts of the proposal on biodiversity[1] concluded that:

> *None of the Threatened Species listed under the Commonwealth EPBC Act 1999 or the NSW Environment, Planning and Assessment Act 1979 and the Threatened Species Conservation Act 1995 were found on the site, although suitable habitat could occur in nearby protected areas.*
>
> *The remnant individuals of the Red gum-Black box woodland are recommended to be protected within the property development area and the adjacent floodplain reserve. The area of development affected by the proposal is not of significance in terms of habitat change.*

A copy of that assessment is included at Attachment 'G'.

- **Are there any other likely environmental effects as a result of the Planning Proposal and how are they proposed to be managed?**

In a 1 in 100 year flood event, floodwaters are predicted to reach the southern boundary but not encroach on the subject land (see Figure 4). Consequently floodwaters are not a consideration from an environmental effect perspective.

The subject land is mapped as a bushfire risk. An APZ can be accommodated within the subject land and in conjunction with appropriate construction standards for dwellings, will ensure bushfire will have no environmental effect. In consultation with the RFS, that authority has confirmed that future development will be able to achieve compliance with their requirements.

Preparations are underway for the construction of a second river crossing between Echuca and Moama. In Moama the route for the new bridge passes close to the subject land on the eastern side (see Map 9). The new bridge has been subjected to an intensive assessment of environmental impacts, of which noise is one element. The acoustic assessment[2] identified a study area that incorporated the subject land and consequently is a valid reference for considering the impact of noise from future bridge traffic.

Map 9 plots the noise level contours predicted from the new bridge when in use. These levels take account of the recommended noise attenuation measures proposed for the bridge in this location. The acoustical study sets an 'operational goal' of 55dB(A) for the completed bridge at the nearest sensitive receivers (i.e. residences). Map 9 shows that at the eastern boundary of the subject land (closest to the bridge) a noise level of 57dB(A) can be expected. This level would decline as you move westwards across the subject land to the point where the majority is likely to achieve the 'operational goal' for noise.

From the acoustical study undertaken for the new bridge it can be concluded that only the eastern end of the subject land will exceed the 'operational goal' and then by only a small margin. With minor noise attenuation design solutions incorporated (e.g. double glazing) it

[1] Advanced Environmental Systems (2017) - *Biodiversity Assessment Part of a Residential Development Application Boundary Road (Lot 2 & 26) Moama NSW 2731*
[2] Renzo Tonin & Associates (2015) – *Echuca-Moama Bridge Project, EES Noise Impact Assessment Report*

would not be expected that future dwellings on the subject land would be subjected to noise from the new bridge in excess of acceptable limits.

- **How has the Planning Proposal adequately addressed any social and economic effects?**

There will be a positive social and economic effect for the Moama community from the Planning Proposal through an increase in population. This increase will result in an increase in both community and commercial services for residents as well as an increased investment in the local community through subdivision and housing construction.

3 4. State & Commonwealth interests

- **Is there adequate public infrastructure for the Planning Proposal?**

The subject land is located along the southern side of Boundary Road within which all urban infrastructure is provided. The limited residential development of the land can utilise these resources, including reticulated sewerage.

The site is located within walking distance of facilities within the Moama town centre. A supermarket and associated shops is located directly opposite the subject land in Boundary Road.

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

A number of government agencies have been consulted in preparing the Planning Proposal. Copies of agency responses are included at Attachment 'E' and summarised as follows.

The *Department of Industry (Resources & Energy)* advises that it "*has no resource issues to raise in regard to Section 117 Ministerial Direction 1.3 Mining, Petroleum Production and Extractive Industries, as there are no are no current mineral, coal or petroleum titles over the site and the proposal should have no impact upon mineral, coal or petroleum resources*."

The *Office of Environment and Heritage* (OEH) has requested site-specific assessments be undertaken to address Aboriginal cultural heritage and biodiversity. These assessments have been completed and included in Attachments 'G' and 'H' and for which the findings are addressed elsewhere in the Planning Proposal.

OEH have also indicated that a non-compliance with Ministers Direction 4.3 for Flood Prone Land is likely to be justified on the basis the proposal is of "*minor significance*". The proposal is in fact compliant with the Direction because the subject land by definition is not within the Flood Planning Area (FPA) because it is above the 1 in 100 year flood level. This issue of relevance is discussed in more detail in consideration of Ministerial Directions at Attachment 'B'.

It is noted OEH will request Council to undertake a Flood Risk Management Plan (presumably for the Shire as a whole) before finalising the Planning Proposal. It is agreed that the most up-to-date flooding information should be used in consideration of the Planning

Proposal and in this case the relevant reference is the 1999 *Moama Floodplain Management Study*. It is this document that has dictated the extent of the FPA mapped in the MLEP. It is understood Council has no plans to update this document and consequently it is considered unreasonable for consideration of the Planning Proposal to be suspended for how many years until this work is done.

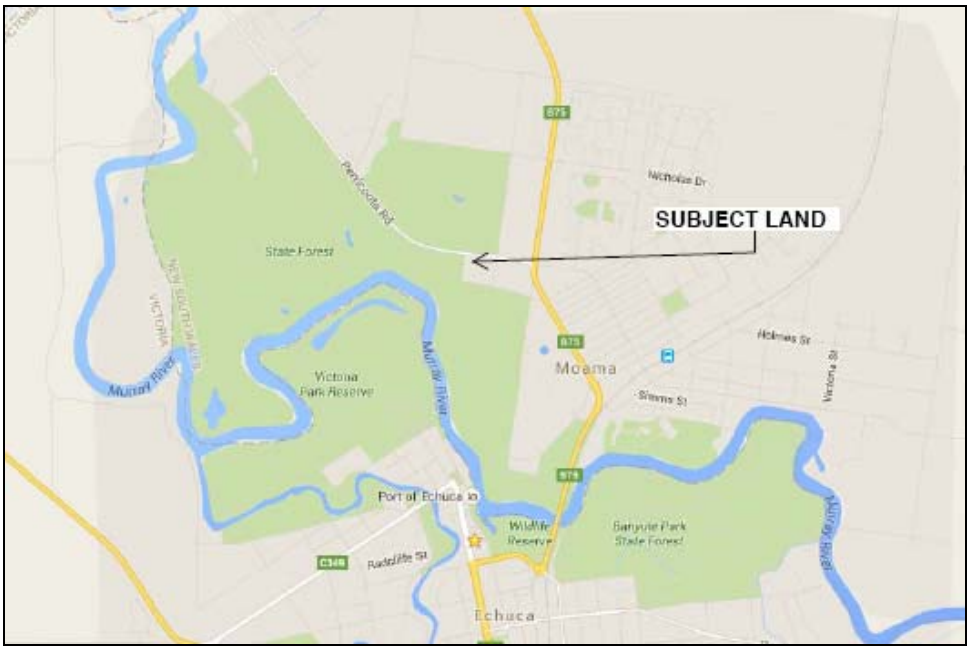
The ***NSW Rural Fire Service*** advises it "*is of the opinion that the proposal will be able to demonstrate future compliance with Planning for Bush Fire Protection (PBP) 2006 and therefore does not object to the progression of the planning proposal…..*". The RFS response was based on a Bushfire Risk Assessment undertaken for the subject land (see Attachment 'F').

The ***NSW Roads and Maritime Services*** (RMS) has requested that some acoustical analysis be undertaken as to the potential impacts on the future use of the land for residential from traffic noise associated with the proposed new river crossing at Moama. This issue is addressed earlier in the Planning Proposal.

Having regard for the nature of the Planning Proposal, it is anticipated no public authority consultation at Commonwealth level will be required.

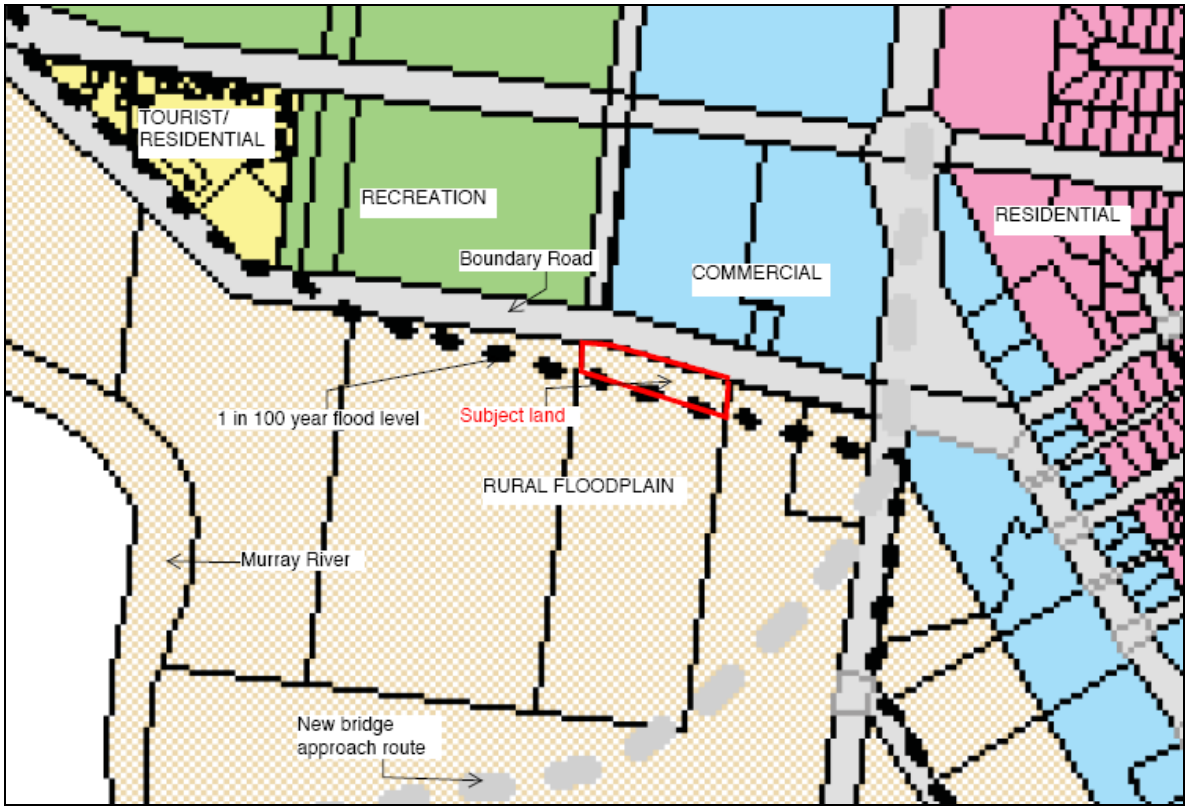
PART 3. Maps

The following maps are provided in support of the Planning Proposal.

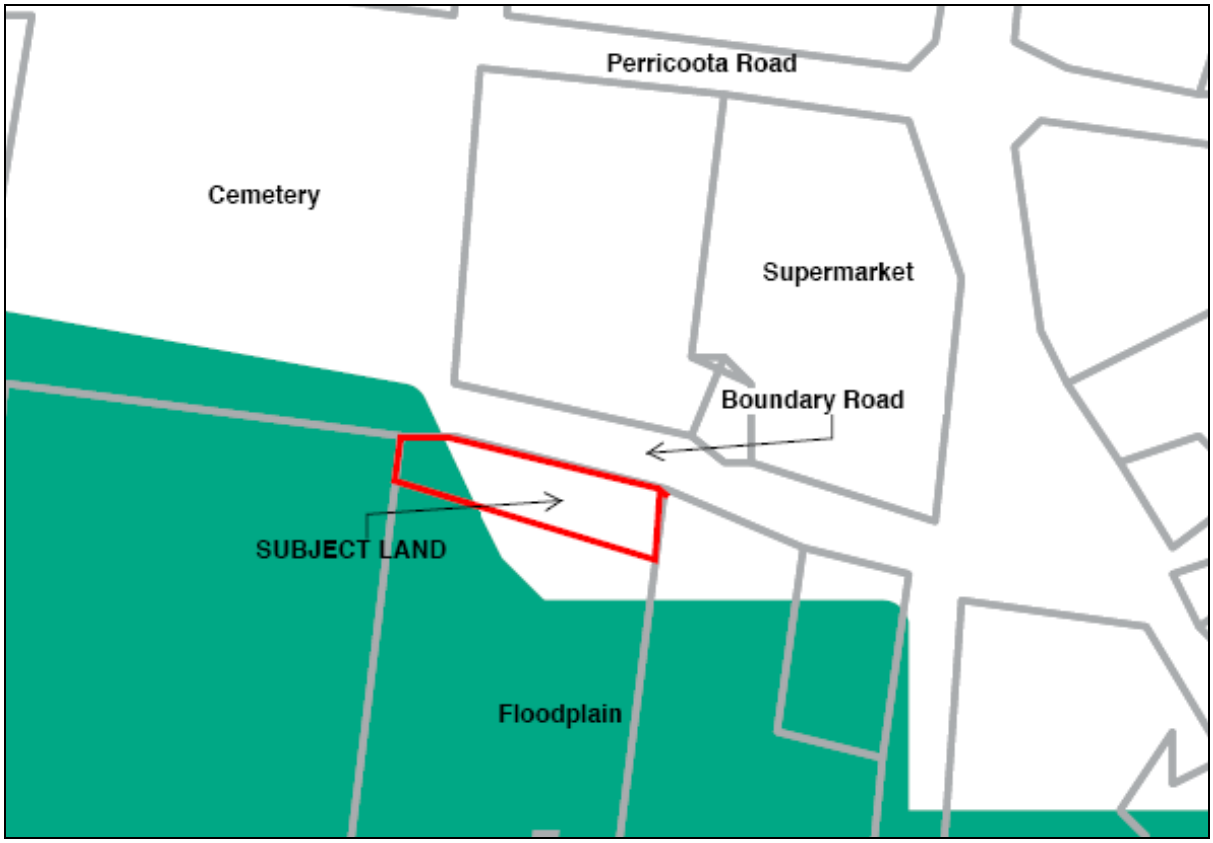


MAP 1: Location of subject within the context of Moama (Source: Google Maps)

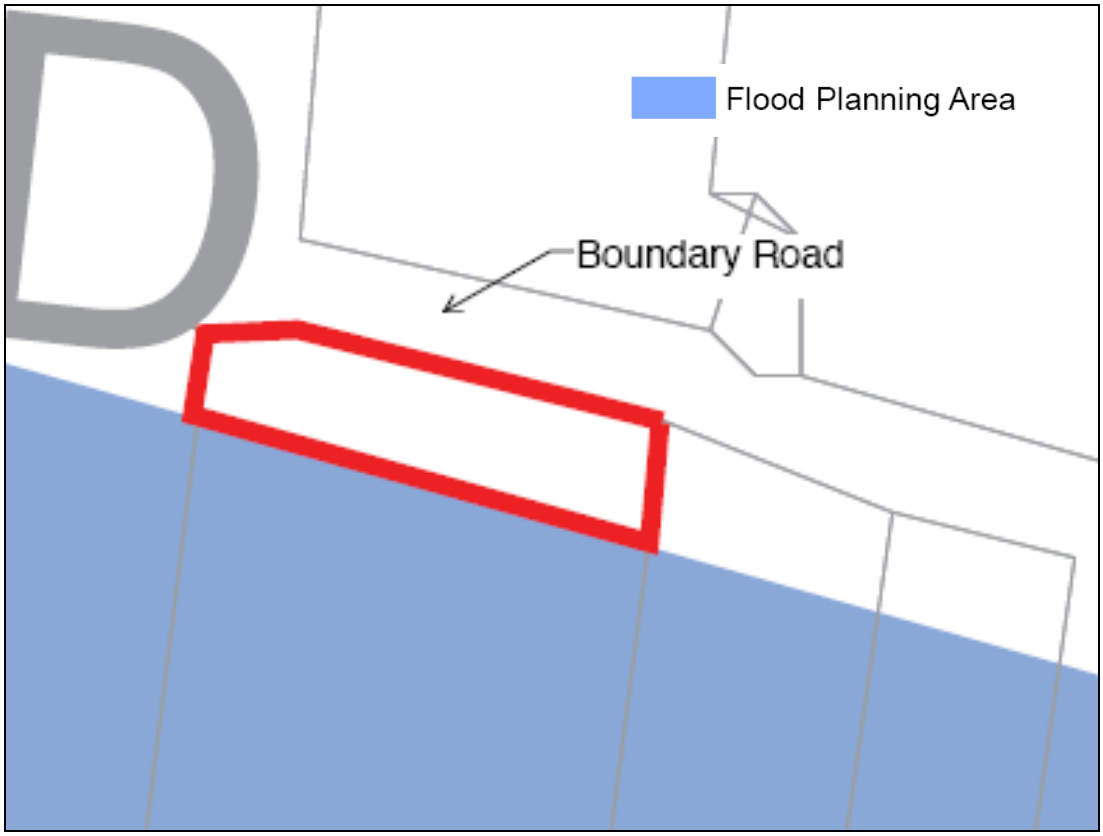
MAP 2: Subject land within the context of land uses in the immediate surrounds. (Source: SIX Maps)



MAP 3: Extract from SLUP for Moama indicating existing and preferred land uses.

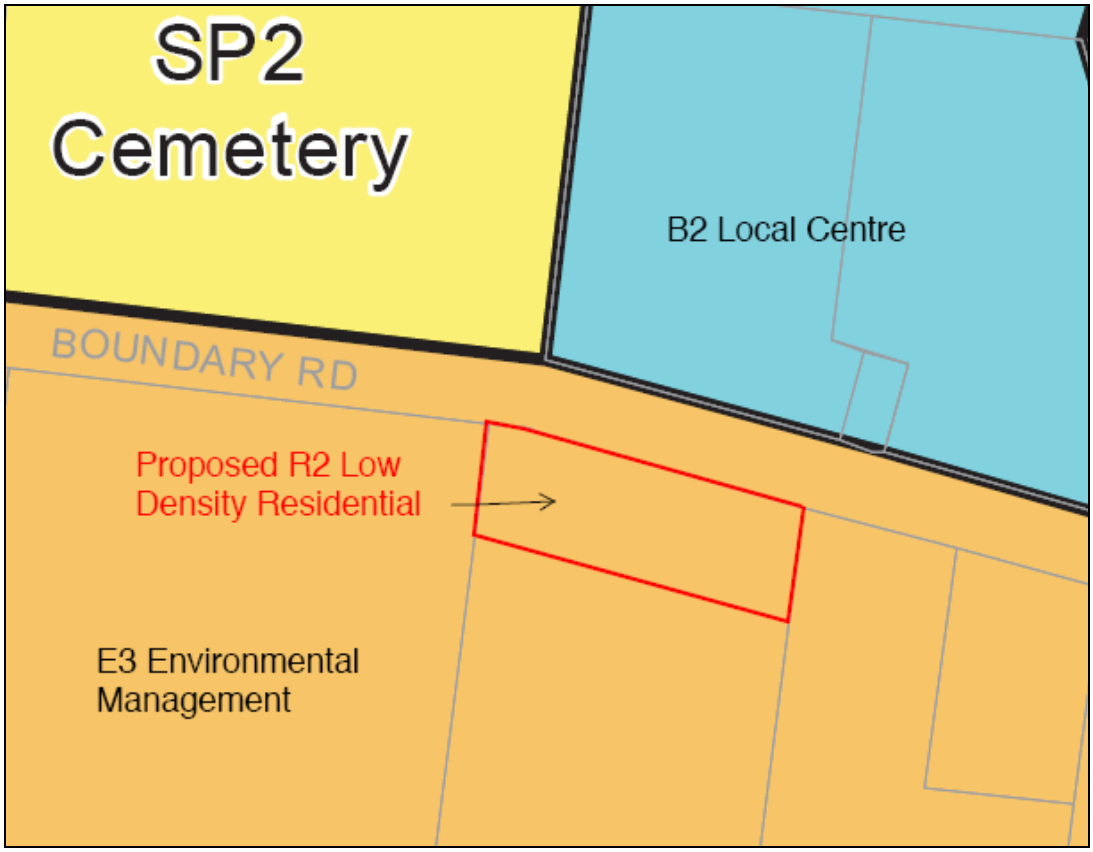


MAP 4: Extent of the biodiversity overlay within the context of the subject land (Source: MLEP))

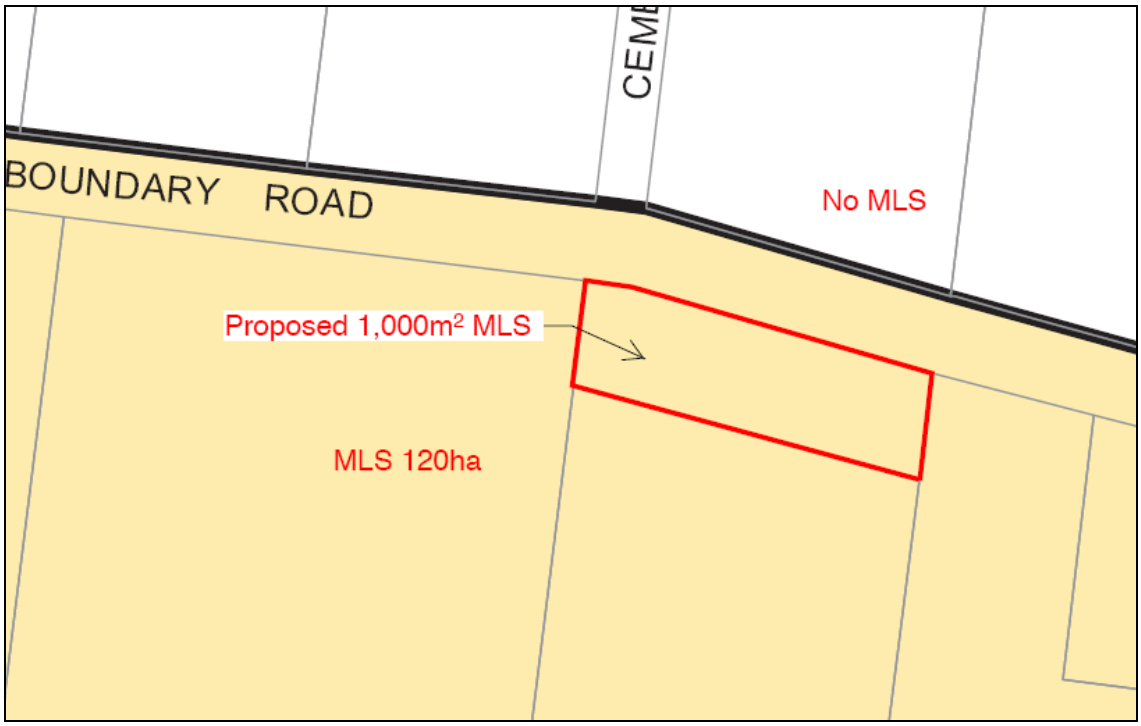


MAP 5: Extent of the Flood Planning Area within the context of the subject land (Source: MLEP).

MAP 6: Bush fire hazard (Source: former Murray Shire Bush Fire Hazard Map)



MAP 7: Current and proposed zoning of the subject land and surrounds
(Source: Murray LEP)



MAP 8: Current and proposed Minimum Lot Size for the subject land and surrounds
(Source: Murray LEP)

MAP 9: Noise contour map from proposed bridge with mitigation measures in place (Source: Acoustic Assessment for proposed Echuca-Moama Bridge)

PART 4. Community consultation

The Planning Proposal will be subject to public exhibition following the Gateway process. The Gateway determination will specify the community consultation that must be undertaken for the Planning Proposal, if any. As such, the exact consultation requirements are not known at this stage.

This Planning Proposal will be exhibited for a period of 28 days in accordance with the requirements of section 57 of the EP&A Act and the Guide. At a minimum, the future consultation process is expected to include:

- written notification to landowners adjoining the subject land;
- consultation with relevant Government Departments and agencies, service providers and other key stakeholders, as determined in the Gateway determination;
- public notices to be provided in local media, including in a local newspaper and on Councils' website;
- static displays of the Planning Proposal and supporting material in Council public buildings; and
- electronic copies of all documentation being made available to the community free of charge (preferably via downloads from Council's website).

At the conclusion of the public exhibition period Council staff will consider submissions made with respect to the Planning Proposal and prepare a report to Council.

It is considered unlikely that a Public Hearing will be required for the proposal although this can't be conformed until after the exhibition/notification process has been completed.

PART 5. Project Timeline

The project timeline for the planning proposal is outlined in Table 1. There are many factors that can influence compliance with the timeframe including the cycle of Council meetings, consequences of agency consultation (if required) and outcomes from public exhibition. Consequently the timeframe should be regarded as indicative only.

TABLE 1: – Project timeline

Milestone	Date/timeframe
Anticipated commencement date (date of Gateway determination).	14 October 2016.
Anticipated timeframe for the completion of required studies.	12 months from Gateway determination.
Timeframe for government agency consultation (pre and post exhibition as required by Gateway determination).	3 months from Gateway determination.
Commencement and completion dates for public exhibition period.	3 months from Gateway determination.
Dates for public hearing (if required).	Not required by Gateway Determination but within 4 weeks of public exhibition completion if deemed necessary by Council.
Timeframe for consideration of submissions.	2 weeks following completion of exhibition.
Timeframe for the consideration of a proposal post exhibition.	1 month following completion of exhibition.
Anticipated date RPA will make the plan (if delegated).	Not delegated to Council.
Anticipated date RPA will forward to the department for notification (if delegated).	Not delegated to Council.

Conclusion

The Planning Proposal is to allow for a restricted residential development within a small strip of land along the southern side of Boundary Road in Moama. An amendment to the MLEP is necessary for such a development to be considered as the current planning regime does not permit it.

In summary, the Planning Proposal is considered to have merit because:

- the subject land is within the urban area of Moama;
- the type and density of development envisaged is sustainable for the subject land;
- there will be a net benefit for the Moama community;
- there is general government agency support;
- it is generally consistent with the broader planning framework (e.g. State provisions);
- there will no detrimental environmental effects; and
- the subject land can be provided with all urban services.

Attachment A

Consistency with State Environmental Planning Policies

No.	Title	Consistency
1	Development Standards	Not applicable since gazettal of MLEP.
14	Coastal Wetlands	Not applicable to former Murray Shire.
19	Bushland in Urban Areas	Not applicable to former Murray Shire.
21	Caravan Parks	Not applicable as 'caravan parks' are prohibited in the R2 zone.
26	Littoral Rainforests	Not applicable to former Murray Shire.
30	Intensive Agriculture	Not applicable as 'intensive agriculture' is prohibited in the R2 zone.
33	Hazardous & Offensive Development	Not applicable as 'industries' are prohibited in the R2 zone.
36	Manufactured Home Estate	The Planning Proposal does not conflict with the aims, strategies, development consent, assessment and location provisions as provided in the SEPP.
44	Koala Habitat Protection	This SEPP is applicable because the former Murray Shire is listed in Schedule 1 and the subject land exceeds the area threshold. Council is required to consider whether the land offers any habitat for koalas. The vegetation on the subject land is principally River Red Gum, which is nominated in Schedule 2 of the SEPP as a 'feed tree species' for koalas. The subject land is not 'core koala habitat' as there have been no recorded sitings or no knowledge of koalas within the River Red Gum environment of the Murray River floodplain near Moama. It is noted that Moama is on the fringe of area identified in the *National Koala Conservation and Management Strategy 2009-2014* as being the range of koalas in Australia. The 2008 approved *Recovery Plan for the Koala in NSW* acknowledges the probability of koalas being present in the 'far west and south west' region of NSW (which includes Moama) is low. Consequently the proposal can be supported without the need for a koala management plan.
47	Moore Park Showground	Not applicable to former Murray Shire.
50	Canal Estate Development	The Planning Proposal does not conflict with the aims and canal estate development prohibitions as provided in the SEPP.
52	Farm Dams and Other Works in Land and Water Management Plan Areas	Not applicable to former Murray Shire.
55	Remediation of Land	As the Planning Proposal will create the opportunity for residential development, Clause 6 of this SEPP requires Council to consider whether the subject land is potentially contaminated. The history of the site is known as rural land used for low level agriculture associated with the river floodplain. Consequently Council can be confident the site is not potentially contaminated and further investigation is not necessary.
62	Sustainable Aquaculture	Not applicable as 'aquaculture' (as a subset of 'agriculture') is prohibited within the R2 zone.
64	Advertising & Signage	The Planning Proposal does not conflict with the aims, development consent requirements and assessment criteria for advertising and signage as provided in the SEPP.

No.	Title	Consistency
65	Design Quality of Residential Flat Development	Not applicable as 'residential flat buildings' are prohibited in the R2 zone.
70	Affordable Housing (Revised Schemes)	Not applicable to former Murray Shire.
71	Coastal Protection	Not applicable to former Murray Shire.
	Affordable Rental Housing 2009	The Planning Proposal does not conflict with the aims and functions of this SEPP as changes do not discriminate against the provision of affordable housing (and consequently affordable rental housing). The MLEP cannot influence the provision of rental housing.
	Building Sustainability Index (BASIX) 2004	The Planning Proposal does not conflict with the aims and development consent requirements relating to BASIX affected building(s) that seeks to reduce water consumption, greenhouse gas emissions and improve thermal performance as provided in the SEPP.
	Exempt & Complying Development Codes 2008	The Planning Proposal does not conflict with the aims and functions of this SEPP with respect to exempt and complying development provisions.
	Housing for Seniors & People with a Disability 2004	Not applicable as 'seniors housing' is prohibited in the R2 zone.
	Infrastructure 2007	The Planning Proposal does not conflict with the aims, permissibility, development consent, assessment and consultation requirements, capacity to undertake additional uses, adjacent, exempt and complying development provisions as provided in the SEPP.
	Kosciuszko National Park – Alpine Resorts 2007	Not applicable to former Murray Shire.
	Kurnell Peninsula 1989	Not applicable to former Murray Shire.
	Major Development 2005	Not applicable as the subject land is not a nominated State significant site.
	Mining, Petroleum Production & Extractive Industries 2007	The Planning Proposal does not conflict with the aims, permissibility, development assessment requirements relating to mining, petroleum production and extractive industries as provided in the SEPP.
	Miscellaneous Consent Provisions 2007	The Planning Proposal does not conflict with the aims, permissibility, development assessment requirements relating to temporary structures as provided in the SEPP.
	Penrith Lakes Scheme 1989	Not applicable to former Murray Shire.
	Murray Regional Environmental Plan No. 2 – Riverine Land	The subject land is within the area to which MREP2 applies. The SEPP requires a Planning Proposal to consider a number of planning principles and this is undertaken in Attachment 'C'. This assessment concludes that the Planning Proposal does not contradict the general planning principles of MREP2 as it will have little to no impact on the riverine environment.
	Rural Lands 2008	This SEPP is relevant because of Ministerial Direction 1.5 Rural Lands (see Attachment 'B' for consideration).

No.	Title	Consistency
	State & Regional Development 2011	Not applicable as the Planning Proposal is not for State significant development.
	State Significant Precincts	Not applicable as the subject land is not within a State significant precinct.
	Sydney Drinking Water Catchment 2011	Not applicable to former Murray Shire.
	Sydney Region Growth Centres 2006	Not applicable to former Murray Shire.
	Three Ports 2013	Not applicable to former Murray Shire.
	Urban Renewal 2010	Not applicable as the subject land is not within a nominated urban renewal precinct.
	Vegetation in Non-Rural Areas 2017	Not applicable to former Murray Shire.
	Western Sydney Employment Area 2009	Not applicable to former Murray Shire.
	Western Sydney Parklands 2009	Not applicable to former Murray Shire.

Attachment B

Consistency with Ministerial Directions

No.	Title	Consistency
1.	Employment and Resources	
1.1	Business & Industrial Zones	Not applicable as the planning proposal does not affect any commercial or industrial zone.
1.2	Rural Zones	Not applicable as the planning proposal does not affect any rural zone.
1.3	Mining, Petroleum Production & Extractive Industries	Not applicable as the planning proposal does not impact on mining.
1.4	Oyster Aquaculture	Not applicable as the subject land is not within a Priority Oyster Aquaculture Area.
1.5	Rural Lands	This direction is relevant because the planning proposal affects land within an environmental zone. The proposal is consistent with the direction because it satisfies the Rural Planning Principles expressed in the SEPP (Rural Lands), namely: a) Not relevant as the characteristics of the subject land are that it currently, and has no potential for, "*productive and sustainable economic activities*". b) Not relevant as the subject land is not used for agriculture. c) The loss of a relatively small parcel of 'rural' land through its rezoning and development will have no impact on the local community. d) The use of the land for residential purposes as part of Moama's continued growth is more in the community's interest than maintain it in 'non-use'. e) The density of development envisaged by the proposed zone and MLS will enable the bulk of the environmental assets of the subject land to be retained. This will be ensured by Council in its role as the consent authority. f) Not applicable as the proposal is not providing for rural housing and lifestyle. g) The proposed housing is not 'rural' but in any case it will have the benefit of all urban infrastructure (e.g. reticulated sewerage) that will minimise environmental impacts. h) The proposal is consistent with the *Riverina Murray Regional Plan 2036* (see Attachment 'D').
2.	Environment and Heritage	
2.1	Environment Protection Zones	This direction is relevant because it applies to all planning proposals. The planning proposal is inconsistent with the direction because it could be construed as reducing the environmental protection standards that apply to the subject land by reducing the MLS and providing for the development of dwellings. This potential inconsistency could be considered justified on the grounds it is of "*minor significance*" because: • the small area of land involved (6,000m^2); • the land represents a very small part of the river floodplain environment in this location; • the ability to retain many of the environmental features through

No.	Title	Consistency
		control of the development process; • the land abuts an urban environment; • the land is not environmentally pristine; and • the proposed bridge works in close proximity to the east will have far more significant impact on the local environment.
2.2	Coastal Protection	Not applicable as the subject land is not within a coastal zone.
2.3	Heritage Conservation	This direction is relevant because it applies to all planning proposals. The planning proposal is consistent with this direction because the subject land does not contain any known "*items, places, buildings, works, relics, moveable objects or precincts of environmental heritage significance*". A heritage study has been undertaken for Moama with all items of significance identified in the MLEP and afforded protection by clause 5.10. None of these items are located in or near the subject land. In addition, a *Due Diligence Assessment – Aboriginal and European Cultural Heritage* has been undertaken (see Attachment 'H') concluding that development can proceed "*without further archaeological investigation.*"
2.4	Recreation Vehicle Areas	This direction is relevant because it applies to all planning proposals. The planning proposal is consistent with the direction because it does not advocate the designation of the subject land as a recreation vehicle area pursuant to an order in force under section 11 (1) of the *Recreation Vehicles Act 1983*.
3.	Housing Infrastructure and Urban Development	
3.1	Residential Zones	This direction is relevant because the planning proposal is advocating an urban residential development. The planning proposal is consistent with this direction because it will provide for a greater choice and supply of housing in Moama; make use of existing urban infrastructure in Boundary Road and provide lots that are within the boundaries of the Moama township. In addition, the MLEP already contains a provision (clause 7.1) requiring development to be adequately serviced.
3.2	Caravan Parks & Manufactured Home Estates	This direction is relevant because it applies to all planning proposals. The planning proposal is not inconsistent with this direction because it does not contemplate "*suitable zones, locations and provisions*" for caravan parks and manufactured homes estates.
3.3	Home Occupations	This direction is relevant because it applies to all planning proposals. The planning proposal will not prevent future dwellings being used for 'home occupations' and hence is consistent with this direction.
3.4	Integrating Land Use and Transport	This direction is relevant because the planning proposal is advocating urban residential development. The planning proposal will facilitate residential development at an urban scale and within the urban boundary of Moama. The subject land is essentially within the the Moama commercial centre. Recreational facilities are available in close proximity at the Moama Recreation Reserve. Having regard for these circumstances, the planning proposal is considered consistent with this direction.

No.	Title	Consistency
3.5	Development Near Licensed Aerodromes	Not applicable as the subject land is not in the vicinity of a licensed aerodrome.
3.6	Shooting Ranges	Not applicable as the subject land land is not in the vicinity of a shooting range.
4.	**Hazard and Risk**	
4.1	Acid Sulphate Soils	Not applicable as the subject land does not contain acid suphate soils.
4.2	Mine Subsidence & Unstable Land	Not applicable as the subject land is not within Mine Subsistence District.
4.3	Flood Prone Land	This direction is relevant because the subject land is 'flood prone land', being land defined as "*susceptible to flooding by the PMF event*" in the *Floodplain Development Manual 2005* (see Map 6). However the provisions of this Direction apply to 'flood planning areas', which are defined on the Flood Planning Map in the MLEP. The subject land is not within a 'flood planning area' and hence by exclusion, the planning proposal is not inconsistent.
4.4	Planning for Bushfire Protection	This direction is relevant because the subject land is mapped as bush fire prone (see Map 6). An assessment of future development of the subject land against the Standards for Bush Fire Protection Measures for Residential Subdivision is undertaken in Attachment 'F'. The proposal is consistent with this direction as the NSW Rural Fire Service has been consulted and does not object (see Attachment 'E').
5.	**Regional Planning**	
5.1	Implementation of Regional Strategies	Not applicable as the subject land is not within one of the regional strategies nominated in this direction.
5.2	Sydney Drinking Water Catchment	Not applicable as the subject land is not within the Sydney Drinking Water Catchment.
5.3	Farmland of State & Regional Significance on the NSW Far North Coast	Not applicable as the subject land is not within one of the local government areas nominated in this direction.
5.4	Commercial and Retail Development along the Pacific Highway, North Coast	Not applicable as the subject land is not near the Pacific Highway.
5.5	Development in the Vicinity of Ellalong, Paxton and Millfield (Cessnock LGA)	Revoked in 2010.
5.6	Sydney to Canberra Corridor	Revoked in 2008.
5.7	Central Coast	Revoked in 2008.
5.8	Second Sydney Airport: Badgerys Creek	Not applicable as the subject land is not near the site for a second Sydney airport.

No.	Title	Consistency
5.9	North West Rail Link Corridor Strategy	Not applicable as the subject land is not near this corridor.
5.10	Implementation of Regional Plans	This direction is relevant because it applies to all planning proposals. The planning proposal complies with this direction because it is consistent with the *Riverina Murray Regional Plan 2036*. Consideration of this regional plan is given in Attachment 'D'.
6.	**Local Plan Making**	
6.1	Approval and Referral Requirements	This direction is relevant because it applies to all planning proposals. The planning proposal is consistent with this direction because it does not propose any referral requirements or nominate any development as 'designated development'.
6.2	Reserving Land for Public Purposes	This direction is relevant because it applies to all planning proposals. The planning proposal is consistent with this direction because it does not remove or propose any public land.
6.3	Site Specific Provisions	Not applicable as the proposal does not propose any site specific provisions.
7.	**Metropolitan Planning**	
7.1	Implementation of A Plan for Growing Sydney	Not applicable as the subject land is not within one of the local government areas nominated in this direction.
7.2	Implementation of Greater Macarthur Land Release Investigation	Not applicable as the subject land is not within one of the local government areas nominated in this direction.
7.3	Parramatta Road Corridor Urban Transformation Strategy	Not applicable as the subject land is not within one of the local government areas nominated in this direction.
7.4	Implementation of North West Priority Growth Area Land Use and Infrastructure Implementation Plan	Not applicable as the subject land is not within the North West Priority Growth Area.
7.5	Implementation of Greater Parramatta Priority Growth Area Interim Land Use and Infrastructure Implementation Plan	Not applicable as the subject land is not within the Greater Parramatta Priority Growth Area.
7.6	Implementation of Wilton Priority Growth Area Interim Land Use and Infrastructure Implementation Plan	Not applicable as the subject land is not within the Wollondilly Shire Council.

Attachment C

Consistency with planning principles in Murray Regional Environmental Plan No.2 – Riverine Land

Principles to be taken into account	Compatibility of proposal
General	
(a) the aims, objectives and planning principles of this plan.	Satisfaction against the general objectives can be determined by the assessment against the specific principles below.
(b) any relevant River Management Plan	There are no known river management plans relevant to the proposal.
(c) any likely effect of the proposed plan or development on adjacent and downstream local government areas.	Polluted stormwater is the only consequence from developing the subject land for residential purposes that could potentially have a detrimental downstream impact. The subject land is just 6,000m^2 in area and more than 400 metres from the river itself hence stormwater from any future development will result in no downstream impacts.
(d) the cumulative impact of the proposed development on the River Murray.	None.
Access	
The waterway and much of the foreshore of the River Murray is a public resource. Alienation or obstruction of this resource by or for private purposes should not be supported.	The proposal does not prevent public access to the river.
Development along the main channel of the River Murray should be for public purposes. Moorings in the main channel should be for the purposes of short stay occupation only.	Not applicable.
Human and stock access to the River Murray should be managed to minimise the adverse impacts of uncontrolled access on the stability of the bank and vegetation growth.	The subject land does not have frontage to the river.
Bank disturbance	
Disturbance to the shape of the bank and riparian vegetation should be kept to a minimum in any development of riverfront land.	The development is not on riverfront land.

Principles to be taken into account	Compatibility of proposal
Flooding	
Where land is subject to inundation by floodwater: (a) the benefits to riverine ecosystems of periodic flooding, (b) the hazard risks involved in developing that land, (c) the redistributive effect of the proposed development on floodwater, (d) the availability of other suitable land in the locality not liable to flooding, (e) the availability of flood free access for essential facilities and services, (f) the pollution threat represented by any development in the event of a flood, (g) the cumulative effect of the proposed development on the behaviour of floodwater, and (h) the cost of providing emergency services and replacing infrastructure in the event of a flood.	The Flood Planning Map in the MLEP shows that the subject land is not flood prone in a 1 in 100 year event.
Flood mitigation works constructed to protect new urban development should be designed and maintained to meet the technical specifications of the Department of Water Resources	Not applicable.
Land degradation	
Development should seek to avoid land degradation processes such as erosion, native vegetation decline, pollution of ground or surface water, groundwater accession, salination and soil acidity, and adverse effects on the quality of terrestrial and aquatic habitats.	The only land disturbance arising from the proposal is site preparation as part of future development. During construction of the future subdivision and dwellings, earthworks will be controlled via a Soil and Water Management Plan.
Landscape	
Measures should be taken to protect and enhance the riverine landscape by maintaining native vegetation along the riverbank and adjacent land, rehabilitating degraded sites and stabilising and revegetating riverbanks with appropriate species.	Notwithstanding that the subject land does not have river frontage, most of the mature trees on the subject land should be capable of being retained in any future development. The proposed MLS of 1,000m^2 will assist in achieving this goal.
River related uses	
Only development which has a demonstrated, essential relationship with the River Murray should be located in or on land adjacent to the River Murray. Other development should be set well back from the bank of the River Murray	As the definition 'River Murray' includes water bodies associated with the river itself, this principle is relevant to the subject land. The proposal could be considered inconsistent with this principle on the basis it has no "*essential relationship*" with the river. However the small area of land sought to be rezoned is above the flood plain (i.e. not in the Flood Planning Area) and immediately adjoining the urban area of Moama. It is noted that the subject land is more than 400 metres from the river itself at the closest point.

Principles to be taken into account	Compatibility of proposal
Development which would intensify the use of riverside land should provide public access to the foreshore.	The subject land is not 'riverside' land.
Settlement New or expanding settlements (including rural-residential subdivision, tourism and recreational development) should be located: (a) on flood free land, (b) close to existing services and facilities, and (c) on land that does not compromise the potential of prime crop and pasture land to produce food or fibre.	The proposal could be considered as a small expansion to a settlement (i.e. Moama). The subject land is not within the Flood Planning Area and has access to all urban services in Boundary Road. The subject land is not 'prime' agricultural land.
Water quality All decisions affecting the use or management of riverine land should seek to reduce pollution caused by salts and nutrients entering the River Murray and otherwise improve the quality of water in the River Murray.	The subject land is currently uncontrolled for stormwater run-off onto the floodplain of the river. Development of the land for residential purposes will come with the requirement to collect and treat stormwater prior to discharge on to the floodplain. This scenario has the potential to lessen impacts on water quality.
Wetlands Wetlands are a natural resource which have ecological, recreational, economic, flood storage and nutrient and pollutant filtering values. Land use and management decisions affecting wetlands should: (a) provide for a hydrological regime appropriate for the maintenance or restoration of the productive capacity of the wetland, (b) consider the potential impact of surrounding land uses and incorporate measures such as a vegetated buffer which mitigate against any adverse effects, (c) control human and animal access, and (d) conserve native plants and animals	The subject land does not contain a wetland. A contained billabong extends along the southern boundary of the proposed zone boundary. The water inputs to this billabong will not be affected by the proposal and the quality of this water should be improved through management of stormwater as part of the future development.

Attachment D

Consistency with the Riverina-Murray Regional Plan 2036

Goal, Direction & Action Title	Applicable to the Planning Proposal	Consistency
Goal 1 – A growing and diverse economy		
Direction 1 – Protect the region's diverse and productive agricultural land.	Not applicable, as the subject land is not used for productive agricultural purposes.	Consideration of the loss of agricultural land is provided in the assessment of the Planning Proposal against the provisions of the Rural Lands SEPP (Attachment 'A') and Ministerial Direction 1.5 Rural Lands (Attachment 'B').
Direction 2 – Promote and grow the agribusiness sector.	Not applicable, as the proposal does not relate to agribusiness.	N/A
Direction 3 – Expand advanced and value-added manufacturing.	Not applicable, as the proposal does not relate to value-added manufacturing.	N/A
Direction 4 – Promote business activities in industrial and commercial areas.	Not applicable, the subject land is not zoned or proposed to be zoned for industrial or commercial purposes.	N/A
Direction 5 – Support the growth of the health and aged care sectors.	Yes, as the Planning Proposal is seeking to rezone land for urban purposes.	The Planning Proposal is generally consistent with this Direction as it seeks to rezone land for urban purposes. It is noted that health care and aged care developments are permitted with consent within the R2 zone and that the development will support and encourage the short term growth of Moama.
Direction 6 – Promote the expansion of education and training opportunities.	Not applicable, as the proposal does not relate to educational opportunities.	N/A
Direction 7 – Promote tourism opportunities.	Not applicable, as the proposal does not relate to tourism.	N/A

Direction 8 – Enhance the economic self-determination of Aboriginal communities.	Not applicable to the subject proposal.	N/A
Direction 9 – Support the forestry industry.	Not applicable, as the proposal does not relate to forestry.	N/A
Direction 10 – Sustainably manage water resources for economic opportunities.	Not applicable to the subject proposal.	N/A
Direction 11 – Promote the diversification of energy supplies through renewable energy generation.	Not applicable to the subject proposal.	N/A
Direction 12 – Sustainably manage mineral resources.	Not applicable, as the subject land is not known to contain any significant mineral resources.	N/A
Goal 2 – A healthy environment with pristine waterways		
Direction 13 – Manage and conserve water resources for the environment.	Not applicable, as the subject land is not known to contain any water resources.	N/A
Direction 14 – Manage land uses along key river corridors.	Yes, as the Planning Proposal is in proximity of the Murray River.	The Planning Proposal is generally consistent with the actions of this direction, despite the fact that it is seeking to rezone land for urban purposes in proximity of the Murray River. Consideration of the impacts of the Planning Proposal on the riverine environment is considered in the assessment against the requirements of MREP2 at Attachment 'C'.

Direction 15 – Protect and manage the region's many environmental assets.	Yes as the subject land adjoins an environmental asset in the river floodplain.	The proposal involves only a small area of land (6,000m^2) and will result in a relatively low density of development. This creates the opportunity to not only protect some of the vegetation on the subject land but to minimise impacts on the adjoining land.
Direction 16 – Increase resilience to natural hazards and climate change.	Not applicable as the subject land, with the exception of being mapped as bushfire prone land, is not identified as at risk from natural hazards.	The RFS has no objection to the proposal; (see Attachment 'E') and an assessment of future development of the subject land against the Standards for *Bush Fire Protection Measures for Residential Subdivision* is undertaken in Attachment 'F'.
Goal 3 – Efficient transport and infrastructure networks		
Direction 17 – Transform the region into the eastern seaboard's freight and logistics hub.	Not relevant, as the proposal does not relate to industry or freight.	N/A
Direction 18 – Enhance road and rail freight links.	Not relevant, as the proposal does not relate to freight.	N/A
Direction 19 – Support and protect ongoing access to air travel.	Not relevant, as the proposal will not affect air travel.	N/A
Direction 20 – Identify and protect future transport corridors.	Not relevant to the subject proposal.	N/A
Direction 21 – Align and protect utility infrastructure investment.	Yes, as the proposal seeks to rezone land for urban purposes.	The Planning Proposal is consistent with this Direction and will not place any undue pressures or demands on infrastructure as the development can be adequately serviced. The proposal also does not affect existing cemeteries, crematoriums or the function of existing defence communication facilities.

Goal 4 – Strong, connected and healthy communities		
Direction 22 – Promote the growth of regional cities and local centres.	Yes, as the proposal is on land within Moama.	The Planning Proposal will support and promote the growth of Moama via the rezoning of land for urban residential purposes. This will supply the ongoing healthy demand for residential land in Moama, which is consistent with this Direction.
Direction 23 – Build resilience in towns and villages.	Not relevant to the subject proposal.	An increasing population builds resilience and this will be the outcome of the Planning Proposal.
Direction 24 – Create a connected and competitive environment for cross-border communities.	Yes, as the proposal is part of the cross-border community of Echuca-Moama.	By providing for future residential growth, the Planning Proposal will make a positive contribution to the conurbation of Echuca-Moama. The second river crossing between the two centre is to commence shortly and the subject land is well placed in regards to access to the new bridge.
Direction 25 – Build housing capacity to meet demand.	Yes, as the proposal seeks to rezone land for residential purposes (R2 zone).	The Planning Proposal supports this Direction as it seeks to increase the supply of residential zoned land, which will cater for the short to medium term housing needs of the local community. Moama has demonstrated an ongoing healthy demand for residential land over the past two to three decades and this is expected to continue with retiring so-called 'baby boomers'.
Direction 25 – Build housing capacity to meet demand.	Yes, as the proposed rezoning of the land will create the opportunity for new dwellings.	The rezoning of the subject land for residential purposes is seen to cater for this ongoing demand and ensures that Council has enough appropriately zoned residential land to meet the current and future needs of the community. It is also noted that the subject land has access to reticulated services and there is enough capacity within the council system to accommodate the proposed growth.
Direction 26 – Provide greater housing choice.	Yes, as the proposal will offer additional choice in living environments in Moama.	The proposed R2 zone offers the full range of residential types and hence the Planning Proposal is consistent with this Direction.

Direction 27 – Manage rural residential development.	Not applicable, as the proposal does not relate to rural residential development.	N/A
Direction 28 – Deliver healthy built environments and improved urban design.	Yes, as the proposal is intended to create a new urban environment.	The Planning Proposal is generally consistent with the actions of this Direction bearing in mind that the rezoning of the land alone has little influence on urban design.
Direction 29 – Protect the region's Aboriginal and historic heritage.	Yes, as the development occurring as a result of the rezoning needs to consider the impact on Aboriginal heritage.	An assessment of Aboriginal cultural heritage has been undertaken for the subject land (see Attachment 'H') and concludes there are no impediments to future development.

Attachment E

Agency responses

- DPI Resources & Energy
- Office of Environment & Heritage
- Rural Fire Service
- Roads & Maritime Services

Warwick Horsfall

From: Shayne Kneen <shayne.kneen@industry.nsw.gov.au>
Sent: Monday, 20 March 2017 12:03 PM
To: Warwick Horsfall; Landuse Minerals
Subject: Re: Planning Proposal in Boundary Road Moama - Part of Lot 26 in DP751152 - GSNSW Response (OUT17/11981)

Dear Warwick,

This is a response from the NSW Department of Industry – Geological Survey of NSW (GSNSW).

I refer to your email dated 15/3/2017 seeking advice in regard to the: **rezoning of land located in Boundary Road Moama, comprising part of Lot 26 in DP751152 (Ref PP_2016_MRIVE_003_00)**.

Please be advised that GSNSW has no resource issues to raise in regard to *Section 117 Ministerial Direction 1.3 Mining, Petroleum Production and Extractive Industries*, as there are no are no current mineral, coal or petroleum titles over the site and the proposal should have no impact upon mineral, coal or petroleum resources.

Queries regarding the above information, and future requests for advice in relation to this matter, should be directed to the GSNSW Land Use team at landuse.minerals@industry.nsw.gov.au.

Regards

Shayne Kneen | Geoscientist | Minerals and Land Use Assessment | Geological Survey of NSW

NSW Department of Industry | Division of Resources & Energy

516 High St | Maitland | NSW 2320 | PO Box 344 | Hunter Region Mail Centre | NSW 2310

T: 02 4931 6731 | F: 02 4931 6726 | E: shayne.kneen@industry.nsw.gov.au

W: www.industry.nsw.gov.au | www.resources.nsw.gov.au

Warwick Horsfall

From: Peter Ewin <Peter.Ewin@environment.nsw.gov.au>
Sent: Wednesday, 29 March 2017 2:48 PM
To: Warwick Horsfall
Cc: Andrew Fisher; Ian Burns; Llyan Smith
Subject: OEH Response Planning Proposal in Boundary Road Moama

Warwick,
While OEH will make formal comment on the final Planning Proposal when referred to us by Council, we offer the following comments in response to your enquiry.

1. Minor significance.
   Your position appears to be that the 6000m^2 is a small proportion of the lot in question, and that rezoning this area to R2 will not be a major reduction to E3.
   This site was originally zoned E3 based on biodiversity value and flooding, given its proximity to the river.
   Biodiversity
   The change in zoning and associated reduction in minimum lot size to 1000m^2 will likely result in the removal of most of the native vegetation that currently exists on the site.
   Currently the site in question potentially provides habitat that may be important for a number of threatened species known to occur in the (see point 2 below).
   Flooding
   A portion of the site is within the Flood Planning Area defined in the Murray LEP 2011. It is also within Flood Planning Area 1 as defined in the Murray DCP 2012.
   The site appears to be on the edge of the 1% Annual Exceedance Probability flood event, so you should be able to demonstrate that it has minor significance.
   However, you should be aware that we will be recommending to Murray River Council that they consider whether to approve proposals such as this before completing an updated Flood Risk Management Study and Plan. It is our contention that planning decisions in flood prone areas should be based on up-to-date information.

2. Use of the RMS bridge report.
   The RMS report covers the area immediately to the east of this proposed rezoning. While it provides an indication of the vegetation present and its condition, aerial imagery indicates that there is native vegetation on the site, likely including a number of large trees which may have hollows. These may provide habitat for native fauna, including threatened species. The RMS report documented a number of species listed under the *Threatened Species Conservation Act 1995* as being present on nearby land, including the Squirrel Glider which was recorded less than 100 metres to the east of the site proposed for rezoning. So the RMS report can be taken as indicative but we would want to see a thorough field assessment by a qualified ecologist completed for this proposal, to inform an Assessment of Significance and if required a Species Impact Statement.

   In addition, potential impacts on Aboriginal cultural heritage (ACH) need to be assessed. The proposed rezoning with reduction in minimum lot size to 1000m^2 will lead to tree removal as properties are developed and this is likely to involve ground disturbance. This is in an area close to the Murray River and associated billabongs, with known Aboriginal sites less than one kilometre from the proposal site. The RMS bridge project documented six known Aboriginal sites and recorded three new scarred trees.
   The proponent needs to ensure that all reasonable precautions are taken to prevent the occurrence of damage to Aboriginal objects (known and unknown). Attention is drawn to the Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW (the Code) and in particular the generic Due Diligence process on pages 10-14 of the Code. Anyone who exercises due diligence in determining that their actions will not harm Aboriginal objects has a defence against prosecution for the strict liability offence if they later harm an object. Further information on the code is available at the OEH website www.environment.nsw.gov.au/resources/cultureheritage/ddcop/10798ddcop.pdf.

While an assessment in accordance with the Due Diligence Code of Practice is only required as a defence in case of harm to an Aboriginal object/site, we recommend that the Planning Proposal provides sufficient and consistent information to ensure that impacts to ACH have been adequately addressed. As stated on Page 9 of the Code, OEH "will not approve or certify a person's compliance with their due diligence requirements carried out under this or any other code".

OEH notes that no prior archaeological assessment has occurred across the subject site and consider that any ground disturbance activities or tree removal associated with the development have the potential to impact ACH where it may occur at the subject site. OEH recommends that the proponent undertake an assessment in accordance with the Code, inclusive of a visual inspection undertaken by a person/s with expertise in locating and identifying Aboriginal sites and objects:

1. To identify whether or not Aboriginal objects are, or are likely to be, present in the proposed development area;
2. To determine whether or not the proposed activities are likely to harm Aboriginal objects (if present); and
3. To determine whether further assessment in the form of an Aboriginal Cultural Heritage Assessment (ACHA) and/or an Aboriginal Heritage Impact Permit (AHIP) application is required.

While it is noted that the proposal is only to change the zoning we recommend that the biodiversity and ACH assessments be undertaken at the planning proposal stage to give greater clarity of the potential impacts, and to also ensure that future proponents and consent authorities have adequate information to address the potential impacts of any future development within the rezoned land.

Please contact me if you have any questions about this response.
Thanks,
Peter

Peter Ewin
Senior Team Leader Planning, South West
Regional Operations Division
Office of Environment and Heritage
Ph: 02 6022 0606
Fax: 02 6022 0610
Mob: 0427 433 937

From: Warwick Horsfall [mailto:Warwick@habitatplanning.com.au]
Sent: Wednesday, 15 March 2017 3:18 PM
To: Peter Ewin <Peter.Ewin@environment.nsw.gov.au>
Cc: Llyan Smith <lsmith@murrayriver.nsw.gov.au>
Subject: Planning Proposal in Boundary Road Moama

A Gateway Determination has been issued by the Department of Planning and Environment (Ref: PP_2016_MRIVE_003_00) Peter to rezone approximately 6,000m^2 of E3 zoned land in Boundary Road Moama to R2 Low Density Residential with a minimum lot size for subdivision of 1,000m^2. The subject land is part of Lot 26 in DP751152.

Prior to proceeding further with the Planning Proposal, it is a condition of the Gateway Determination for the NSW Office of Environment and Heritage to be consulted in regards to compliance with Section 117 Ministerial Direction *2.1 Environment Protection Zones*. The proposal is considered to be inconsistent with this Direction because it proposes a change to a development standard (minimum lot size). I wanted to sound you out on two approaches to justifying the inconsistency.

1. Within the overall scheme of things, it is a small piece of land (6,000m^2) abutting an urban zoning and on that basis the proposal can be considered to be of "*minor significance*", or
2. There has been an extensive volume of environmental assessment work recently undertaken for the new bridge between Echuca and Moama (an example of which is attached). The route for the bridge abuts the subject land and for all intents and purposes has the same environmental characteristics. Hence could this work be relied upon for an assessment of the subject land?

Attached for your reference is a plan showing the location and extent of land proposed for rezoning.

If you require any additional information please let me know.

Regards

Warwick Horsfall

habitat planning

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NSW RURAL FIRE SERVICE

NSW GOVERNMENT

Habitat Planning
Suite 1, 662 Macauley Street
ALBURY NSW 2640

Your Ref: PP_2016_MRIVE_003_00
Our Ref: R16/966
ATTENTION: Warwick Horsfall
19 October 2017

Dear Warwick

Consultation NSW RFS – Planning Proposal at Boundary Road Moama - (PP_2016_MRIVE_003_00), Lot 26 DP 751152

I refer to your correspondence seeking comment from the NSW Rural Fire Service (RFS) on the abovementioned Planning Proposal, Gateway Determination issued by the Department of Planning and Environment.

1. The proposal seeks to rezone the northern portion of the subject lot from E3 Environmental Management to R2 Residential Low Density and reduce the minimum lots size from 120 hectares to 1000 hectares.

2. The NSW Rural Fire Service is of the opinion that the proposal will be able to demonstrate future compliance with Planning for Bush Fire Protection (PBP) 2006 and therefore does not object to the progression of the planning proposal. However, the following comments should be carefully considered by the applicant, Council and the Department of Planning and Environment before finalising the proposal:

- As Council is aware, future development applications on bush fire prone land will be required to comply with either Section 79BA of the Environmental Planning and Assessment Act 1979 or Section 100B of the Rural Fires Act 1997 depending upon the nature of the proposed development.

- A preliminary assessment of the site finds it is likely that future residential development will require a minimum 21 metre asset protection zone (APZ) to the east, south and west to allow future

dwellings to be constructed to Bushfire Attack Level (BAL) 29 under AS3959-2009 'Construction of Buildings in Bush Fire-prone land'.

Note - No dwellings or structures associated with dwellings including class 10a structures located within 10m of the dwelling should be located within the APZ.

- In recognition that the maximum lot yield resulting from the proposal will be six residential lots, the NSW RFS is satisfied that the required APZs, suitable access and provision of services complying with PBP 2006 can be provided as part of the future subdivision application, under Section 100B of the Rural Fires Act 1997.

For any enquiries regarding this correspondence or to discuss the matters raised in this letter further please contact Martha Dotter on (02) 4472 0600.

Yours faithfully,

Amanda Moylan

Team Leader – Development Assessment and Planning

Warwick Horsfall

From: MORGAN Maurice W <Maurice.MORGAN@rms.nsw.gov.au>
Sent: Monday, 24 July 2017 3:24 PM
To: Warwick Horsfall
Subject: RE: Planning Proposal Boundary Road Moama

Warwick

Given your indication that the proposed purpose of the rezoning land would for residential use of the subject lands and therefore may be sensitive to future road noise from the proposed Bridge it would be appropriate to consider this issue as part of the planning proposal rather than leaving it till DA stage.

Regards

Maurice Morgan
Manager Land Use
Regional & Freight
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www.rms.nsw.gov.au
Every journey matters

Roads and Maritime Services
193-195 Morgan Street, Wagga Wagga NSW 2650

From: Warwick Horsfall [mailto:Warwick@habitatplanning.com.au]
Sent: Monday, 24 July 2017 9:14 AM
To: MORGAN Maurice W
Cc: barry@nullarbortimber.com.au
Subject: RE: Planning Proposal Boundary Road Moama

Thanks Maurice. The proposed zoning is R2 with a MLS of 1,000m^2. This will yield 5 or 6 lots. Will you be looking for an acoustic assessment as part of the Planning Proposal or is it a DA matter?

Regards

Warwick Horsfall
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From: MORGAN Maurice W [mailto:Maurice.MORGAN@rms.nsw.gov.au]
Sent: Friday, 21 July 2017 5:04 PM
To: Warwick Horsfall
Subject: RE: Planning Proposal Boundary Road Moama

Warwick

I have no information relating to the proposed rezoning (for what use, etc) other than the site plan you have provided.

I note that the site is clear of the land required for the Echuca Bridge project. Note that noise sensitive land uses will need to address traffic noise from the new bridge route.

Note that Boundary Road to the east will be closed and there will be no access to the Echuca Bridge via Boundary Road.

Regards

Maurice Morgan
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From: Warwick Horsfall [mailto:Warwick@habitatplanning.com.au]
Sent: Friday, 21 July 2017 4:50 PM
To: MORGAN Maurice W
Cc: barry@nullarbortimber.com.au
Subject: FW: Planning Proposal Boundary Road Moama

Have you had a chance to look at this yet Maurice?

Regards

Warwick Horsfall

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From: Warwick Horsfall
Sent: Tuesday, 4 July 2017 4:20 PM
To: 'maurice.morgan@rms.nsw.gov.au'
Subject: Planning Proposal Boundary Road Moama

This Planning Proposal is crawling along Maurice. Before I embark on some specialist studies requested by OEH, could you please just cast your eye over the subject land. I'm not sure whether you are aware or not, but the area has been contracted to be completely clear of the land acquired by the RMS for the bridge approach (see attached). Can you see any immediate show stoppers from your perspective?

A revised Planning Proposal will be forwarded to you for comment prior to going back to DPE for endorsement and subsequent exhibition.

Give me a call if you wish to discuss further.

Regards

Warwick Horsfall

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Attachment F

Consistency with Standards for Bush Fire Protection Measures for Residential Subdivision[3]

[3] Section 4.1.3 of Planning for Bush Fire Protection (RFS 2006)

Performance Criteria	Acceptable Solutions	Response
The intent of the protection measures may be achieved where:		
in relation to Asset Protection Zones: ▪ radiant heat levels at any point on a proposed building will not exceed 29 kW/m2	▪ An APZ is provided in accordance with the relevant tables/figures in Appendix 2 of the Guideline.	▪ The APZ has been calculated at 10 metres using 'woodland (grassy)' as the vegetation type in the APZ Calculator and applied to the future subdivision of the land.
▪ APZs are managed and maintained to prevent the spread of a fire towards the building.	▪ The APZ is wholly within the boundaries of the development site. Exceptional circumstances may apply (see section 3.3) in accordance with the requirements of Standards for Asset Protection Zones (RFS, 2005).	▪ An APZ can be accommodated wholly within the subject land.
▪ APZ maintenance is practical, soil stability is not compromised and the potential for crown fires is negated	▪ The APZ is located on lands with a slope less than 18 degrees.	▪ Compliant.
in relation to public roads: ▪ fire fighters are provided with safe all-weather access to structures (thus allowing more efficient use of fire fighting resources)	▪ Public roads are two-wheel drive, all-weather roads. ▪ Public roads up to 6.5 metres wide provide parking within parking bays and locate services outside of the parking bays to ensure accessibility to reticulated water for fire suppression.	▪ The subject land has frontage to Twenty-four Lane and Beer Road in Moama. Internal roads will be constructed in accordance with Council's design standards for urban residential subdivision. ▪ The design of the future subdivision will comply with the minimum standard. This will be confirmed with an application for a Bush Fire Safety Authority accompanying the development application for subdivision.

Performance Criteria	Acceptable Solutions	Response
▪ public road widths and design that allow safe access for fire fighters while residents are evacuating an area.	▪ Urban perimeter roads are two-way, that is, at least two traffic lane widths (carriageway 8 metres minimum kerb to kerb), allowing traffic to pass in opposite directions. Non perimeter roads comply with Table 4.1 – Road widths for Category 1 Tanker (Medium Rigid Vehicle). ▪ The perimeter road is linked to the internal road system at an interval of no greater than 500 metres in urban areas. ▪ Traffic management devices are constructed to facilitate access by emergency services vehicles. ▪ Public roads have a cross fall not exceeding 3 degrees. ▪ All roads are through roads. Dead end roads are not recommended, but if unavoidable, dead ends are not more than 200 metres in length, incorporate a minimum 12 metres outer radius turning circle, and are clearly sign posted as a dead end and direct traffic away from the hazard. ▪ Curves of roads (other than perimeter roads) are a minimum inner radius of six metres and minimal in number, to allow for rapid access and egress. ▪ The minimum distance between inner and outer curves is six metres. ▪ Maximum grades for sealed roads do not exceed 15 degrees and an average grade of not more than 10 degrees or other gradient specified by road design standards, whichever is the lesser gradient. ▪ There is a minimum vertical clearance to a height of four metres above the road at all times.	▪ The design of the roads within the future subdivision will comply with these minimum standards. This will be confirmed with an application for a Bush Fire Safety Authority accompanying the development application for subdivision.
▪ the capacity of road surfaces and bridges is sufficient to carry fully loaded fire fighting vehicles.	▪ The capacity of road surfaces and bridges is sufficient to carry fully loaded fire fighting vehicles (approximately 15 tonnes for areas with reticulated water, 28 tonnes or 9 tonnes per axle for all other areas). Bridges clearly indicate load rating.	▪ No bridges will be required in the future subdivision.
▪ roads that are clearly sign-posted (with easily distinguishable names) and buildings/properties that are clearly numbered.	▪ Public roads greater than 6.5 metres wide to locate hydrants outside of parking reserves to ensure accessibility to reticulated water for fire suppression. ▪ Public roads between 6.5 metres and 8 metres wide are 'No Parking' on one side with the services (hydrants) located on this side to ensure accessibility to reticulated water for fire suppression.	▪ The design of the roads within the future subdivision will comply with these minimum standards. This will be confirmed with an application for a Bush Fire Safety Authority accompanying the development application for subdivision.

Performance Criteria	Acceptable Solutions	Response
▪ there is clear access to reticulated water supply	▪ Public roads greater than 6.5 metres wide to locate hydrants outside of parking reserves to ensure accessibility to reticulated water for fire suppression. ▪ One-way only public access roads are no less than 3.5 metres wide and provide parking within parking bays and locate services outside of the parking bays to ensure accessibility to reticulated water for fire suppression.	▪ A reticulated water supply for fire suppression will be provided to the subject land. ▪ No one-way access roads are planned for the subject land.
▪ parking does not obstruct the minimum paved width	▪ Parking bays are a minimum of 2.6 metres wide from kerb edge to road pavement. No services or hydrants are located within the parking bays. ▪ Public roads directly interfacing the bush fire hazard vegetation provide roll top kerbing to the hazard side of the road.	▪ The design of the roads within the future subdivision will comply with these minimum standards. This will be confirmed with an application for a Bush Fire Safety Authority accompanying the development application for subdivision.
in relation to property access:		
▪ access to properties is provided in recognition of the risk to fire fighters and/ or evacuating occupants.	▪ At least one alternative property access road is provided for individual dwellings (or groups of dwellings) that are located more than 200 metres from a public through road.	▪ More than one access shall be provided to the subject land from the adjoining subdivision.
▪ the capacity of road surfaces and bridges is sufficient to carry fully loaded fire fighting vehicles. ▪ all-weather access is provided.	▪ Bridges clearly indicate load rating and pavements and bridges are capable of carrying a load of 15 tonnes ▪ Roads do not traverse a wetland or other land potentially subject to periodic inundation (other than a flood or storm surge).	▪ No bridges will be required in the future subdivision and none need to be crossed tom access the land.

Performance Criteria	Acceptable Solutions	Response
▪ road widths and design enable safe access for vehicles	▪ A minimum carriageway width of four metres for rural-residential areas, rural landholdings or urban areas with a distance of greater than 70 metres from the nearest hydrant point to the most external part of a proposed building (or footprint). Note: No specific access requirements apply in a urban area where a 70 metres unobstructed path can be demonstrated between the most distant external part of the proposed dwelling and the nearest part of the public access road (where the road speed limit is not greater than 70kph) that supports the operational use of emergency fire fighting vehicles (i.e. a hydrant or water supply). ▪ In forest, woodland and heath situations, rural property access roads have passing bays every 200 metres that are 20 metres long by two metres wide, making a minimum trafficable width of six metres at the passing bay. ▪ A minimum vertical clearance of four metres to any overhanging obstructions, including tree branches. ▪ Internal roads for rural properties provide a loop road around any dwelling or incorporate a turning circle with a minimum 12 metre outer radius. ▪ Curves have a minimum inner radius of six metres and are minimal in number to allow for rapid access and egress. ▪ The minimum distance between inner and outer curves is six metres. ▪ The crossfall is not more than 10 degrees. ▪ Maximum grades for sealed roads do not exceed 15 degrees and not more than 10 degrees for unsealed roads. Note: Some short constrictions in the access may be accepted where they are not less than the minimum (3.5m), extend for no more than 30m and where the obstruction cannot be reasonably avoided or removed. The gradients applicable to public roads also apply to community style development property access roads in addition to the above. ▪ Access to a development comprising more than three dwellings have formalised access by dedication of a road and not by right-of-way.	▪ The design of the roads within the future subdivision will comply with these minimum standards. This will be confirmed with an application for a Bush Fire Safety Authority accompanying the development application for subdivision.

Attachment G

Biodiversity Impact Assessment

Biodiversity Assessment for a Rezoning Application Part of Lot 26, Boundary Road Moama NSW 2731

(B. Donchi)

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CREATING A SUSTAINABLE FUTURE

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Assessor Details	
Name of investigating company	Advanced Environmental Systems P/L (AES)
Nominated individual/s	Mr Peter Clinnick (B. Ag. Sci. Hons. MASSSI)
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Authors' Expertise - Peter Clinnick has a Degree in Agricultural Science with Honours from La Trobe University and is a recognized ecologist/soil scientist and member of the Soil Science Society of Australia since 1980. He has been engaged by CSIRO Forestry, industry, community groups and local government to work in extension, research and statutory planning throughout Australia. Peter has over 30 year's experience in biodiversity, soils and geomorphology assessments for rural landholders, developers and utilities. Peter is currently Managing Director of the regionally based environmental consulting company Advanced Environmental Systems Pty Ltd.

Disclaimer

This report has been prepared based on the information available to AES – Advanced Environmental Systems at the time and represents to the best of AES's knowledge and the client's intentions at the time of printing of the document. The assessment of potential issues and impacts and conclusions drawn reflect our best judgment, based on that information. Although all possible care is taken, AES – Advanced Environmental Systems Pty Ltd, together with its employees accepts no responsibility for any resultant errors contained herein and any damage or loss, howsoever caused, and suffered by any individual or corporation.

Table of Contents

Report Checklist

Location map.	Yes	P5
Aerial photograph of the proposed development site.	Yes	P6
Complete plant list categorised according to whether they are native or exotic.	Yes	Appendix 2, P35
Description of vegetation structure.	Yes	P14
Description of the condition and integrity of the vegetation.	Yes	Appendix 4, P58
Assessment of the plant communities and if they have adequate representation in conservation reserves or are otherwise protected.	Yes	P16
Vertebrate fauna list (including the scientific names).	Yes	Appendix 2, P35
Vertebrate fauna species which are protected threatened or listed under any international agreement.	Yes	P26
A list of those vertebrate fauna species known or likely to breed in the area.	Yes	Appendix 2, P35
A list of vertebrate fauna species which have specific habitat requirements within the area.	Yes	P24
A list of known or likely threatened species (flora and fauna) as listed under Schedules 1 and 2 (*Threatened Species Conservation Act 1995*) which might occur at the site.	Yes	P21, P26
Assessment of the requirements of SEPP No. 44 Koala Habitat Protection	Yes	
'Seven Part Test of Significance' for threatened flora and fauna recorded or likely to be recorded on the development site.	Yes	P21, P26
Assessment of the significance of the impact of the development at both the site and at the regional scale on flora and fauna.	Yes	P19, P24

Executive Summary

This report has been provided as support for an Application to Murray River Council for rezoning of the subject land from Environmental Management (E3) to Residential (R2) on part of Lot 26 (~0.43 ha), located on the south side of Boundary Road in Moama township.

The biodiversity study has also been conducted following specific concerns raised by the Office of Environment and Heritage regarding the potential of the site, to contain threatened species. In particular, the squirrel glider, which has been recorded within 100 m of the site.

This report provides information based on site inspection and area investigations into biodiversity including habitat, flora and fauna and provides mitigation measures to address relevant environmental issues at the site of the proposed rezoning. The report was prepared following field investigations and database /literature research relating to the site.

The key findings with regard to **flora** are:

1. The indigeneous overstory vegetation consists predominantly of Black box (*Eucalyptus largiflorens*), as well as Red gums (*E. camaldulensis*) and a large Gey box (*E. microcarpa*) on Boundary Road. These trees should be retained and maintained to contribute to the well-being of local fauna.
2. There is very limited native flora diversity within the proposed rezoning area.
3. The only possibly threatened flora species listed as Vulnerable is the Slender Darling-pea (*Swainsonia murrayana*). The species was not found on the site and is not recorded within 10 km of the site.
4. Several remnant trees contribute to the significant habitat value of the area.

The key findings with regard to **fauna** are:

1. There is very limited fauna diversity within the proposed rezoning area. Although the adjacent forest area is potentially rich in a range of species.
2. The adjacent Red gum-Black box woodland forms a significant habitat for local bird and other wildlife (e.g. goannas).
3. There were no threatened fauna species found in the immediated vicinity (50 m) or within the 0.43 ha area, or on the roadside areas.
4. There are no observable hollows present in the study site vegetation that would provide breeding habitat for threatened species, such as the Squirrel glider (refer P23).

Recommendation:

1. Rezoning and associated development could be considered providing the remnant Red gum and Black box trees along the southern bounday of the area are retained.

Biodiversity Assessment

for a Rezoning Application

Part of Lot 26Boundary Road, Moama, NSW 2731

Introduction

This report provides information on biodiversity including habitat, flora and fauna together with mitigation measures to address relevant environmental issues at the site of the proposed rezoning from Environmental Management (E3) to Residential (R2) of land at Lot 26 Boundary Road, Moama (~0.43 ha Figure 1).

The biodiversity (flora and fauna) assessment has been prepared in order to satisfy the requirements of the NSW Environment and Planning Assessment Act 1979 (EP&A Act) and Threatened Species Conservation (TSC) Act 1995 which identifies and protects native plants and animals in danger of becoming extinct. The TSC Act also provides for species recovery and threat abatement programs where required.

The report was compiled following flora and fauna field investigations and database research relating to the site.

The site is comprised of a flat upper river terrace with a 1.5 m sloping drop off on the southern boundary in the direction of the Murray River floodplain. The site was probably cleared in the late 1800's and most of the existing trees have regrown as grazing pressure was reduced with town development.

The site is situated close to the Murray River (~500 m), the river's classification as an Endangered Ecological Community (EEC) (DPI 2017) means that off-site impacts must be considered in relation to the river.

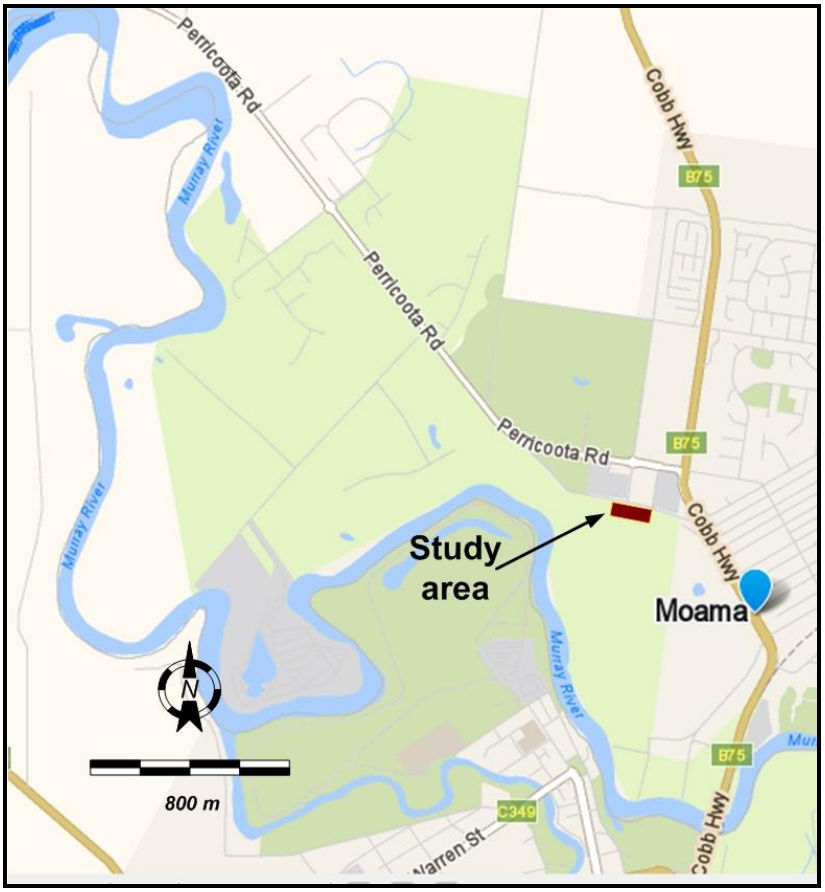

Figure 1. Locality plan and site location

Figure 2. Lot 26 Boundary Road, Moama rezoning area

Threatened species listed under the NSW TSC Act and located within the Murray River Council-Riverina Bioregion (previously Murray Shire Council area) consist of forty-one fauna species considered vulnerable and nine considered endangered and one critically endangered; while for flora there are two vulnerable and three endangered species (NPWS Wildlife Atlas 2017).

Figure 3. Lot 26 Boundary Road, Moama upper river terrace (view east)

Figure 4. Lot 26 Boundary Road, Moama upper river terrace (view west)

1. Policy and Planning Instruments

There are a number of State, regional, local policy and planning instruments guiding development and protection of habitat in the Murray River Council area.

It should be noted that references to Murray River Council in the context of this report are limited to the geographic area that was previously the Murray Shire Council and does not include what was prevoiously Wakool Council area.

1.1 Policy Framework

Commonwealth Environment and Biodiversity Conservation (EPBC) Act 1999

The *Environment and Biodiversity Conservation Act 1999* contains a list of threatened and migratory species together with ecological communities. If there is the potential for a significant impact on nationally threatened species, or listed migratory species, or communities, then the species and communities listed need to be considered in relation to planning and development matters. Under the Act a referral to the Minister should be considered.

Environment and Planning Assessment Act 1979

The NSW Regulatory framework in relation to flora and fauna is governed by the Environment and Planning Assessment Act 1979. The Act provides for a Seven Part Test, which determines if a Species Impact Statement should be prepared under the Threatened Species Conservation (TSC) Act 1995. If threatened species are confirmed or likely to be in an area, the Seven Part Test should be applied.

The objects of the TSC Act are as follows:

(a) Conserve biological diversity and promote ecologically sustainable development;

(b) Prevent the extinction and promote the recovery of threatened species, populations and ecological communities;

(c) Protect the critical habitat of those threatened species, populations and ecological communities that are endangered;

(d) Eliminate or manage certain processes that threaten the survival or evolutionary development of threatened species, populations and ecological communities;

(e) Ensure that the impact of any action affecting threatened species, populations and ecological communities is properly assessed; and

(f) Encourage the conservation of threatened species, populations and ecological communities by the adoption of measures involving co-operative management.

NSW Fisheries Management Act 1994 The natural drainage system of the Lower Murray River Catchment has been listed as an Endangered Ecological Community in Part 3 of Schedule 4 of the Act. This means that it is likely to become extinct in nature in this state, unless the circumstances and factors threatening its survival and evolutionary development cease to operate. Activities, such as housing developments, can have significant impacts unless mitigation measures are undertaken (Table 4). Included in the recommendation are all natural creeks, rivers, and associated lagoons, billabongs and lakes of the regulated portions of the Murray River downstream of Hume Weir.

The Aquatic Ecological Community of the Lower Murray River drainage system has been greatly modified since European settlement, through activities such as river regulation, agricultural practices and the introduction of non-native plant and animal species.

1.2 Planning Framework

Planning overlays of potential relevance to the development and more particularly habitat protection include the Murray River Council Strategic Land Use Plan (SLUP 2010), the Local Environment Plan (LEP 2011), the Development Control Plan (DCP 2012) that reinforce the aims and objectives of the Murray Regional Environmental Plan No 2 (MREP 2009).

The land proposed for development is zoned E3 – Environmental Management under the Murray River Council Local Environmental Plan (LEP) 2011. A biodiversity overlay covers part of the vegetation in the study area (Figure 5).

Murray Regional Environmental Plan No 2

Murray Regional Environmental Plan No 2 (MREP No 2) - Riverine Land (Environmental Planning and Assessment Act 1979). Regulation 8 of the MREP No 2 applies when:

1) Council prepares any Local Environmental Plan (LEP), or
2) A consent authority determines a development application, or
3) A public authority or person proposes to carry out development, which does not require development consent, but which has the potential to adversely affect the riverine environment of the Murray River.

The objectives of the MREP No 2 are:

1) To ensure that appropriate consideration is given to development with the potential to adversely affect the riverine environment of the Murray River, and
2) To establish a consistent and co-ordinated approach to environmental planning and assessment along the River Murray, and to conserve and promote the better

management of the natural and cultural heritage values of the riverine environment of the Murray River.

Within the context of the proposal appropriate consideration will need to be given to the development design, so that rather than adverse effects, favourable outcomes are generated for the riverine and floodplain environment. For example, the development will need to incorporate water quality protection measures in relation to management of runoff and erosion from the subject land and associated hard surfaces.

Strategic Land Use Plan (SLUP)

The Strategic Land Use Plan (SLUP) indicates that the major part of the subject area is not subject to flooding.

A small part of the property is within the aforementioned Council's Planning Scheme Biodiversity Overlay (Figure 5). The overlay allows for protection of important biodiversity areas whilst, in turn, streamlining development considerations outside the areas of importance.

The Black box and Red gum vegetation contained within the overlay does have habitat value in terms of foraging opportunities and nesting sites for the resident flock of White-winged choughs (*Corcorax melanorhamphos*) and other branch nesting species.

Murray Local Environmental Plan (LEP) 2011

Planning decisions within Murray River Council are principally controlled by the provisions of the LEP this includes biodiversity protection.

(1) The objective of the clause is to maintain aquatic and terrestrial biodiversity by:
   (a) Protecting native fauna and flora,
   (b) Protecting the ecological processes necessary for their continued existence,
   (c) Encouraging the recovery of native fauna and flora and their habitats.

(2) Before determining a development application for development on land to which this clause applies, the consent authority must consider whether or not the development:
   (a) Is likely to have any adverse impact on the condition, ecological value and significance of the fauna and flora on the land, and
   (b) Is likely to have any adverse impact on the importance of the vegetation on the land to the habitat and survival of native fauna, and
   (c) Has any potential to fragment, disturb or diminish the biodiversity structure, function and composition of the land, and
   (d) Is likely to have any adverse impact on the habitat elements providing connectivity on the land.

(3) 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.

In relation to the above points the vast majority of (~80%) of the area to be developed, has been cleared or has introduced native and non-native tree species. Consequently, much of the rezoning area is of very low ecological value. Any adverse effect on the ecological value and the flora and fauna will be minimal in a landscape context.

Murray Development Control Plan (2012)

The Murray Development Control Plan (DCP) 2012 provides for the community an indication of Council's preferred approach to acceptable standards for development within the Murray River Council. Several chapters of the DCP are relevant to the development, but in the context of flora and fauna, protection of vegetation are considered to be the most important matters. .

The key objectives of the Murray Shire's Development Control Plan (DCP) in relation to residential rezoning area are:

- To provide for a variety of residential development that caters for the housing needs of local residents;
- Encourage dwelling design that has minimal impact on adjoining neighbours;
- Ensure that residential buildings offer visual interest in their appearance and style;
- Make sure that new development is sympathetic with the established form of an area to ensure that neighbourhoods with distinct character are developed over time.
- Ensure that new residential development is consistent with the desired future form and density of an area.
- Encourage residential development that is respectful of the character of areas which are developed over time.

Provided native vegetation (trees >15 cm DBH) at the southern side of the study site are protected the development of the land could meet of the key objectives of the DCP.

2. Natural Features, Land Use and Planning

2.1 Topography, Geomorphology and Land Use

The site topography of the proposed rezoning area is gently sloping (2-3%) with a southerly aspect and a steeper sloping bank leading to a lower (~1.5 m) river floodplain on the southern boundary of the proposed subdivision area.

The ancestral Murray River originally followed a path along Green Gully near Mathoura. Uplift of the Cadell Fault redirected the river to what is now the Edwards River (Harris 1939; Bowler 1978). In more recent geological time the river has taken a course that dissects the floor of a palaeolake (old Lake Kanyapella) and has then followed the ancestral Goulburn River. Stone (2006) conducted a study of the Moira Lakes and Murray River – Barmah Choke and concluded that the river in the Echuca–Moama area was only ~550 years old. Moreover, the steep gradient of the river has all but precluded the deposition of sediments in the area of recent avulsion.

The site was previously used for a residence and a sawmill, processing local red gum timber. Surrounding land uses include a shopping center to the north, a residence to the east and recreational–forest area on the southern boundary of the study area. There is a newly constructed residence located on the western portion of Lot 26.

3. Biodiversity Context and the Endangered Ecological Communities

The Moama subdivision site is located in a biogeographical region with recognised biodiversity values. Black box (*Eucalyptus largiflorens*) and Red gum (*E. camaldulensis*) woodland has largely been preserved due to the difficulty in utilizing flood prone areas. This is evident in Figures 3 and 4 where the elevated areas have been cleared and used for a range of uses in the past.

In NSW the Black box-Red gum community occurs largely in association with the Tertiary and Quaternary alluvial Grey-Brown Vertosols of the floodplains. The more elevated portion of the study area is a different soil type typical of the Red Brown earth (Sodosols) of the western slopes and plains of NSW. The Black box-Red gum community generally occurs where average rainfall is 375-800 mm p.a. and the mean maximum annual temperature is 22- 26°C.

Murray River Council together with the Office of Environment and Heritage have mapped areas in the Council area with high biodiversity values (Figure 5). Although it has been

substantially modified, the area does contain some environmentally significant remnant trees (Figures 1 and 2) providing potential habitat for various threatened fauna and contributing to the intrinsic natural values of the area.

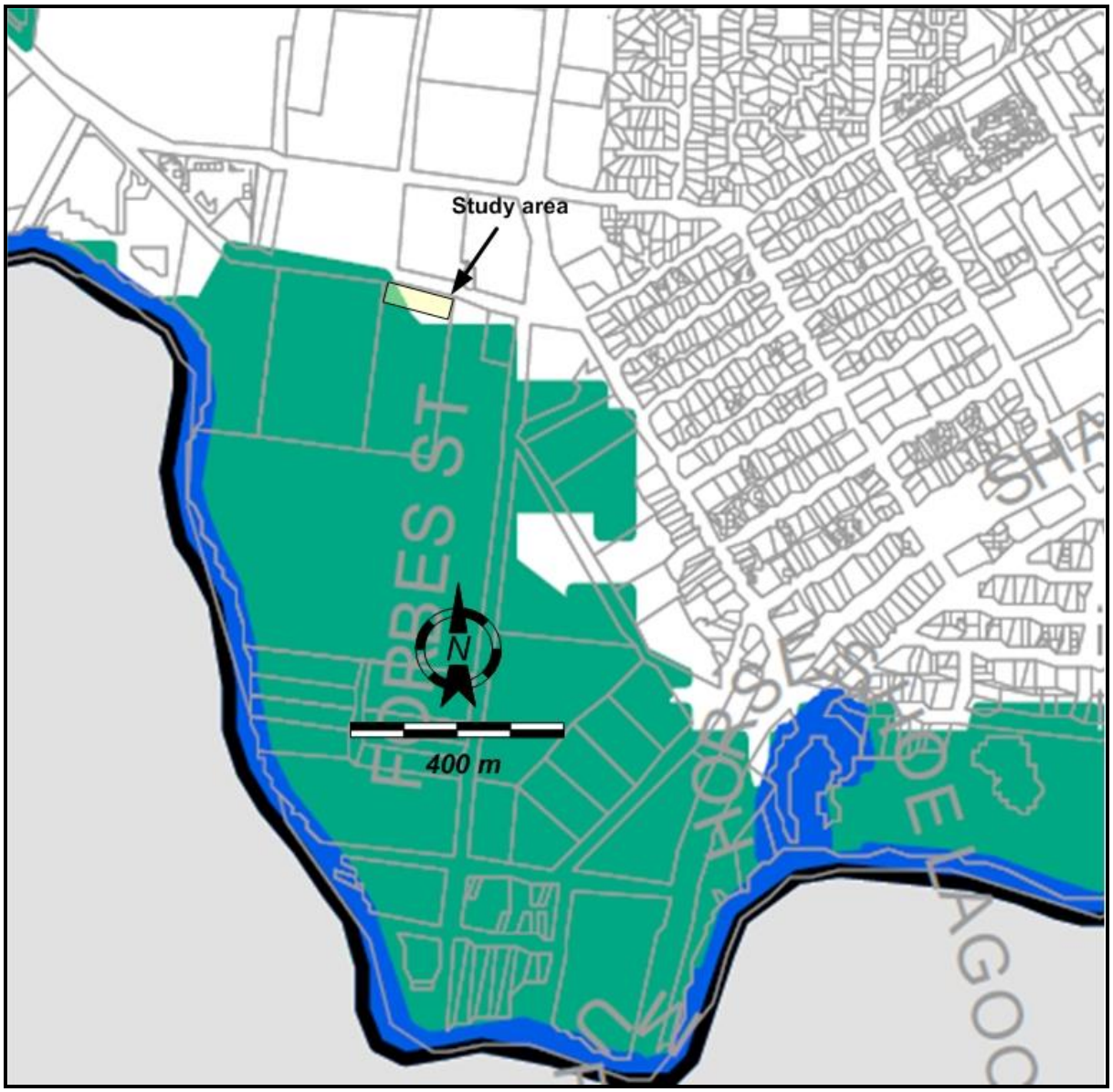

Figure 5. Biodiversity mapping (Green area)

Critical Habitat Elements

The Black box-Red gum woodlands provide valuable habitat for those animal species that are either resident or transient visitors, in particular they support fauna, especially birds from more temperate forest and woodland ecosystems, as well as species from the drier inland semi-arid environments. Important habitat features include hollows of all sizes, dead standing trees, thickets of trees and shrubs, fallen timber, fine litter and open grassy areas.

The typical vegetation structure is a woodland to open forest with a canopy of mostly eucalypts and an understory of moderately dense to sparse shrub layer, and a ground layer of perennial and annual native herbs and grasses.

The tree canopy is dominated by River red gums (*Eucalyptus camaldulensis)* and Black box (*E. largiflorens*), but occassioanally can also include trees such as Grey box (*E. microcarpa*). The mid layer can include a range of shrubs including Silver wattle (e.g. *Acacia dealbata*) and Lignum (*Muehlenbeckia florulenta*). The ground layer includes grasses Wallaby grass (*Austrodanthonia spp)* and a range of small shrubs and groundcovers, such as Nardoo (*Marsilea drummondii*) and small saltbush species, for example Ruby saltbush (*Enchylaena tomentose*) (Appendix 2).

In order to best preserve the existing specimens of Black box and Red gum, it is important to understand the critical factors and processes affecting their survival.

The impact of agriculture has meant that previously trees have been partly or wholly removed. Some remnants of the community, such as those on the southern boundary of the subject site, survived with trees largely intact, but with the shrub or ground layers degraded to varying degrees through grazing or other forms of modification. Remnants are subject to various processes of degradation that have led to a large reduction in ecological functioning; some processes include:

- Clearing for cropping, pasture improvement or other developments, such as roading;
- Firewood cutting, increased livestock grazing, weed invasion, inappropriate fire regimes, soil disturbance and increased nutrient loads;
- Degradation of the landscape including track grading, soil acidification, sheet erosion, soil scalding and loss of connectivity;
- Loss of structural integrity, such that individual trees are subject to climatic extremes and storm impacts.

4. Flora and Fauna Assessment

4.1 Methodology

The area was assessed using guidelines and procedures relating to the Commonwealth EPBC Act 1999, Environment and Planning Assessment Act 1979 and the Threatened Species Conservation Act 1995.

The location of the proposed development site is provided in Figures 1 and 2. The flora and fauna assessment of the site was undertaken on 12 and 30th August 2017.

The following methodologies were adopted to survey the flora and fauna on the site of the proposed facility:

- Flora and fauna transects/searches;
- Records made of birds and other animal species present at the time of the survey;
- Observation of predator and native species scats;
- A search of the New South Wales Wildlife Atlas database.

In relation to the rezoning area individual tree assessment methodology was based on parameters including tree height, tree diameter, canopy diameter, foliage cover, hollows, any logs on the ground, ground cover and any intermediate species present. The condition of each large tree greater than 10 cm diameter at ~1.4 m height and habitat characteristics can be found in Appendix 4.

Trees on Boundary Road were not assessed in detail, because no clearing is planned for the road reserve. Non-indigenous trees, which are numerous within the study area, were not included in the assessment. The investigation and assessment takes into account species occurring within the locality (10 km), as well as species that are likely to be, or were found on the study area.

A study of particular relevance is the work conducted by Lane (2013) for construction of the Echuca–Moama Mid West 2 Bridge Option.

3.2 Results

Table 1. Description of Habitat Zone

Vegetation Type	% cleared in Murray CMA	Description
River Red Gum - Black Box woodland of the semi-arid (warm) climatic zone	45%	River Redgum - Black Box. Canopy sparse with moderate cover of eucalypt regrowth. Understorey disturbed with tracks. Ground layer very sparse, mostly introduced grasses and weeds.

Woodland habitat

Prior to settlement it is likely that substantial parts of the property and roadsides were covered by Black box (*E. largiflorens*) and River red gum (*E. camaldulensis*) woodland with Grey box (*E. microcarpa*) on the elevated areas. In its natural state the site would have also contained wattles such as, Weeping myall (*Acacia pendula*), Mallee wattle (*A. montana*) and diverse range of other species including Wedge-leaf hopbush (*Dodonaea viscosa*). Similar representative communities can be found on the surrounding floodplain with remnants on the nearby roadsides and the river reserve.

There are 39 indigenous trees greater than 10 cm DBH (Diameter at breast height) on the rezoning area (Refer Appendix 4). The condition of the canopy on the trees within the property and on the road reserves is relatively healthy with up to 75 percent foliage cover (PFC) on some trees. There are also a few dead trees (<30 cm DBH) on the the southern boundary of the subdivision area.

Grassland habitat

Past grazing, slashing and machinery movement has eliminated native understory flora that might be considered as important habitat for native species. The cleared area covering the development site is dominated by Barley grass (*Hordeum leporinum*), Rye grass (*Lolium perenne*), Patterson's curse (*Echium plantagineum*), typical of heavily utrilized sites on the riverine plain. Native grasses are all but absent except for a few sporadic occurances of Wallaby grass (*Austrodanthonus Spp*) and Speargrass (*Austrostipa Spp*) where the presence of indigeneous trees have prevented machinery movement.

A complete flora list for the Murray River Council 1:100,000 mapsheet is provided in Appendix 3. A total of 459 species are recorded for Murray River Council. Species identified on and around the rezoning area and the wider agricultural area, as well as the roadside reserves are indicated by yellow shading in the flora list (Appendix 3). Other studies (NPNSW Wildlife Atlas 2017) found River swamp wallaby grass (*Amphibromus fluitans*) along the Murray River south of Meninya Street Moama ~3 km south-east of the study site. No suitable viable habitat for River swamp wallaby grass currently exists within the study area although it could occur in the nearby wetland.

A search (1/09/2017) of the Atlas of New South Wales Wildlife found no threatened species records for the proposed development site.

Lower Murray Ecological Community

The Lower Murray Ecological Community is listed as an **endangered ecological community** in NSW under the *Threatened Species Conservation Act 1995*. This means that it is likely to become extinct in nature, unless the circumstances and factors threatening its survival and evolutionary development cease to operate. The lower Murray River endangered ecological community includes all native fish and aquatic invertebrates within all natural creeks, rivers, and associated lagoons, billabongs and lakes of the regulated portions of the Murray River

Potential impacts on the ecological community must be considered during development assessment processes. One of the relevant threatening processes to the immediate area is degradation of the riparian (riverbank) zone through accelerated erosion and subsequent loss of native vegetation, leading to loss of shelter and increased sedimentation. Riparian

vegetation degradation along NSW watercourses has been listed as a Key Threatening Process because of its negative impacts on threatened species, populations and ecological communities listed under the Fisheries Management Act 1994.

Seven Part Test – Lower Murray Ecological Community

The following information addresses questions relating to the development footprint and potential impacts on the Murray River Ecological Community.

In the case of a threatened species, whether the action proposed is likely to have an adverse effect on the lifecycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.

No threatened flora or fauna species were identified on the site.

In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the lifecycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction.

There were no endangered populations of flora or fauna listed on the schedules of the *Threatened Species Conservation Act 1995* identified on the site.

In the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

- *Is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to placed at risk of extinction, or*
- *Is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction.*

There is no development planned, that will either place it at risk of extinction locally or modify the composition of the ecological community.

In relation to the habitat of a threatened species, population or ecological community:

- *The extent to which habitat is likely to be removed or modified as a result of the action proposed.*

Providing conditions are placed on native vegetation removal, the proposal will aid in the protection of the Red gum–Black box community.

- *Whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action.*

The development will not increase the isolation or fragmentation of existing habitat.

- *Connection to other areas.*

Protection of native tree species is likely to maintain the connectivity to other areas.

- *The importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality.*

Habitat for most species is likely to be maintained as a result of the development proposal.

- *Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly).*

There will be no critical habitat affected by the development proposal.

- *Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan.*

Since there will be no threat to native vegetation, no formal recovery plan or threat abatement plan is required.

- *Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of a key threatening process.*

The proposed development does not constitute part of any key threatening process. In fact, provided future development is consistent with controls outlined in the Council's DCP (2013) and there is a precautionary approach to the future management of the area, through the recommendations listed under mitigation measures, the current state of the ecological community is likely to be maintained.

Flora and fauna species

Flora species listed as vulnerable that could be encountered on the elevated area of the site and nearby floodplain include Slender Darling-pea (*Swainsonia murrayana*) and Western water starwort (*Callitriche cyclocarpa).*

Western water starwort has only been recorded in NSW on the floodway from the Murray to Wakool River, about 26 km NNW of Swan Hill. It also grows in Victoria in damp and swampy habitats, as well as River Red Gum (*Eucalyptus camaldulensis*) open woodland with an open grassy understorey dominated by Wallaby grasses (*Austrodanthonia setacea* and *A. caespitosa*) on ground less-frequently inundated.

Examples of vulnerable, near threatened or threatened fauna species listed in Victoria or NSW and possibly occurring (but not observed) in the area include the Superb parrot (*Polytelis swainsonii*), Barking owl (*Inox connivens*) and the Brown treecreeper (*Climacteris picumnus*) and Lane (2013) noted the presence of the Squirrel glider *(Petaurus norfolcensis)* less than 100 m from the site. This latter species is listed as Viulnerable under the TSC Act in NSW.

Commonwealth EPBC Act 1999, Environment and Planning Assessment Act 1979 and the Threatened Species Conservation Act 1995

As previously mentioned, in relation to the *Environment and Biodiversity Conservation Act 1999,* if there is the potential for a significant impact on nationally threatened species or communities, or listed migratory species, then under the Act a referral to the Minister should be considered.

In this case the development will not impact directly on any of the flora and fauna species listed under the Commonwealth EPBC Act 1999.

Threatened Flora

No threatened flora were identified as being present on the development footprint area, or on the adjacent roadside reserves. Within Murray River Council, the Atlas of NSW Wildlife lists ten protected (P13), vulnerable (V), endangered species (E1) or critically endangered flora species (E4A); these are listed below together with comments relating to the site or geographic proximity of the relevant species. Small scurf pea has also been considered even though not listed as having been found in the Murray River Council area.

Floating Swamp Wallaby-grass (*Amphibromus fluitans*) V – nearest record Moama 4 km SE. Mostly requires permanent water. No suitable, viable habitat on study site.

Lowly greenhood (*Pterostylis despectans*) E4A - The only known population is restricted to a small area within the Yellow Water Hole at Barnes Crossing Travelling Stock Reserve (TSR Riverina 120; about 12 km north-east of Moama).

Turnip copperburr (*Scleroleana napiformis*) E1 - Not observed on-site (Closest Barnes Crossing Cobb H'way).

Round–leaved wilsonia (*Wilsonia rotundifolia*) E1 - No suitably saline habitat (Closest Bunaloo).

Slender Darling-pea (*Swainsonia murrayana*) E1 - Not observed on-site. Slender Darling-pea has been recorded from heavy clay and clay loam soils including Bladder saltbush and grassland communities (Cunningham *et al.* 1992); (Closest Barnes Crossing).

Scented sun orchard (*Thelymitra megcalyptra*) E1 - Nearest recorded occurrence between Moama and Mathoura.

Small scurf pea (*Cullen parvum*) E1 - Not recorded in Murray River Council, although there is the potential for it to grow on the site in seasonally wet areas.

Table 2. Summary of Seven Part Test for Flora

Threatened Species Seven Part Test of Significance		*Adverse effect on lifecycle risk of extinction*	*Endangered population, likely to be placed at risk of extinction*	*In the case of an endangered ecological community or critically endangered ecological community, whether the action proposed will:*		*In relation to the habitat of a threatened species, population or ecological community*						*In relation to the habitat of a threatened species, population or ecological community*
				Have an adverse effect on the extent of the ecological community leading to extinction	*Substantially and adversely modify the composition of the ecological community leading to extinction*	*Extent to which habitat is likely to be removed or modified as a result of the action proposed*	*If habitat is to be fragmented or isolated from other areas of habitat as a result of the proposed action*	*Connecti on to other areas*	*Importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality*	*Any adverse effect on critical habitat*	*If action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan*	*If action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of a key threatening process*
Flora												
Amphibromus fluitans	Floating swamp wallaby-grass V	No	No	No	No	No	No	No	Any indigenous vegetation alteration or removal is not likely to affect the long-term survival of the species, population or ecological community in the locality.	No	No	No
Cullen parvum	Small scurf pea E1	No	No	No	No	No	No	No		No	No	No
Lepidium monoplocoides	Winged peppercress E1	No	No	No	No	No	No	No		No	No	No
Pterostylis despectans	Lowly greenhood E4A	No	No	No	No	No	No	No		No	No	No
Sclerolaena napiformis	Turnip copperburr E1	No	No	No	No	No	No	No		No	No	No
Swainsona murrayana	Slender Darling-pea V	No	No	No	No	No	No	No		No	No	No
Thelymitra megcalyptra	Scented sun orchid E1	No	No	No	No	No	No	No		No	No	No
Wilsonia rotundifolia	Round-leafed wilsonia E1	No	No	No	No	No	No	No		No	No	No

Seven Part Tests for Flora

The following information addresses questions relating to the development footprint. Although no threatened flora were found, comments relating to flora and the Seven Part test are provided below. In addition, a summary Seven Part Test table has been prepared (

Table 2) for all listed threatened flora and detailed comments prepared for the one flora species - Slender Darling-pea (*Swainsona murrayana*), that could possibly be (but unlikely) found on the development site.

Slender Darling-pea (*Swainsona murrayana*)

These species cannot be confirmed as being present or absent, so a precautionary approach has been taken and the seven part test applied.

a) *In the case of a threatened species, whether the action proposed is likely to have an adverse effect on the lifecycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.*

There is no viable population nor were there anyindividual plants of Slender Darling-pea found. A search (1/09/2017) of the Atlas of NSW Wildlife found no additional records for this species within 10 km of the proposed development site.

b) *In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the lifecycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction.*

There are no endangered populations of the Slender Darling-pea listed on the schedules of the *Threatened Species Conservation Act 1995*.

c) *In the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:*

- *Is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to placed at risk of extinction, or*
- *Is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction.*

There are no endangered ecological communities or critically endangered ecological communities of the Slender Darling-pea listed on the schedules of the *Threatened Species Conservation Act 1995*.

d) In relation to the habitat of a threatened species, population or ecological community:

- *The extent to which habitat is likely to be removed or modified as a result of the action proposed, and*

Due to past land use activities the rezoning area is not likley to provide suitable habitat for Slender Darling-pea .

- *Whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and*

There is no suitable habitat area under the current land use.

- *The importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality;*

The Slender Darling-pea has been recorded from a few locations within Murray River Council, the closest being 10 km to the north at Barnes Crossing (NPNSW Wildlife Atlas). As there are no records (Atlas of NSW Wildlife, 23/05/2017) of the Slender Darling-pea on the site, or from the surrounding area which has been substantially modified, the proposed development site is not considered to be of importance for potential habitat.

- *Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly);*

There will be no critical habitat affected by the proposal, as there is no critical habitat listed for the Slender Darling-pea on the Register of Critical Habitat.

- *Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan.*

There is no recovery or threat abatement plan for the Slender Darling-pea specifically covering the locality. Furthermore, since no suitable habitat has been identified, there should be no need for action in relation to recovery or threat abatement plans.

- *Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of a key threatening process.*

The proposed development actions do not constitute part of any key threatening process over and above those already occurring including previous land uses.

Threatened Fauna

In assessing habitat for vertebrate fauna species recorded within the Murray River Council, none had habitat requirements that were specific to the site in question although the local area has sites consisting of wetland and woodland. There are vertebrate species recorded that are considered ubiquitous, occupying many locations with similar habitat along the Murray corridor.

A complete fauna list is provided in Appendix 2. A total of 239 animal species have been recorded in Murray River Council 1:100,000 mapsheet (NPNSW Wildlife Atlas 2017). 57 vertebrate species have been recorded in the vicinity including two introduced fauna species (Fox-*Vulpes vulpes* and Brown hare-*Lepus capensis*).

In addition to species recorded on-site during this study (Appendix 2) Lane (2013) recorded the presence of the following native speciesclose to the study site: Brown Treecreeper, Azure Kingfisher, Nankeen night-heron, Masked owl, Varied sittella and the Squirrel glider.

The Squirrel glider *(Petaurus norfolcensis)* is a potential inhabitant of hollow bearing trees located on road reserves and in paddocks and has been located previously 100 m to the south of the study area (NPNSW Wildlife Atlas 2017). The large remnant Black box on the roadside and some of the Red gums outside the development footprint may house the species, but since the species was not observed on the site, its presence or absence could not be confirmed. Since the existing potential habitat trees that are outside the property will be unaffected by the proposed rezoning and potential development there are not expected to be any adverse effects on the species, were they to occur on or close to the site.

Corben's Long-eared bat (*Nyctophilus corbeni*) and Yellow-bellied Sheathtail Bat (*Saccolaimus flaviventris*) were also recorded by Lane (2013). The closest other record of Corben's Long-eared bat is 65 km north near Deniliquin and the closest record of the Yellow-bellied sheathtail bat is from the Milewa Forest some 40 km to the north of the study site. Similarly, the Large-footed myotis (*Myotis adversus*) utilises tree hollows and forages in the open, as well as forested environments. The nearest other records of this species is in the Moira Forest some 30 km to the north of the site. A precautionary management approach will involve preservation of the existing large Red gums and Black box trees for these and other hollow dwelling species. It should be noted that there are a number of trees with habitat hollows close to the property and along the roadside but none identified with suitable hollows withinthe study site.

No threatened birds or reptiles were recorded on or close to the rezoning area during the site assessment. Although the author noted the presence of goannas (*Varanus sp.* - a protected species) in the nearby area and a mob of about fifteen Grey kangaroos (*Macropus giganteus*) that also appear to be resident in the area.

Seven Part Test for Fauna

With a few exceptions (e.g. Squirrel glider) the majority of listed threatened fauna species for the Murray Council area are not regular inhabitants of the site and the lack of hollows means that the site does not provide for many of their specific requirements. The test is therefore of limited applicability to most of the species listed. Table 3 that follows is a summary of the Seven Part Test relating to fauna. Fish species have been excluded because of the distance to the river and no habitat on the site.

Table 3. Summary of Seven Part Test for Fauna

Threatened Species Seven Part Test of Significance (NA-Not Applicable)		*Adverse effect on lifecycle risk of extinction*	*Endangered population, likely to be placed at risk of extinction*	*In the case of an endangered ecological community or critically endangered ecological community, whether the action proposed will:*		*In relation to the habitat of a threatened species, population or ecological community*						*In relation to the habitat of a threatened species, population or ecological community*
				Adversely affect the extent of the ecological community	*Substantially and adversely modify the composition of the ecological community*	*Extent to which habitat is likely to be removed or modified as a result of the action proposed*	*If habitat is to be fragmented or isolated from other areas of habitat as a result of the proposed action*	*Connection to other areas*	*Importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality*	*Any adverse effect on critical habitat*	*If action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan*	*If action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of a key threatening process*
Scientific name	**Common name and presence**											
Botaurus poiciloptilus	Australasian bittern V Seasonal No suitable habitat	No	No	NA	NA	No	No	Yes	No net change to habitat	No	No	No
Burhinus grallarius	Bush stone-curlew E1 Unlikely b/c disturbed habitat, No cover	No	No	NA	NA	No	No	Yes		No	No	No
Cinclosoma castanotus	Chestnut quail-thrush V Possible, but limited suitable habitat	No	No	NA	NA	No	No	Yes		No	No	No
Climacteris picumnus	Brown treecreeper V Possible, poor habitat	No	No	NA	NA	No	No	Yes		No	No	No
Crinia sloanei	Sloane's froglet. V.	No	No	NA	NA	No	No	Yes		No	No	No
Grantiella picta	Painted honeyeater V Possible	No	No	NA	NA	No	No	Yes		No	No	No
Inox connivens	Barking owl V Possible	No	No	NA	NA	No	No	Yes		No	No	No
Lathamus discolor	Swift parrot E1 Possible but unlikely	No	No	NA	NA	No	No	Yes		No	No	No
Melithreptus gularis gularis	Black-chinned honeyeater (eastern subspecies) V Possible but unlikely	No	No	NA	NA	No	No	Yes		No	No	No
Pachycephala inormnota	Gilbert's whistler V Possible	No	No	NA	NA	No	No	Yes		No	No	No
Phascogale tapoatafa	Brush-tailed phascogale V Possible but	No	No	NA	NA	No	No	Yes		No	No	No

	unlikely											
Phascolarctos cinereus)	Koala V Possible	No	No	NA	NA	No	No	Yes	No net change to habitat	No	No	No
Pedionomus torquatus	Plains-wanderer E1 Possible but unlikely	No	No	NA	NA	No	No	Yes		No	No	No
Pyrrholaemus saggitatus	Speckled warbler V NA suitable habitat	No	No	NA	NA	No	No	Yes		No	No	No
Melanodryas cucullata	Hooded robin V Possible	No	No	NA	NA	No	No	Yes		No	No	No
Myotis adversus	Large-footed myotis V Possible (Moira SF 40 km)	No	No	NA	NA	No	No	Yes		No	No	No
Petaurus norfolcensis	Squirrel glider V. Recorded 100m south of study site	No	No	NA	NA	Minimal	No	Yes		Minimal	No	No
Pomatostomus temporalis	Grey-crowned babbler (eastern subspecies) V Possible	No	No	NA	NA	No	No	Yes		No	Yes	No
Polytelis swainsonii	Superb parrot V Possible	No	No	NA	NA	No	No	Yes		No	No	No
Rostratula benghalensis australis	Painted snipe (Australian subspecies) E1 Possible	No	No	NA	NA	No	No	Yes		No	No	No
Saccolaimus flaviventris	Yellow-bellied sheathtail-bat V Possible (Milewa SF 40 km)	No	No	NA	NA	No	No	Yes		No	No	No
Stagonopleura guttata	Diamond firetail V Possible	No	No	NA	NA	No	No	Yes		No	No	No
Stictonetta Noevosa	Freckled duck V Seasonal	No	No	NA	NA	No	No	Yes		No	No	No
Xanthomyza phrygia	Regent honeyeater E1 Possible, but unlikely	No	No	NA	NA	No	No	Yes		No	No	No

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SEPP NA. 44 Koala Habitat Protection

The proposed development is located within Murray River Council as listed on Schedule 1 (Amendment NA. 1) of State Environmental Planning Policy (SEPP) NA. 44 and is therefore considered to be within the kNAwn distribution of the Koala (*Phascolarctos cinereus*) within New South Wales. The proposed development site does NAt support "core Koala habitat" (i.e. "*an area of land with a resident population of Koalas, evidenced by attributes such as breeding females and recent sightings of and historical records of a Koala populatio*n").

On the adjacent river areas there are patches of vegetation where the percentage of River red gums in the overstorey meet the requirements for potential Koala habitat. "Potential Koala habitat" is defined as "areas of native vegetation where the trees of types listed in Schedule 2 of SEPP NA 44 "constitute 15% of the total number of trees in the upper or lower strata of the tree component".

NA sightings of Koala were recorded for the proposed development property or surrounding forested areas. The NPWS Atlas of NSW Wildlife records one sighting ~15 km to the west of Moama. More commonly, sightings occur in the Moira and Milewa State Forest, 30 to 40 km to the NArth of the proposed development.

5. Development Impacts and Mitigation

Threatening processes

The impacts of the proposal will affect the remnant vegetation in different ways, as listed in Table 1. One of the threatening processes listed is clearing of native vegetation (e.g. for residences), leading to loss of habitat. As previously stated, it is recommended that all of the existing Red gum and Black box trees on the southern boundary be protected.

Due to the already environmentally degraded nature of most of the proposed rezoning area it is NAt considered to act as a corridor, migratory route, or provide a drought refuge to flora and fauna. However, nearby floodplain vegetation does perform these functions. The maintenance of the few potentially future hollow bearing trees (i.e. large red gums) will potentially, in the future, provide a resource for those species dependent on hollows.

Vegetation

While NA specific constraints will apply in relation to landscape planting, the establishment of street landscape plantings, using native species, will boost the habitat and feeding opportunities, particularly for native birds, bats and insects.

Infrastructure and urban development

The process of infrastructure and urban development always involves extensive soil disturbance. Since the most important habitat trees are on the southern side of the rezoning and any future development should be able to easily avaoid tree root disturbance and pruning.

RuNAff and habitat

RuNAff will be increased as a result of the introduction of hard surfaces, such as roofs and driveways. This is of particular relevance to the endangered Lower Murray River Aquatic Ecological Community.

In terms of the development, water quality will be enhanced by filtering sediment and other particulates using the available wetlands to the south of the rezoning area. It is expected that much of the ruNAff from house roofs will be largely stored and used within the individual properties. Any excess will be held in wetland-detention storage.

RuNAff and detention storage areas (existing wetland) can create habitat for vulnerable species and naturally filter out sediment prior to ruNAff entering the river system. This requires appropriate construction methods that include topsoiling/rock erosion prevention and revegetation with local species especially ground covers and understory.

Figure 6. Protected drainage into a detention storage - wetland habitat

Table 4. Development impacts and mitigation measures

Location	Impact/Activity	Mitigation
Development site (0.43 ha)	Increased ruNAff from hard surfaces with potential for water quality decline and nutrient accessions through surface and subsurface systems to the Murray River.	i) System design in will be in accord with CMA and NSW Water requirements. ii) Use of Water Sensitive Urban Design (WSUD) principles for ruNAff management. iii) Sediment control on building sites and for the wider rezoning area. Sediment control plan.
	NAise, litter, pollution from human/vehicle activity.	i) Prepare appropriate plans for the site development and management including: ➢ Ensure that the density, design and types of activities that occur will be buffered and act to enhance the habitat and amenity of the local area. ➢ Recreational activities to be of a passive nature.
Roadside areas & vegetation-	Feral animal predation.	i) Murray River Council encourages domestic pets to be contained within the property, except when under supervision.
	NAise and activity of construction equipment causing disturbance of nesting and foraging habits.	i) Minimise earthmoving and disturbance activities and confine machinery operating to daylight hours.
	Firewood collection.	i) Signage in the nearby reserve indicating the importance of protecting the vegetation and the understory environment.

Conclusion

NAne of the Threatened Species listed under the Commonwealth EPBC Act 1999 or the NSW Environment, Planning and Assessment Act 1979 and the Threatened Species Conservation Act 1995 were found on the site, although suitable habitat could occur in nearby protected areas.

The remnant individuals of the Red gum and Black box woodland are recommended to be protected within the property rezoning area and the adjacent floodplain reserve. The area of development affected by the proposal is NAt of significance in terms of habitat change.

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Appendix 1. Legal Status Codes

NSW legal status codes

U = unprotected, V = vulnerable, P = protected, E1 = endangered, Ex = extinct.
1 Sensitivity Class 1 (Sensitive Species Data Policy)
2 Sensitivity Class 2 (Sensitive Species Data Policy)
3 Sensitivity Class 3 (Sensitive Species Data Policy)
CH Critical Habitat (Threatened Species Conservation Act 1995)
E1 Endangered (Threatened Species Conservation Act 1995)
E2 Endangered Population (Threatened Species Conservation Act 1995)
E3 Endangered Ecological Community (Threatened Species Conservation Act 1995)
E4 Presumed Extinct (Threatened Species Conservation Act 1995)
E4A Critically Endangered (Threatened Species Conservation Act 1995)
E4B Critically Endangered Ecological Community (Threatened Species Conservation Act 1995)
FCE Critically Endangered Fish (Fisheries Management Act 1994)
FE Endangered Fish (Fisheries Management Act 1994)
FEC Endangered Ecological Community of Fish (Fisheries Management Act 1994)
FEP Endangered Population of Fish (Fisheries Management Act 1994)
FKTP Key Threatening Process of Fish (Fisheries Management Act 1994)
FP Protected Fish (Fisheries Management Act 1994)
FV Vulnerable Fish (Fisheries Management Act 1994)
FX Extinct Fish (Fisheries Management Act 1994)
KTP Key Threatening Process (Threatened Species Conservation Act 1995)
P Protected (National Parks & Wildlife Act 1974)
V Vulnerable (Threatened Species Conservation Act 1995)
V2 Vulnerable Ecological Community (Threatened Species Conservation Act 1995)

Commonwealth status codes

C Listed on China Australia Migratory Bird Agreement
CD Conservation Dependent (Commonwealth EPBC Act 1999)
CE Critically Endangered (Commonwealth EPBC Act 1999)
E Endangered (Commonwealth EPBC Act 1999)
J Listed on Japan Australia Migratory Bird Agreement
K Listed on Republic of Korea Australia Migratory Bird Agreement
KTP Key Threatening Process (Commonwealth EPBC Act 1999)
V Vulnerable (Commonwealth EPBC Act 1999)
X Extinct (Commonwealth EPBC Act 1999)
XW Extinct in the Wild (Commonwealth EPBC Act 1999)

Appendix 2. Murray River Council (Murray LGA) Flora and Fauna Lists

Highlighted species - Observed or additionally, in the case of fauna, heard on or near the site.

Threatened Flora

Threatened Flora	Common name	Scientific name	NSW status	Comm'wth status
Brassicaceae	Winged Peppercress	Lepidium moNAplocoides	E1,P	E
CheNApodiaceae	Turnip Copperburr	Sclerolaena napiformis	E1,P	E
Convolvulaceae	Round-leafed Wilsonia	Wilsonia rotundifolia	E1,P	
Fabaceae (Faboideae)	Slender Darling-pea	Swainsona murrayana	V,P	V
Poaceae	Floating Swamp Wallaby-grass	Amphibromus fluitans	V,P	V

Flora List

* Exotic (NAn-native) species

Plants	Scientific Name	Common Name	Legal Status	Count	
Adiantaceae					
	Cheilanthes austrotenuifolia	Rock Fern	U	1	
	Cheilanthes sieberi	Rock Fern	U	1	
Alismataceae					
	Alisma lanceolatum*		U	6	
	Damasonium minus	Starfruit	U	5	
Amaranthaceae					
	Alternanthera denticulata	Lesser Joyweed	U	9	
	Alternanthera nana	Hairy Joyweed	U	1	
	Alternanthera sp. A		U	16	
	Amaranthus albus*	Tumbleweed	U	1	
	Ptilotus erubescens		U	1	
	Ptilotus exaltatus var. exaltatus	Tall Mulla Mulla	P13	1	
	Ptilotus semilanatus	Lambs tails		U	1
Anthericaceae					
	Arthropodium minus	Small Vanilla Lily	U	2	
	Dichopogon fimbriatus	NAdding Chocolate Lily		U	1
Apiaceae					
	Daucus glochidiatus	Native Carrot	U	4	
	Daucus glochidiatus f. D	Native Carrot	U	1	
	Eryngium rostratum	Blue Devil		U	2
Apocynaceae					
	Marsdenia liisae	Large-flowered Milk Vine	U	3	
Asparagaceae					

	Asparagus asparagoides*	Bridal Creeper	U		2	
Asphodelaceae						
	Bulbine bulbosa	Bulbine Lily		U	1	
	Bulbine semibarbata	Wild Onion			U	1
Asteraceae						
	ActiNAbole uligiNAsum	Flannel Cudweed		U	1	
	Anthemis cotula*	Stinking Mayweed	U		1	
	Arctotheca calendula*	Capeweed			U	24
	Aster subulatus*	Wild Aster		U	1	
	Brachyscome basaltica var. gracilis	Swamp Daisy		U	4	
	Brachyscome chrysoglossa		U	2		
	Brachyscome lineariloba	Hard-headed Daisy	U	1		
	Calocephalus sonderi	Pale Beauty-heads		U	3	
	Calotis anthemoides	Cut-leaved Burr-daisy			U	1
	Calotis cuneifolia	Purple Burr-Daisy	U	2		
	Calotis erinacea	Tangled Burr-daisy	U	1		
	Calotis hispidula	Bogan Flea		U	1	
	Calotis scabiosifolia	Rough Burr-daisy	U	3		
	Calotis scapigera	Tufted Burr-daisy	U	1		
	Carduus pycNAcephalus*	Slender Thistle	U	5		
	Carduus tenuiflorus*	Winged Slender Thistle			U	14
	Cassinia arcuata	Sifton Bush		U	2	
	Centaurea melitensis*	Maltese Cockspur		U	3	
	Centipeda cunninghamii	Common Sneezeweed		U	14	
	Centipeda minima	Spreading Sneezeweed		U	13	
	Centipeda minima var. minima			U	1	
	Chrysocephalum apiculatum	Common Everlasting		U	5	
	Chrysocephalum semipapposum	Clustered Everlasting			U	2
	Cirsium vulgare*	Spear Thistle	U	15		
	Conyza bonariensis*	Flaxleaf Fleabane		U	1	
	Conyza sumatrensis*	Tall fleabane		U	2	
	Cotula australis	Common Cotula	U	12		
	Cotula bipinnata*	Ferny Cotula	U	10		
	Cotula coroNApifolia*	Water Buttons		U	5	
	Craspedia variabilis	Common Billy-buttons		P13	2	
	Eclipta platyglossa	Yellow Twin-heads	U	1		
	Eriochlamys squamata			U	1	
	Euchiton sphaericus	Star Cudweed		U	2	
	Hyalosperma praecox			U	1	
	Hypochaeris glabra*	Smooth Catsear		U	36	
	Hypochaeris radicata*	Catsear		U	9	
	Isoetopsis graminifolia	Grass Cushion		U	1	
	Lactuca serriola*	Prickly Lettuce	U	12		
	Leiocarpa leptolepis	Pale Plover-daisy		U	1	
	Leiocarpa panaetioides	Wooly Buttons		U	1	
	Leontodon taraxacoides subsp. taraxacoides*	Lesser Hawkbit			U	2
	Leptorhynchos squamatus	Scaly Buttons	U	1		
	Leptorhynchos squamatus subsp. squamatus			U	2	
	Leptorhynchos tetrachaetus	Beauty Buttons	U	1		
	Myriocephalus rhizocephalus	Woolly-heads	U	3		
	Olearia pimeleoides			U	1	
	ONApordum acaulon*	Stemless Thistle		U	2	
	Picris echioides*		U	2		
	Pseudognaphalium luteoalbum	Jersey Cudweed		U	8	
	PycNAsorus globosus	Drumsticks			P13	3
	PycNAsorus thompsonianus		P13	1		
	Rhodanthe corymbiflora	Small White Sunray			U	3
	Rutidosis multiflora			U	2	
	Scorzonera laciniata*			U	1	
	Senecio bathurstianus			U	1	
	Senecio lautus subsp. dissectifolius			U	1	
	Senecio quadridentatus	Cotton Fireweed		U	11	
	Senecio runcinifolius	Tall Groundsel		U	5	
	SoleNAgyne bellioides	Solengyne			U	2
	Sonchus asper subsp. glaucescens*	Prickly Sowthistle		U	10	
	Sonchus oleraceus*	Common Sowthistle		U	37	
	Tragopogon porrifolius*	Salsify		U	2	
	Triptilodiscus pygmaeus	Common Sunray	U	4		
	Vittadinia cuneata	A Fuzzweed	U	4		
	Vittadinia gracilis	Woolly New Holland Daisy	U	7		
	Xanthium spiNAsum*	Bathurst Burr		U	3	
	Xerochrysum bracteatum	Golden Everlasting	U	3		
Azollaceae						
	Azolla filiculoides	Pacific Azolla	U	9		
	Azolla pinnata		U	7		
Boraginaceae						

	Amsinckia calycina*	hairy Fiddleneck		U	1	
	Amsinckia intermedia*	Common Fiddleneck			U	9
	CyNAglossum suaveolens	Sweet Hound's-tongue		U	1	
	Echium plantagineum*	Patterson's Curse		U	20	
	Heliotropium europaeum*	Potato Weed	U	1		
	Myosotis discolor*	Forget-me-NAt	U	1		
Brassicaceae						
	Brassica spp.*	Brassica	U	2		
	Capsella bursa-pastoris*	Shepherd's Purse	U	2		
	Cardamine astoniae	Spreading Bitter-cress		U	2	
	Cardamine moirensis	U	1			
	Lepidium africanum*	Common Peppercress		U	5	
	Lepidium moNAplocoides	Winged Peppercress		E1	1	
	Lepidium pseudohyssopifolium	Peppercress		U	1	
	Rorippa laciniata	U	1			
	Rorippa palustris*	Yellow Cress	U	4		
	Sisymbrium erysimoides*	Smooth Mustard	U	4		
	Sisymbrium irio*	London Rocket	U	3		
	Sisymbrium officinale*	Hedge Mustard	U	1		
Callitrichaceae						
	Callitriche sonderi	U	4			
Campanulaceae						
	Wahlenbergia communis	Tufted Bluebell	U	1		
	Wahlenbergia fluminalis	River Bluebell	U	22		
	Wahlenbergia gracilenta	Annual Bluebell	U	3		
	Wahlenbergia luteola	Bluebell	U	1		
Caryophyllaceae						
	Cerastium glomeratum*	Mouse-ear Chickweed			U	11
	Gypsophila tubulosa	Annual Chalkwort		U	1	
	Petrorhagia velutina*	Velvet Pink			U	13
	Sagina apetala*	Annual Pearlwort	U	1		
	Scleranthus minusculus			U	1	
	Silene gallica var. gallica*	French Catchfly	U	1		
	Silene gallica*	French Catchfly	U	1		
	Spergularia rubra*	Sandspurry		U	7	
	Stellaria angustifolia	Swamp Starwort		U	1	
	Stellaria media*	Common Chickweed		U	2	
	Stellaria spp.*	Prickly Starwort	U	2		
Casuarinaceae						
	Allocasuarina luehmannii	Bulloak	U	10		
	Allocasuarina verticillata	Drooping Sheoak	U	1		
	Casuarina pauper	Black Oak		U	1	
CheNApodiaceae						
	Atriplex leptocarpa	Slender-fruit Saltbush		U	1	
	Atriplex nummularia	Old Man Saltbush		U	1	
	Atriplex semibaccata	Creeping Saltbush		U	4	
	Atriplex spinibractea	Spiny-fruit Saltbush			U	2
	CheNApodium desertorum subsp. microphyllum			U	4	
	CheNApodium desertorum subsp. virosum			U	1	
	CheNApodium multifidum*	Scented Goosefoot	U	1		
	CheNApodium murale*	Nettle-leaf Goosefoot			U	8
	CheNApodium pumilio	Small Crumbweed		U	6	
	Dysphania glomulifera subsp. glomulifera			U	1	
	Einadia hastata	Berry Saltbush	U	2		
	Einadia nutans	Climbing Saltbush	U	6		
	Enchylaena tomentosa	Ruby Saltbush		U	5	
	Halosarcia pergranulata subsp. pergranulata			U	1	
	Maireana aphylla	Cotton Bush	U	2		
	Maireana decalvans	Black Cotton Bush		U	1	
	Maireana enchylaeNAides	Wingless Fissure-weed	U	1		
	Maireana humillima			U	1	
	Maireana microphylla	Small-leaf Bluebush			U	2
	Maireana pentagona	Hairy Bluebush, Fissure-weed			U	3
	Maireana pyramidata	Black Bluebush		U	1	
	Rhagodia spinescens	Thorny saltbush		NAt listed		
	Salsola kali var. kali	Buckbush		U	4	
	Sclerolaena birchii	Galvinized Burr	U	5		
	Sclerolaena convexula	Tall Copperburr		U	1	
	Sclerolaena diacantha	Grey Copperburr		U	1	
	Sclerolaena muricata	Black Rolypoly		U	4	
	Sclerolaena muricata var. semiglabra	Black Rolypoly		U	1	
	Sclerolaena napiformis	Turnip Copperburr		E1	7	
	Sclerolaena stelligera	Star Copperburr		U	1	
Clusiaceae						
	Hypericum spp.*		U	1		
Colchicaceae						

	Wurmbea dioica subsp. dioica	Early Nancy		U	1	
Convolvulaceae						
	Calystegia sepium subsp. roseata			U	1	
	Convolvulus erubescens	Pink Bindweed	U	1		
	Convolvulus wimmerensis		U	1		
	Cressa australis		U	2		
	Wilsonia rotundifolia	Round-leafed Wilsonia			E1	1
Crassulaceae						
	Crassula colorata	Dense Stonecrop	U	3		
	Crassula decumbens var. decumbens	Spreading Stonecrop		U	5	
	Crassula peduncularis	Purple Stonecrop		U	13	
	Crassula sieberiana	Australian Stonecrop		U	12	
Cucurbitaceae						
	Citrullus lanatus var. lanatus*	Wild Melon, Camel Melon,Bitter		U	4	
	Cucumis myriocarpus subsp. leptodermis*	Paddy Melon		U	2	
Cupressaceae						
	Callitris glaucophylla	White Cypress Pine		U	1	
	Callitris gracilis subsp. murrayensis	Murray Pine		U	9	
Cyperaceae						
	Bolboschoenus medianus		U	1		
	Carex appressa	Tall Sedge		U	2	
	Carex bicheNAviana			U	1	
	Carex inversa	KNAb Sedge	U	33		
	Carex spp.			U	2	
	Carex tereticaulis		U	24		
	Cyperus brevifolius*			U	1	
	Cyperus difformis	Dirty Dora		U	1	
	Cyperus eragrostis*	Umbrella Sedge	U	3		
	Cyperus exaltatus		U	3		
	Cyperus victoriensis			U	1	
	Eleocharis acuta		U	38		
	Eleocharis pallens	Pale Spike Sedge	U	3		
	Eleocharis plana	Flat Spike-sedge	U	9		
	Eleocharis pusilla		U	24		
	Fimbristylis aestivalis			U	2	
	Isolepis hookeriana		U	1		
	Isolepis spp.	Club-rush		U	4	
	Isolepis victoriensis		U	1		
Davalliaceae						
	Arthropteris spp.		U	14		
Droseraceae						
	Drosera glanduligera	Pimpernel Sundew		U	1	
	Drosera peltata	A Sundew		U	2	
Elatinaceae						
	Elatine gratioloides	Waterwort		U	14	
Euphorbiaceae						
	Chamaesyce drummondii	Caustic Weed	U	18		
Fabaceae (Faboideae)						
	Cullen tenax	Emu-foot	U	1		
	Dillwynia cinerascens			U	5	
	Eutaxia microphylla			U	1	
	Genista monspessulana*	Montpellier Broom	U	1		
	Glycine clandestina	Twining glycine	U	1		
	Glycyrrhiza acanthocarpa	Native Liquorice	U	1		
	Lathyrus angulatus*	Angular Pea		U	1	
	Lotus corniculatus*	Birds-foot Trefoil	U	1		
	Medicago minima*	Woolly Burr Medic	U	5		
	Medicago polymorpha*	Burr Medic			U	27
	Medicago spp.*	A Medic	U	4		
	Swainsona murrayana	Slender Darling-pea			V	5
	Swainsona procumbens	Broughton Pea		U	3	
	Trifolium angustifolium*	Narrow-leaved Clover			U	5
	Trifolium arvense*	Haresfoot Clover	U	33		
	Trifolium campestre*	Hop Clover	U		38	
	Trifolium cernuum*	Drooping-flowered Clover		U	23	
	Trifolium glomeratum*	Clustered Clover		U	36	
	Trifolium hirtum*	Rose Clover	U	1		
	Trifolium spp.*	A Clover	U	4		
	Trifolium striatum*	KNAtted Clover	U	3		
	Trifolium tomentosum*	Woolly Clover		U	22	
Fabaceae (Mimosoideae)						
	Acacia acinacea	Gold-dust Wattle	U	9		
	Acacia dealbata subsp. dealbata	Silver Wattle		U	3	
	Acacia hakeoides	Hakea Wattle	U	1		
	Acacia implexa	Hickory Wattle	U	2		
	Acacia montana	Mallee Wattle	U	1		

	Acacia oswaldii	Miljee		U	3		
	Acacia pycnantha	Golden Wattle		U	1		
	Acacia rigens	Needle Wattle		U	1		
	Acacia salicina	Cooba	U		3		
	Acacia vestita	Weeping Boree		U	1		
Fumariaceae							
	Fumaria bastardii*	Bastards Fumitory	U	1			
	Fumaria densiflora*	Narrow-leaved Fumitory			U	1	
	Fumaria muralis subsp. muralis*	Wall Fumitory			U	2	
Gentianaceae							
	Centaurium spp.			U	1		
Geraniaceae							
	Erodium cicutarium*	Common Crowfoot			U	2	
	Erodium crinitum	Blue Storksbill, Blue Crowfoot			U	2	
	Erodium moschatum*	Musky Crowfoot			U	1	
	Geranium retrorsum	Cranesbill Geranium				U	1
	Geranium solanderi	Native Geranium			U	1	
	Geranium solanderi var. solanderi				U	1	
	Geranium spp.	A Geranium		U	7		
Goodeniaceae							
	Goodenia gracilis			U	3		
	Goodenia heteromera				U	2	
	Goodenia macbarronii	McBarron's Goodenia				U	2
	Goodenia paniculata				U	1	
	Goodenia pusilliflora				U	1	
	Goodenia spp.			U	2		
Haloragaceae							
	GoNAcarpus spp.	Raspwort		U	1		
	Haloragis glauca f. glauca			U	1		
	Myriophyllum crispatum				U	13	
	Myriophyllum papillosum			U	1		
	Myriophyllum spp.			U	1		
	Myriophyllum verrucosum	Red Water-milfoil		U	6		
Hydrocharitaceae							
	Ottelia spp.				U	2	
Hypoxidaceae							
	Hypoxis glabella var. glabella	Tiny Star		U	1		
Iridaceae							
	Moraea setifolia*	Thread Iris			U	2	
	Romulea flava var. miNAr*			U	1		
Isoetaceae							
	Isoetes spp.			U	3		
Juncaceae							
	Juncus amabilis			U	11		
	Juncus aridicola	Tussock Rush		U	28		
	Juncus articulatus*	A Rush		U	1		
	Juncus flavidus			U	32		
	Juncus holoschoenus				U	3	
	Juncus ingens	Giant Rush			U	7	
	Juncus phaeanthus			U	1		
	Juncus semisolidus			U	1		
	Juncus subglaucus	Rush		U	1		
	Juncus subsecundus	Finger Rush			U	3	
	Juncus usitatus			U	3		
Juncaginaceae							
	Triglochin spp.			U	24		
Lamiaceae							
	Ajuga australis	Austral Bugle		U	2		
	Marrubium spp.*			U	2		
	Marrubium vulgare*	Horehound				U	5
	Mentha pulegium*	Pennyroyal			U	1	
	Teucrium racemosum	Grey Germander			U	1	
Linaceae							
	Linum usitatissimum*	Flax			U	1	
Lobeliaceae							
	Isotoma tridens			U	1		
	Lobelia anceps			U	1		
	Lobelia pratioides			U	1		
	Pratia concolor	Poison Pratia		U	5		
Lomandraceae							
	Lomandra effusa	Scented Mat-rush		U	1		
Loranthaceae							
	Amyema liNAphyllum subsp. orientale			U	1		
	Amyema miquelii	Box Mistletoe		U	3		
	Amyema miraculosum subsp. boormanii				U	1	
	Lysiana exocarpi subsp. exocarpi				U	2	

Lythraceae							
	Lythrum hyssopifolia	Hyssop Loosestrife		U	4		
	Lythrum salicaria	Purple Loosestrife	U	1			
Malvaceae							
	Malva parviflora*	Small-flowered Mallow		U	5		
	Sida corrugata	Corrugated Sida	U	11			
	Sida fibulifera		U	1			
	Sida trichopoda	High Sida		U	1		
Marsileaceae							
	Marsilea drummondii	Common Nardoo		U	8		
Menyanthaceae							
	Nymphoides crenata	Wavy Marshwort			U	2	
Myoporaceae							
	Eremophila deserti	Turkeybush		U	1		
	Eremophila longifolia	Emubush				U	2
	Myoporum montanum	Western Boobialla			U	1	
	Myoporum platycarpum	Sugarwood				U	1
Myrsinaceae							
	Anagallis arvensis*	Scarlet/Blue Pimpernel			U	4	
Myrtaceae							
	Callistemon sieberi	River Bottlebrush		U	1		
	Calytrix tetragona	Fringe Myrtle		U	1		
	Eucalyptus blaxlandii				U	1	
	Eucalyptus camaldulensis	River Red Gum			U	29	
	Eucalyptus largiflorens	Black Box				U	9
	Eucalyptus melliodora	Yellow Box				U	13
	Eucalyptus melliodora var. brachycarpa			U	1		
	Eucalyptus microcarpa	Western Grey box			U	5	
	Leptospermum juniperinum	Prickly Tea-tree		U	1		
	Melaleuca lanceolata				U	2	
Oleaceae							
	Fraxinus angustifolia subsp. angustifolia*	Desert Ash				U	1
Onagraceae							
	Epilobium billardiereanum			U	1		
	Epilobium hirtigerum				U	5	
	Epilobium spp.			U	2		
	Ludwigia peploides subsp. montevidensis	Water Primrose			U	4	
	OeNAthera stricta subsp. stricta*				U	1	
Ophioglossaceae							
	Ophioglossum lusitanicum	Adder's Tongue		U	1		
	Ophioglossum spp.			U	6		
Orchidaceae							
	Caladenia carnea var. carnea			P13	1		
	Pterostylis despectans				E4A	1	
	Thelymitra megcalyptra	Scented Sun Orchid				P13	1
Oxalidaceae							
	Oxalis perennans			U	10		
	Oxalis pes-caprae*	Soursob		U	1		
	Oxalis spp.				U	20	
Pittosporaceae							
	Pittosporum angustifolium	Pittosporum		U	1		
Plantaginaceae							
	Plantago drummondii	Dark Sago-weed			U	1	
	Plantago gaudichaudii	Narrow-leaf Plaintain				U	1
	Plantago turrifera	Small Sago-weed		U	1		
Plumbaginaceae							
	Limonium australe	Native Sea Lavender			U	1	
Poaceae							
	Aira cupaniana*	Silvery Hairgrass		U	5		
	Aira spp.*	A Hairgrass			U	17	
	Amphibromus fluitans	Floating Swamp Wallaby-grass				V	3
	Amphibromus macrorhinus			U	1		
	Amphibromus nervosus	Swamp Wallaby Grass				U	19
	Austrodanthonia caespitosa	Ringed Wallaby Grass		U	9		
	Austrodanthonia duttoniana	Brown-back Wallaby Grass		U	3		
	Austrodanthonia setacea	Small-flowered Wallaby Grass			U	7	
	Austrostipa aristiglumis	Plains Grass			U	1	
	Austrostipa bigeniculata	Yanganbil				U	1
	Austrostipa gibbosa	Speargrass			U	1	
	Austrostipa NAdosa	A Speargrass			U	1	
	Austrostipa scabra	Speargrass			U	1	
	Austrostipa scabra subsp. falcata	Rough Speargrass			U	1	
	Austrostipa scabra subsp. scabra	Rough Speargrass			U	10	
	Avena barbata*	Bearded Oats		U	8		
	Avena fatua*	Wild Oats			U	1	
	Avena spp.*	Oats		U	30		

	Briza miNAr*	Shivery Grass	U	5		
	Bromus alopecuros*			U	15	
	Bromus diandrus*	Great Brome	U	29		
	Bromus hordeaceus subsp. molliformis*	Soft Brome		U	12	
	Bromus hordeaceus*	Soft Brome			U	17
	Bromus madritensis	Madrid Brome		U	4	
	Bromus rubens*	Red Brome		U	24	
	Bromus spp.	A Brome	U	2		
	Bromus tectorum*	Droopong Brome	U	23		
	Chloris truncata	Windmill Grass	U	7		
	CyNAdon dactylon	Common Couch	U	1		
	CyNAdon spp.		U	2		
	CyNAdon transvaalensis*	Florida Grass	U	1		
	Danthonia spp.	Wallaby Grass	U	29		
	Digitaria sanguinalis*	Summer Grass, Crab Grass		U	1	
	Diplachne fusca	Brown Beetle Grass	U	15		
	EchiNAchloa colona	Awnless Barnyard Grass		U	1	
	EchiNAchloa crusgalli*	Barnyard Grass		U	2	
	Ehrharta longiflora*	Annual Veldtgrass		U	2	
	Elymus scaber	Common Wheatgrass		U	13	
	Enteropogon acicularis	Curly Windmill Grass			U	1
	Enteropogon ramosus	Curly Windmill Grass			U	2
	Eragrostis australasica	Canegrass			U	2
	Eragrostis cilianensis*	Stinkgrass			U	3
	Eragrostis leptocarpa	Drooping Lovegrass			U	1
	Eragrostis tef*		U	1		
	Eriochloa australiensis	Australian Cupgrass			U	1
	Eriochloa pseudoacrotricha	Early Spring Grass	U	1		
	Homopholis proluta			U	1	
	Hordeum hystrix*	Mediterranean Barley Grass	U	2		
	Hordeum leporinum*	Barley Grass		U	20	
	Hordeum marinum*	Sea Barley Grass		U	2	
	Lachnagrostis filiformis			U	25	
	Lamarckia aurea*	Goldentop		U	1	
	Lolium loliaceum*	Stiff Ryegrass	U	21		
	Lolium perenne*	Perennial Ryegrass	U	14		
	Lolium rigidum*	Wimmera Ryegrass	U	19		
	Lolium temulentum*	Darnel		U	1	
	Ottochloa spp.		U	2		
	Panicum capillare var. occidentale*			U	1	
	Panicum decompositum var. tenuius			U	1	
	Panicum effusum	Poison or Hairy Panic		U	2	
	Panicum gilvum*		U	1		
	Paspalidium aversum	Bent Summer Grass			U	1
	Paspalidium jubiflorum	Warrego Grass		U	4	
	Phalaris miNAr*	Lesser Canary Grass		U	3	
	Phalaris paradoxa*	Paradoxa Grass	U	13		
	Phragmites australis	Common Reed		U	1	
	Poa fordeana	Sweet Swamp-grass		U	3	
	Poa labillardierei var. labillardierei	Tussock		U	1	
	Poa sieberiana var. hirtella		U	1		
	Pseudoraphis spinescens	Spiny Mudgrass	U	4		
	Rostraria cristata*	Annual Cat's Tail	U	9		
	Sporobolus caroli	Fairy Grass		U	1	
	Stipa spp.			U	6	
	Themeda australis	Kangaroo Grass	U	1		
	Vulpia bromoides*	Squirrel Tail Fesque		U	28	
	Vulpia myuros f. megalura*	Rat's-tail Fescue	U	33		
	Vulpia spp.	Rat's-tail Fescue		U	6	
Polygonaceae						
	Fallopia convolvulus*	Black Bindweed		U	1	
	Muehlenbeckia florulenta	Lignum	U	3		
	Muehlenbeckia horrida			U	1	
	Persicaria decipiens	Slender KNAtweed		U	3	
	Persicaria lapathifolia	Pale KNAtweed		U	2	
	Polygonum arenastrum*	Wireweed		U	1	
	Polygonum aviculare*	Wireweed			U	5
	Polygonum plebeium	Small KNAtweed		U	1	
	Rumex brownii	Swamp Dock	U	32		
	Rumex crispus*	Curled Dock	U	2		
	Rumex dumosus	Wiry Dock		U	11	
	Rumex tenax	Shiny Dock		U	14	
Portulacaceae						
	Calandrinia eremaea	Small Purslane		U	4	
	Calandrinia granulifera			U	1	
	Neopaxia australasica			U	1	

Potamogetonaceae						
	Potamogeton spp.		U	2		
Proteaceae						
	Riveria marginata	Silver Riveria	U	1		
	Grevillea huegelii		U	1		
	Hakea leucoptera	Needlewood	U	1		
	Hakea leucoptera subsp. leucoptera			U	1	
	Hakea tephrosperma	Hooked Needlewood			U	3
Ranunculaceae						
	Myosurus minimus var. australis	Mousetail			U	2
	Ranunculus amphitrichus		U	4		
	Ranunculus inundatus	River Buttercup		U	6	
	Ranunculus pachycarpus		U	1		
	Ranunculus pentandrus			U	5	
	Ranunculus pumilio			U	2	
	Ranunculus sceleratus*	Celery Buttercup		U	1	
	Ranunculus sessiliflorus	Common Buttercup	U	17		
	Ranunculus sessiliflorus var. pilulifer	Common Buttercup		U	1	
Rosaceae						
	Aphanes australiana	Australian Pert		U	4	
	Rubus rosifolius	Rose-leaf Bramble	U	1		
Rubiaceae						
	Asperula conferta	Common Woodruff	U	2		
	Galium murale*	Small Bedstraw	U	1		
Rutaceae						
	Citrus glauca	Desert Lime	U	1		
Santalaceae						
	Exocarpos strictus	Dwarf Cherry	U	7		
	Santalum lanceolatum	NArthern Sandalwood			U	2
Scrophulariaceae						
	Euphrasia collina		U	1		
	Glossostigma elatiNAides		U	1		
	Gratiola pedunculata			U	5	
	Mimulus gracilis	Slender Monkey-flower		U	4	
	Stemodia florulenta	Bluerod		U	2	
	Verbascum spp.		U	1		
	Verbascum virgatum*	Twiggy Mullein, Green Mullein			U	1
	Veronica peregrina*	Wandering Speedwell			U	3
Solanaceae						
	Cestrum parqui*	Green Cestrum	U	1		
	Lycium ferocissimum*	African Boxthorn		U	4	
	Physalis viscosa*	Sticky Ground Cherry		U	3	
	Solanum elaeagnifolium*	Silver-leaved Nightshade	U	1		
	Solanum nigrum*	Black-berry Nightshade		U	3	
Stackhousiaceae						
	Stackhousia spp.		U	2		
Stylidiaceae						
	Stylidium despectum	Dwarf Triggerplant		U	1	
Typhaceae						
	Typha domingensis	Narrow-leaved Cumbungi	U	1		
Urticaceae						
	Parietaria debilis	Native Pellitory	U	1		
	Urtica urens*	Small Nettle	U	3		
Verbenaceae						
	Phyla NAdiflora*	Carpet Weed, Lippia		U	1	
Violaceae						
	Viola betonicifolia	Native Violet	U	1		
Zygophyllaceae						
	Tribulus terrestris*	Cat-head	U	2		

Murray River Council (Murray LGA) Threatened Fauna List

Animalia	Scientific name	Common name and occurance	NSW status	Comm. status
Amphibia **Myobatrachidae**	Crinia sloanei	Sloane's Froglet Possible	V,P	
Hylidae	Litoria raniformis	Southern Bell Frog Possible	E1,P	V
Reptilia **Pygopodidae**	Delma impar	Striped Legless Lizard Possible	V,P	V
Aves **Anseranatidae**	Anseranas semipalmata	Magpie Goose Possible	V,P	
Anatidae	Oxyura australis	Blue-billed Duck Possible	V,P	
	Stictonetta naevosa	Freckled Duck Seasonal	V,P	
Ardeidae	Botaurus poiciloptilus	Australasian Bittern Seasonal	E1,P	E
Accipitridae	Circus assimilis	Spotted HarRiver Council Possible	V,P	
	^^Hamirostra melaNAsterNAn	Black-breasted Buzzard Possible	V,P,3	
	Hieraaetus morphNAides	Little Eagle Possible	V,P	
	^^Lophoictinia isura	Square-tailed Kite Possible	V,P,3	
	^^Pandion cristatus	Eastern Osprey	V,P,3	
Falconidae	^Falco hypoleucos	Grey Falcon Possible	E1,P,2	
	Falco subniger	Black Falcon Possible	V,P	
Gruidae	Grus rubicunda	Brolga Possible	V,P	
Otididae	Ardeotis australis	Australian Bustard Possible	E1,P	
Burhinidae	Burhinus grallarius	Bush Stone-curlew Unlikely b/c disturbed habitat	E1,P	
PedioNAmidae	PedioNAmus torquatus	Plains-wanderer Possible but unlikely	E1,P	V
Rostratulidae	Rostratula australis	Australian Painted Snipe Possible	E1,P	E
Scolopacidae				
	Calidris tenuirostris	Great KNAt Possible	V,P	C,J,K
Cacatuidae	Lophochroa leadbeateri	Major Mitchell's Cockatoo Possible	V,P,2	
Psittacidae	Glossopsitta	Purple-crowned	V,P,3	

	porphyrocephala	Lorikeet		
	^^Lathamus discolor	Swift Parrot	E1,P,3	E
	^^Neophema pulchella	Turquoise Parrot	V,P,3	
	^^Polytelis anthopeplus monarchoides	Regent Parrot (eastern subspecies) Possible	E1,P,3	V
	^^Polytelis swainsonii	Superb Parrot Possible	V,P,3	V
Strigidae	^^NiNAx connivens	Barking Owl Possible	V,P,3	
	^^NiNAx strenua	Powerful Owl Unlikley	V,P,3	
Tytonidae	^^Tyto NAvaehollandiae	Masked Owl Possible	V,P,3	
Climacteridae	Climacteris picumnus victoriae	Brown Treecreeper (eastern subspecies) Possible	V,P	
Acanthizidae	Chthonicola sagittata	Speckled Warbler NA suitable habitat	V,P	
Meliphagidae	Anthochaera phrygia	Regent Honeyeater Unlikely	E4A,P	E
	Certhionyx variegatus	Pied Honeyeater Possible	V,P	
	Epthianura albifrons	White-fronted Chat Possible	V,P	
	Grantiella picta	Painted Honeyeater Possible	V,P	
	Melithreptus gularis gularis	Black-chinned Honeyeater (eastern subspecies) Possible but unlikely	V,P	
Pomatostomidae	Pomatostomus temporalis temporalis	Grey-crowned Babbler (eastern subspecies) Possible	V,P	
Psophodidae	Cinclosoma castaNAtum	Chestnut Quail-thrush Possible but NA suitable habitat	V,P	
Neosittidae	DaphoeNAsitta chrysoptera	Varied Sittella Possible	V,P	
Pachycephalidae	Pachycephala iNArnata	Gilbert's Whistler Possible	V,P	
Petroicidae	MelaNAdryas cucullata cucullata	Hooded Robin (south-eastern form) Possible	V,P	
	Petroica boodang	Scarlet Robin Possible	V,P	
	Petroica phoenicea	Flame Robin Possible	V,P	
Estrildidae	StagoNApleura guttata	Diamond Firetail Possible	V,P	
Mammalia			V,P	

Dasyuridae	Phascogale tapoatafa	Brush-tailed Phascogale Possible		
Phascolarctidae	Phascolarctos cinereus	Koala	V,P	V
Petauridae	Petaurus NArfolcensis	Squirrel Glider Possible	V,P	
Emballonuridae	Saccolaimus flaviventris	Yellow-bellied Sheathtail-bat Possible	V,P	
Vespertilionidae	ChaliNAlobus picatus	Little Pied Bat Possible	V,P	
	Myotis macropus	Southern Myotis	V,P	
	Nyctophilus corbeni	Corben's Long-eared Bat Possible	V,P	V

Murray River Council Fauna List

Highlighted species - Observed or heard on or near the site

* Exotic (NAn-native) species

Search criteria : Public Report of Animals in Murray River Council(part that was Murray LGA) returned a total of 10,460 records of 287 species.

Class	Family	Scientific Name	Exotic	Common Name	NSW status	Comm. status
Amphibia	Myobatrachidae	*Crinia parinsignifera*		Eastern Sign-bearing Froglet	P	
Amphibia	Myobatrachidae	*Crinia signifera*		Common Eastern Froglet	P	
Amphibia	Myobatrachidae	*Crinia sloanei*		Sloane's Froglet	V,P	
Amphibia	Myobatrachidae	*LimNAdynastes dumerilii*		Eastern Banjo Frog	P	
Amphibia	Myobatrachidae	*LimNAdynastes fletcheri*		Long-thumbed Frog	P	
Amphibia	Myobatrachidae	*LimNAdynastes peronii*		Brown-striped Frog	P	
Amphibia	Myobatrachidae	*LimNAdynastes tasmaniensis*		Spotted Grass Frog	P	
Amphibia	Hylidae	*Litoria peronii*		Peron's Tree Frog	P	
Amphibia	Hylidae	*Litoria raniformis*		Southern Bell Frog	E1,P	V
Amphibia	Bufonidae	*Rhinella marina*	*	Cane Toad		
Reptilia	Chelidae	*Chelodina longicollis*		Eastern Snake-necked Turtle	P	
Reptilia	Gekkonidae	*Christinus marmoratus*		Marbled Gecko	P	
Reptilia	Pygopodidae	*Delma impar*		Striped Legless Lizard	V,P	V
Reptilia	Scincidae	*Eulamprus tympanum*		Southern Water-skink	P	
Reptilia	Scincidae	*Morethia boulengeri*		South-eastern Morethia Skink	P	
Reptilia	Agamidae	*Pogona barbata*		Bearded Dragon	P	
Reptilia	Varanidae	*Varanus sp.*		Unidentified Goanna	P	
Reptilia	Varanidae	*Varanus varius*		Lace Monitor	P	
Reptilia	Typhlopidae	*Ramphotyphlops bituberculatus*		Prong-sNAuted Blind Snake	P	

Reptilia	Boidae	*Morelia spilota metcalfei*		Murray/Darling Carpet Python	P
Reptilia	Elapidae	*Pseudechis porphyriacus*		Red-bellied Black Snake	P
Reptilia	Elapidae	*Pseudonaja textilis*		Eastern Brown Snake	P
Aves	Casuariidae	*Dromaius NAvaehollandiae*		Emu	P
Aves	Phasianidae	*Coturnix pectoralis*		Stubble Quail	P
Aves	Phasianidae	*Coturnix ypsilophora*		Brown Quail	P
Aves	Anseranatidae	*Anseranas semipalmata*		Magpie Goose	V,P
Aves	Anatidae	*Anas castanea*		Chestnut Teal	P
Aves	Anatidae	*Anas gracilis*		Grey Teal	P
Aves	Anatidae	*Anas rhynchotis*		Australasian Shoveler	P
Aves	Anatidae	*Anas superciliosa*		Pacific Black Duck	P
Aves	Anatidae	*Aythya australis*		Hardhead	P
Aves	Anatidae	*Biziura lobata*		Musk Duck	P
Aves	Anatidae	*CheNAnetta jubata*		Australian Wood Duck	P
Aves	Anatidae	*Cygnus atratus*		Black Swan	P
Aves	Anatidae	*Malacorhynchus membranaceus*		Pink-eared Duck	P
Aves	Anatidae	*Oxyura australis*		Blue-billed Duck	V,P
Aves	Anatidae	*Stictonetta naevosa*		Freckled Duck	V,P
Aves	Anatidae	*Tadorna tadorNAides*		Australian Shelduck	P
Aves	Podicipedidae	*Podiceps cristatus*		Great Crested Grebe	P
Aves	Podicipedidae	*Poliocephalus poliocephalus*		Hoary-headed Grebe	P
Aves	Podicipedidae	*Tachybaptus NAvaehollandiae*		Australasian Grebe	P
Aves	Columbidae	*Columba livia*	*	Rock Dove	
Aves	Columbidae	*Geopelia striata*		Peaceful Dove	P
Aves	Columbidae	*Ocyphaps lophotes*		Crested Pigeon	P
Aves	Columbidae	*Phaps chalcoptera*		Common Bronzewing	P
Aves	Podargidae	*Podargus strigoides*		Tawny Frogmouth	P
Aves	Aegothelidae	*Aegotheles cristatus*		Australian Owlet-nightjar	P
Aves	Anhingidae	*Anhinga NAvaehollandiae*		Australasian Darter	P
Aves	Phalacrocoracidae	*Microcarbo melaNAleucos*		Little Pied Cormorant	P
Aves	Phalacrocoracidae	*Phalacrocorax carbo*		Great Cormorant	P
Aves	Phalacrocoracidae	*Phalacrocorax sulcirostris*		Little Black Cormorant	P
Aves	Phalacrocoracidae	*Phalacrocorax varius*		Pied Cormorant	P
Aves	Pelecanidae	*Pelecanus conspicillatus*		Australian Pelican	P

Aves	Ardeidae	*Ardea intermedia*	Intermediate Egret	P	
Aves	Ardeidae	*Ardea modesta*	Eastern Great Egret	P	
Aves	Ardeidae	*Ardea pacifica*	White-necked Heron	P	
Aves	Ardeidae	*Botaurus poiciloptilus*	Australasian Bittern	E1,P	E
Aves	Ardeidae	*Egretta garzetta*	Little Egret	P	
Aves	Ardeidae	*Egretta NAvaehollandiae*	White-faced Heron	P	
Aves	Ardeidae	*Ixobrychus dubius*	Australian Little Bittern	P	
Aves	Ardeidae	*Nycticorax caledonicus*	Nankeen Night Heron	P	
Aves	Threskiornithidae	*Platalea flavipes*	Yellow-billed Spoonbill	P	
Aves	Threskiornithidae	*Platalea regia*	Royal Spoonbill	P	
Aves	Threskiornithidae	*Plegadis falcinellus*	Glossy Ibis	P	C
Aves	Threskiornithidae	*Threskiornis molucca*	Australian White Ibis	P	
Aves	Threskiornithidae	*Threskiornis spinicollis*	Straw-necked Ibis	P	
Aves	Accipitridae	*Accipiter cirrocephalus*	Collared Sparrowhawk	P	
Aves	Accipitridae	*Accipiter fasciatus*	Brown Goshawk	P	
Aves	Accipitridae	*Accipiter NAvaehollandiae*	Grey Goshawk	P	
Aves	Accipitridae	*Aquila audax*	Wedge-tailed Eagle	P	
Aves	Accipitridae	*Circus approximans*	Swamp HarRiver Council	P	
Aves	Accipitridae	*Circus assimilis*	Spotted HarRiver Council	V,P	
Aves	Accipitridae	*Elanus axillaris*	Black-shouldered Kite	P	
Aves	Accipitridae	*Haliaeetus leucogaster*	White-bellied Sea-Eagle	P	C
Aves	Accipitridae	*Haliastur sphenurus*	Whistling Kite	P	
Aves	Accipitridae	^^*Hamirostra melaNAsterNAn*	Black-breasted Buzzard	V,P,3	
Aves	Accipitridae	*Hieraaetus morphNAides*	Little Eagle	V,P	
Aves	Accipitridae	^^*Lophoictinia isura*	Square-tailed Kite	V,P,3	
Aves	Accipitridae	*Milvus migrans*	Black Kite	P	
Aves	Accipitridae	^^*Pandion cristatus*	Eastern Osprey	V,P,3	
Aves	Falconidae	*Falco berigora*	Brown Falcon	P	
Aves	Falconidae	*Falco cenchroides*	Nankeen Kestrel	P	
Aves	Falconidae	^*Falco hypoleucos*	Grey Falcon	E1,P,2	
Aves	Falconidae	*Falco longipennis*	Australian Hobby	P	
Aves	Falconidae	*Falco peregrinus*	Peregrine Falcon	P	
Aves	Falconidae	*Falco subniger*	Black Falcon	V,P	
Aves	Gruidae	*Grus rubicunda*	Brolga	V,P	
Aves	Rallidae	*Fulica atra*	Eurasian Coot	P	
Aves	Rallidae	*Gallinula tenebrosa*	Dusky Moorhen	P	
Aves	Rallidae	*Porphyrio*	Purple Swamphen	P	

		porphyrio			
Aves	Rallidae	*Porzana fluminea*	Australian Spotted Crake	P	
Aves	Rallidae	*Tribonyx ventralis*	Black-tailed Native-hen	P	
Aves	Otididae	*Ardeotis australis*	Australian Bustard	E1,P	
Aves	Burhinidae	*Burhinus grallarius*	Bush Stone-curlew	E1,P	
Aves	Recurvirostridae	*Himantopus himantopus*	Black-winged Stilt	P	
Aves	Charadriidae	*Erythrogonys cinctus*	Red-kneed Dotterel	P	
Aves	Charadriidae	*Vanellus miles*	Masked Lapwing	P	
Aves	PedioNAmidae	*PedioNAmus torquatus*	Plains-wanderer	E1,P	V
Aves	Rostratulidae	*Rostratula australis*	Australian Painted Snipe	E1,P	E
Aves	Scolopacidae	*Calidris ferruginea*	Curlew Sandpiper	E1,P	C,J,K
Aves	Scolopacidae	*Calidris tenuirostris*	Great KNAt	V,P	C,J,K
Aves	Scolopacidae	*Limosa limosa*	Black-tailed Godwit	V,P	C,J,K
Aves	Turnicidae	*Turnix pyrrhothorax*	Red-chested Button-quail	P	
Aves	Turnicidae	*Turnix varius*	Painted Button-quail	P	
Aves	Laridae	*Chlidonias hybrida*	Whiskered Tern	P	
Aves	Cacatuidae	*Cacatua galerita*	Sulphur-crested Cockatoo	P	
Aves	Cacatuidae	*Cacatua sanguinea*	Little Corella	P	
Aves	Cacatuidae	*Cacatua tenuirostris*	Long-billed Corella	P	
Aves	Cacatuidae	*Eolophus roseicapillus*	Galah	P	
Aves	Cacatuidae	*Eolophus roseicapillus albiceps*		P	
Aves	Cacatuidae	^*Lophochroa leadbeateri*	Major Mitchell's Cockatoo	V,P,2	
Aves	Cacatuidae	*Nymphicus hollandicus*	Cockatiel	P	
Aves	Psittacidae	*Aprosmictus erythropterus*	Red-winged Parrot	P	
Aves	Psittacidae	*Glossopsitta concinna*	Musk Lorikeet	P	
Aves	Psittacidae	^^*Glossopsitta porphyrocephala*	Purple-crowned Lorikeet	V,P,3	
Aves	Psittacidae	*Glossopsitta pusilla*	Little Lorikeet	V,P	
Aves	Psittacidae	^^*Lathamus discolor*	Swift Parrot	E1,P,3	E
Aves	Psittacidae	*Neophema chrysostoma*	Blue-winged Parrot	P	
Aves	Psittacidae	^^*Neophema pulchella*	Turquoise Parrot	V,P,3	
Aves	Psittacidae	*Parrot Hybrid*	Yellow Rosella/Turquoise Parrot	P	
Aves	Psittacidae	*Platycercus elegans flaveolus*	[Yellow Rosella]	P	

Aves	Psittacidae	*Platycercus eximius*	Eastern Rosella	P	
Aves	Psittacidae	^^*Polytelis anthopeplus monarchoides*	Regent Parrot (eastern subspecies)	E1,P,3	V
Aves	Psittacidae	^^*Polytelis swainsonii*	Superb Parrot	V,P,3	V
Aves	Psittacidae	*Psephotus haematoNAtus*	Red-rumped Parrot	P	
Aves	Cuculidae	*Cacomantis flabelliformis*	Fan-tailed Cuckoo	P	
Aves	Cuculidae	*Cacomantis pallidus*	Pallid Cuckoo	P	
Aves	Cuculidae	*Chalcites basalis*	Horsfield's Bronze-Cuckoo	P	
Aves	Cuculidae	*Chalcites lucidus*	Shining Bronze-Cuckoo	P	
Aves	Strigidae	^^*NiNAx connivens*	Barking Owl	V,P,3	
Aves	Strigidae	*NiNAx NAvaeseelandiae*	Southern Boobook	P	
Aves	Strigidae	^^*NiNAx strenua*	Powerful Owl	V,P,3	
Aves	Tytonidae	*Tyto javanica*	Eastern Barn Owl	P	
Aves	Tytonidae	^^*Tyto NAvaehollandiae*	Masked Owl	V,P,3	
Aves	Alcedinidae	*Ceyx azureus*	Azure Kingfisher	P	
Aves	Alcedinidae	*Dacelo NAvaeguineae*	Laughing Kookaburra	P	
Aves	Alcedinidae	*Todiramphus sanctus*	Sacred Kingfisher	P	
Aves	Meropidae	*Merops ornatus*	Rainbow Bee-eater	P	J
Aves	Coraciidae	*Eurystomus orientalis*	Dollarbird	P	
Aves	Climacteridae	*Climacteris affinis*	White-browed Treecreeper	P	
Aves	Climacteridae	*Climacteris picumnus picumnus*		P	
Aves	Climacteridae	*Climacteris picumnus victoriae*	Brown Treecreeper (eastern subspecies)	V,P	
Aves	Climacteridae	*Cormobates leucophaea*	White-throated Treecreeper	P	
Aves	Maluridae	*Malurus cyaneus*	Superb Fairy-wren	P	
Aves	Maluridae	*Malurus lamberti*	Variegated Fairy-wren	P	
Aves	Maluridae	*Malurus sp.*	Unidentified Fairy-wren	P	
Aves	Acanthizidae	*Acanthiza apicalis*	Inland Thornbill	P	
Aves	Acanthizidae	*Acanthiza chrysorrhoa*	Yellow-rumped Thornbill	P	
Aves	Acanthizidae	*Acanthiza chrysorrhoa leighi*		P	
Aves	Acanthizidae	*Acanthiza lineata*	Striated Thornbill	P	
Aves	Acanthizidae	*Acanthiza nana*	Yellow Thornbill	P	
Aves	Acanthizidae	*Acanthiza pusilla*	Brown Thornbill	P	
Aves	Acanthizidae	*Acanthiza reguloides*	Buff-rumped Thornbill	P	
Aves	Acanthizidae	*Acanthiza uropygialis*	Chestnut-rumped Thornbill	P	

Aves	Acanthizidae	*Aphelocephala leucopsis*	Southern Whiteface	P	
Aves	Acanthizidae	*Chthonicola sagittata*	Speckled Warbler	V,P	
Aves	Acanthizidae	*Gerygone fusca*	Western Gerygone	P	
Aves	Acanthizidae	*Sericornis frontalis*	White-browed Scrubwren	P	
Aves	Acanthizidae	*Smicrornis brevirostris*	Weebill	P	
Aves	Pardalotidae	*Pardalotus punctatus*	Spotted Pardalote	P	
Aves	Pardalotidae	*Pardalotus striatus*	Striated Pardalote	P	
Aves	Meliphagidae	*Acanthorhynchus tenuirostris*	Eastern Spinebill	P	
Aves	Meliphagidae	*Anthochaera carunculata*	Red Wattlebird	P	
Aves	Meliphagidae	*Anthochaera phrygia*	Regent Honeyeater	E4A,P	E
Aves	Meliphagidae	*Certhionyx variegatus*	Pied Honeyeater	V,P	
Aves	Meliphagidae	*Entomyzon cyaNAtis*	Blue-faced Honeyeater	P	
Aves	Meliphagidae	*Epthianura albifrons*	White-fronted Chat	V,P	
Aves	Meliphagidae	*Epthianura tricolor*	Crimson Chat	P	
Aves	Meliphagidae	*Grantiella picta*	Painted Honeyeater	V,P	
Aves	Meliphagidae	*LicheNAstomus chrysops*	Yellow-faced Honeyeater	P	
Aves	Meliphagidae	*LicheNAstomus fuscus*	Fuscous Honeyeater	P	
Aves	Meliphagidae	*LicheNAstomus penicillatus*	White-plumed Honeyeater	P	
Aves	Meliphagidae	*LicheNAstomus penicillatus penicillatus*		P	
Aves	Meliphagidae	*LicheNAstomus virescens*	Singing Honeyeater	P	
Aves	Meliphagidae	*MaNArina melaNAcephala*	NAisy Miner	P	
Aves	Meliphagidae	*Melithreptus albogularis*	White-throated Honeyeater	P	
Aves	Meliphagidae	*Melithreptus brevirostris*	Brown-headed Honeyeater	P	
Aves	Meliphagidae	*Melithreptus gularis gularis*	Black-chinned Honeyeater (eastern subspecies)	V,P	
Aves	Meliphagidae	*Melithreptus lunatus*	White-naped Honeyeater	P	
Aves	Meliphagidae	*Philemon citreogularis*	Little Friarbird	P	
Aves	Meliphagidae	*Philemon corniculatus*	NAisy Friarbird	P	
Aves	Meliphagidae	*Purnella albifrons*	White-fronted Honeyeater	P	
Aves	Meliphagidae	*Sugomel niger*	Black Honeyeater	P	
Aves	Pomatostomidae	*Pomatostomus superciliosus*	White-browed Babbler	P	

Aves	Pomatostomidae	*Pomatostomus temporalis temporalis*	Grey-crowned Babbler (eastern subspecies)	V,P
Aves	Psophodidae	*Cinclosoma castaNAtum*	Chestnut Quail-thrush	V,P
Aves	Neosittidae	*DaphoeNAsitta chrysoptera*	Varied Sittella	V,P
Aves	Campephagidae	*Coracina NAvaehollandiae*	Black-faced Cuckoo-shrike	P
Aves	Campephagidae	*Coracina papuensis*	White-bellied Cuckoo-shrike	P
Aves	Campephagidae	*Lalage sueurii*	White-winged Triller	P
Aves	Pachycephalidae	*Colluricincla harmonica*	Grey Shrike-thrush	P
Aves	Pachycephalidae	*Falcunculus frontatus frontatus*	Eastern Shrike-tit	P
Aves	Pachycephalidae	*Pachycephala iNArnata*	Gilbert's Whistler	V,P
Aves	Pachycephalidae	*Pachycephala pectoralis*	Golden Whistler	P
Aves	Pachycephalidae	*Pachycephala rufiventris*	Rufous Whistler	P
Aves	Oriolidae	*Oriolus sagittatus*	Olive-backed Oriole	P
Aves	Artamidae	*Artamus cinereus*	Black-faced Woodswallow	P
Aves	Artamidae	*Artamus cyaNApterus*	Dusky Woodswallow	P
Aves	Artamidae	*Artamus leucorynchus*	White-breasted Woodswallow	P
Aves	Artamidae	*Artamus personatus*	Masked Woodswallow	P
Aves	Artamidae	*Artamus superciliosus*	White-browed Woodswallow	P
Aves	Artamidae	*Cracticus nigrogularis*	Pied Butcherbird	P
Aves	Artamidae	*Cracticus nigrogularis nigrogularis*		P
Aves	Artamidae	*Cracticus tibicen*	Australian Magpie	P
Aves	Artamidae	*Cracticus torquatus*	Grey Butcherbird	P
Aves	Artamidae	*Strepera graculina*	Pied Currawong	P
Aves	Rhipiduridae	*Rhipidura albiscapa*	Grey Fantail	P
Aves	Rhipiduridae	*Rhipidura leucophrys*	Willie Wagtail	P
Aves	Corvidae	*Corvus coroNAides*	Australian Raven	P
Aves	Corvidae	*Corvus mellori*	Little Raven	P
Aves	Monarchidae	*Grallina cyaNAleuca*	Magpie-lark	P
Aves	Monarchidae	*Myiagra cyaNAleuca*	Satin Flycatcher	P
Aves	Monarchidae	*Myiagra inquieta*	Restless Flycatcher	P
Aves	Monarchidae	*Myiagra rubecula*	Leaden Flycatcher	P
Aves	Corcoracidae	*Corcorax melaNArhamphos*	White-winged Chough	P

Aves	Petroicidae	*Eopsaltria australis*		Eastern Yellow Robin	P	
Aves	Petroicidae	*MelaNAdryas cucullata cucullata*		Hooded Robin (south-eastern form)	V,P	
Aves	Petroicidae	*Microeca fascinans*		Jacky Winter	P	
Aves	Petroicidae	*Petroica boodang*		Scarlet Robin	V,P	
Aves	Petroicidae	*Petroica goodeNAvii*		Red-capped Robin	P	
Aves	Petroicidae	*Petroica phoenicea*		Flame Robin	V,P	
Aves	Cisticolidae	*Cisticola exilis*		Golden-headed Cisticola	P	
Aves	Acrocephalidae	*Acrocephalus australis*		Australian Reed-Warbler	P	
Aves	Acrocephalidae	*Acrocephalus australis australis*			P	
Aves	Megaluridae	*Cincloramphus cruralis*		Brown Songlark	P	
Aves	Megaluridae	*Cincloramphus mathewsi*		Rufous Songlark	P	
Aves	Megaluridae	*Megalurus gramineus*		Little Grassbird	P	
Aves	Timaliidae	*Zosterops lateralis*		Silvereye	P	
Aves	Hirundinidae	*Cheramoeca leucosterna*		White-backed Swallow	P	
Aves	Hirundinidae	*Hirundo neoxena*		Welcome Swallow	P	
Aves	Hirundinidae	*Petrochelidon ariel*		Fairy Martin	P	
Aves	Hirundinidae	*Petrochelidon nigricans*		Tree Martin	P	
Aves	Turdidae	*Turdus merula*	*	Eurasian Blackbird		
Aves	Sturnidae	*Sturnus vulgaris*	*	Common Starling		
Aves	Sturnidae	*Acridotheres tristis*		Indian myna		
Aves	Nectariniidae	*Dicaeum hirundinaceum*		Mistletoebird	P	
Aves	Estrildidae	*Neochmia temporalis*		Red-browed Finch	P	
Aves	Estrildidae	*Neochmia temporalis temporalis*			P	
Aves	Estrildidae	*StagoNApleura guttata*		Diamond Firetail	V,P	
Aves	Estrildidae	*Taeniopygia guttata*		Zebra Finch	P	
Aves	Passeridae	*Passer domesticus*	*	House Sparrow		
Aves	Motacillidae	*Anthus NAvaeseelandiae*		Australian Pipit	P	
Aves	Fringillidae	*Carduelis carduelis*	*	European Goldfinch		
Mammalia	Ornithorhynchidae	*Ornithorhynchus anatinus*		Platypus	P	
Mammalia	Tachyglossidae	*Tachyglossus aculeatus*		Short-beaked Echidna	P	
Mammalia	Dasyuridae	*Antechinus flavipes*		Yellow-footed Antechinus	P	
Mammalia	Dasyuridae	*Phascogale tapoatafa*		Brush-tailed Phascogale	V,P	
Mammalia	Phascolarctidae	*Phascolarctos cinereus*		Koala	V,P	V

Mammalia	Petauridae	*Petaurus breviceps*		Sugar Glider	P	
Mammalia	Petauridae	*Petaurus NArfolcensis*		Squirrel Glider	V,P	
Mammalia	Pseudocheiridae	*Pseudocheirus peregrinus*		Common Ringtail Possum	P	
Mammalia	Acrobatidae	*Acrobates pygmaeus*		Feathertail Glider	P	
Mammalia	Phalangeridae	*Trichosurus sp.*		Brushtail possum	P	
Mammalia	Phalangeridae	*Trichosurus vulpecula*		Common Brushtail Possum	P	
Mammalia	Macropodidae	*Macropus giganteus*		Eastern Grey Kangaroo	P	
Mammalia	Macropodidae	*Wallabia bicolor*		Swamp Wallaby	P	
Mammalia	Emballonuridae	*Saccolaimus flaviventris*		Yellow-bellied Sheathtail-bat	V,P	
Mammalia	Molossidae	*Mormopterus "Species 2"*		Undescribed Freetail Bat	P	
Mammalia	Molossidae	*Mormopterus "Species 4" (big penis)*			P	
Mammalia	Molossidae	*Mormopterus planiceps*		Little Mastiff-bat	P	
Mammalia	Molossidae	*Mormopterus sp.*		mastiff-bat	P	
Mammalia	Molossidae	*Tadarida australis*		White-striped Freetail-bat	P	
Mammalia	Vespertilionidae	*ChaliNAlobus gouldii*		Gould's Wattled Bat	P	
Mammalia	Vespertilionidae	*ChaliNAlobus morio*		Chocolate Wattled Bat	P	
Mammalia	Vespertilionidae	*ChaliNAlobus picatus*		Little Pied Bat	V,P	
Mammalia	Vespertilionidae	*Myotis macropus*		Southern Myotis	V,P	
Mammalia	Vespertilionidae	*Nyctophilus corbeni*		Corben's Long-eared Bat	V,P	V
Mammalia	Vespertilionidae	*Nyctophilus geoffroyi*		Lesser Long-eared Bat	P	
Mammalia	Vespertilionidae	*Nyctophilus gouldi*		Gould's Long-eared Bat	P	
Mammalia	Vespertilionidae	*Nyctophilus sp.*		long-eared bat	P	
Mammalia	Vespertilionidae	*Scotorepens balstoni*		Inland Broad-NAsed Bat	P	
Mammalia	Vespertilionidae	*Vespadelus darlingtoni*		Large Forest Bat	P	
Mammalia	Vespertilionidae	*Vespadelus regulus*		Southern Forest Bat	P	
Mammalia	Vespertilionidae	*Vespadelus vulturnus*		Little Forest Bat	P	
Mammalia	Muridae	*Hydromys chrysogaster*		Water-rat	P	
Mammalia	Muridae	*Mus musculus*	*	House Mouse		
Mammalia	Muridae	*Rattus rattus*	*	Black Rat		
Mammalia	Canidae	*Canis lupus*	*	Dingo, domestic dog		
Mammalia	Canidae	*Vulpes vulpes*	*	Fox		
Mammalia	Felidae	*Felis catus*	*	Cat		
Mammalia	Leporidae	*Lepus capensis*	*	Brown Hare		
Mammalia	Leporidae	*Oryctolagus cuniculus*	*	Rabbit		
Mammalia	Leporidae	*Rabbit sp.*	*	Brown Hare\Rabbit	P	

Mammalia	Suidae	*Sus scrofa*	*	Pig
Mammalia	Bovidae	*Bos taurus*	*	European cattle
Mammalia	Bovidae	*Capra hircus*	*	Goat
Mammalia	Bovidae	*Ovis aries*	*	Sheep (feral)
Mammalia	Cervidae	*Cervus sp.*	*	Unidentified Deer

Appendix 3. Selected Flora Illustrations

Winged Peppercress (*Lepidium moNAplocoides) E1 (Deniliquin)*

Turnip Copperburr *(Sclerolaena napiformis) E1 Endangered (Cobb H'way - Barnes crossing)*

Round-leafed Wilsonia (*Wilsonia rotundifolia) E1 -Endangered (Bunaloo)*

Slender Darling-pea (*Swainsona murrayana*) Vulnerable (Barnes Crossing)

Lowly greenhood (Pterostylis despectans) E4A 1 (Barnes Crossing)

*W*estern Water-Starwort *(Callitriche cyclocarpa)* V

Scented sun orchid (E1) (*Thelymitra megcalyptra*)

Floating Swamp Wallaby-grass (*Amphibromus fluitans*)V 3 (1 km SE of site at river) Photo Geoff Carr

Appendix 4. Group and Individual Tree Assessments

Private property - The table (A4-Table1) below and Figure A4-1 lists the attributes of trees >10 cm DBH within the property boundary (30 m from front fence).

Table A4- Trees more than 10 cm DBH on the property

Tree NA	*Species (Number)*	*Height (m)*	*Diam DBH (cm)*	*Foliage Cover (%)*	*CaNApy Diam (m)*	*Logs hollows or nests*	*Ground cover*
Trees 1 and 2 outside Lot 26 Boundary	-	-	-	-	-	-	-
Tree 3	Black box *(Eucalyptus largiflorens)*	7-8	15-75	55	8	-	Introduced grasses
Tree 4	*Red gum (E.camaldulensis)*	9	75	45	7	-	Introduced grasses
Tree 5	*Red gum (E.camaldulensis)*	10	50	50	6	-	Introduced grasses
Tree 6	*Red gum (E.camaldulensis)*	10	40	50	6	-	Introduced grasses
Tree 7	*Red gum (E.camaldulensis)*	12	75			-	Bare
Tree 8	*Red gum (E.camaldulensis)*	14	60			-	Bare
Tree 9 (Pollarded)	*Red gum (E.camaldulensis)*	3	70	5	1.5	-	Bare
Tree 10	*Red gum (E.camaldulensis)*	10	42	50	8	-	Introduced grasses
Tree 11	*Black box (Eucalyptus largiflorens)*	7	30	35	7	-	Introduced grasses
Tree 12	*Red gum (E.camaldulensis)*	7	15	30	4	-	Introduced grasses
Groups 1 and 2 outside Lot 26 boundary	-	-	-	-	-	-	-
Group 3	*Red gum (E.camaldulensis) (1)*	7	30	60	7	-	Introduced grasses
	Black box *(Eucalyptus largiflorens)* (6)	6-7	25,80	55	6	-	Introduced grasses
	Black box *(Eucalyptus largiflorens)* (12)	7-8	15-75	55	8	-	Introduced grasses
Group 4	*Red gum (E.camaldulensis) (4)*	12-14	75-110	50	11	-	Introduced grasses
	Red gum (E.camaldulensis) (2)	8-10	15, 20	50	7-8	-	Introduced grasses
	Grey box (E. microcarpa) (1)	*90*	*22*	*60*	*5*	-	Introduced grasses

Figure A4-1. Vegetation mapping (trees NAt marked are NAn-indigeNAus species). Only the trees on Lot 26 are relevant to the rezoning

Figure A4-2. View west to Lot 26. Introduced species - Ironbark and Peppercorns

Figure A4-3. View south Group 3

Figure A4-4. View south-west Group 4

Attachment H

Due Diligence Assessment Aboriginal & European Cultural Heritage

Due Diligence Assessment Aboriginal and European Cultural Heritage for a Rezoning Application Part of Lot 26, Boundary Road Moama NSW 2731 (B. Donchi)

ADVANCED ENVIRONMENTAL SYSTEMS
CREATING A SUSTAINABLE FUTURE

Phone: (03) 5482 5882 or 0412 151 225 Email: aes@echuca.net.au

Client Details	
Address of site	Boundary Road, Moama 2731 Lot 26 DP751152
Name of site manager	Barry Donchi
Phone number	(03) 5480 0044
Email address	admin@nullarbortimber.com.au

Assessor Details	
Name of investigating company	Advanced Environmental Systems P/L (AES)
Nominated individual/s	Mr Peter Clinnick (B. Ag. Sci. Hons. M. ASSSI) Ms Inge Clinnick (B. Arts – Archaeology undergraduate) La Trobe University.
Date of application commencement	12th August 2017
Phone number	(03) 5482 5882 Mob: 0412 151 225
Email address	pc@environmentalsystems.com.au

Authors' Expertise

Mr Peter Clinnick has a Degree in Agricultural Science with Honours from La Trobe University and is a recognized soil scientist and Member of the Soil Science Society of Australia since 1980. Peter has over 15 years' experience in cultural heritage management and routinely undertakes cultural heritage assessments including Due Diligence Assessments and Cultural Heritage Management Plans (CHMPs) for rural landholders, developers and utilities. Peter is currently Managing Director of the regionally based environmental consulting company Advanced Environmental Systems Pty Ltd.

Ms Inge Clinnick is a La Trobe University Undergraduate. Through her course in archaeology and related fieldwork she has developed a strong understanding of the Aboriginal interactions with the environment the local region and its Aboriginal heritage.

Disclaimer

This report has been prepared based on the information available to AES – Advanced Environmental Systems at the time and represents to the best of AES's knowledge and the client's intentions at the time of printing of the document. The assessment of potential issues and impacts and conclusions drawn reflect our best judgment, based on that information. Although all possible care is taken, AES – Advanced Environmental Systems Pty Ltd, together with its employees accepts no responsibility for any resultant errors contained herein and any damage or loss, howsoever caused, and suffered by any individual or corporation.

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Notes

Executive Summary

This report has been provided as support for a Development Application to Murray River Council for rezoning of the subject land from Environmental Management (E3) to Residential (R2) that is likely to be developed for limited residential purposes.

The study has been conducted following concerns raised by the Office of Environment and Heritage regarding the potential of the site, to contain items of Aboriginal Cultural Heritage. The report addresses these matters relating to Aboriginal as well as European Cultural Heritage and provides an information base that will enable planners and stakeholders to understand the local heritage context and assess any impacts of the proposed activity on potential Aboriginal and European heritage values.

The archaeological assessment of the proposed development area bordering Boundary Road (Part of Lot 26 DP751152, Figures 1 and 2), Moama (~0.43) was undertaken on 12th August 2017. The key objectives of the archaeological assessment were to:

1. Locate and record any Aboriginal and European archaeological and cultural heritage sites in the area proposed for development and surrounding lands;
2. Find measures to mitigate any possible damage to potential archaeological finds or cultural heritage sites;
3. Consult representatives of the local Aboriginal community to ascertain their concerns in relation to any site heritage issues relating to any proposed works.

The report was prepared following field investigations and Aboriginal Heritage Information Management System (AHIMS) database research, as well as relevant archaeological and environmental information. Aerial imagery and topographic maps relating to the site and surrounding area were also used.

Fieldwork was undertaken by cultural heritage investigator Peter Clinnick from AES, with a representative of the Moama Local Aboriginal Land Council - Mr Phillip Hudson.

The key findings are:

1. The field assessment of the site revealed no Aboriginal artefacts or other items of cultural importance were observed on the subject land (Lot 26 DP751152);
2. That the archaeological potential of the " rezoning area" is low, because of previous ground disturbance; and
3. The Aboriginal representatives have no objections (Refer MLALC letter – Appendix 2) to the proposed works proceeding provided existing scarred tree on the road reserve is protected for harm.
4. Accordingly, there is a requirement for a 5m protection buffer around the tree on the road reserve. There are no specific management strategies required for the " rezoning area" and no impediment to any proposed works proceeding.

There will be no impact whatsoever relating to Aboriginal or European cultural heritage providing the roadside scar tree is protected.

Notes

Aboriginal and European Cultural Heritage Assessment

(Part of Lot 26) Boundary Road, Moama NSW

Introduction

This report has been prepared and is submitted as part of the Murray River Council's Approval process for rezoning of part of Lot 26 Boundary Road, Moama from Environmental Management (E3) to Residential (R2). The study has been conducted following concerns raised by the Office of Environment and Heritage regarding the potential of the site, close to the Murray River, to contain items of Aboriginal Cultural Heritage. The report addresses these matters relating to Aboriginal as well as European Cultural Heritage and provides an information base that will enable planners and stakeholders to understand the local heritage context and assess any impacts of the proposed activity on potential Aboriginal and European heritage values.

In addition, the report provides information and recommendations to address relevant issues at the site of the proposed works. The report has also been prepared in order to satisfy the requirements of the NSW State National Parks and Wildlife Act 1974, National Parks and Wildlife Amendment Act 2001 and Environmental Planning and Assessment Act 1979 and the Commonwealth Aboriginal and Torres Strait Islander Heritage Protection Act 1984.

The Aboriginal and European Cultural Heritage Due Diligence Assessment of the proposed works bordering Boundary Road (Lot 26, DP751152), Moama (~ 0.43) was undertaken on 12th August 2017.

The report was prepared following field investigations and Aboriginal Heritage Information Management System (AHIMS) database research relating to the site.

The key objectives of the archaeological survey were to:

1. Locate and record any Aboriginal and European archaeological and cultural heritage sites in the area proposed for development and surrounding lands;
2. Find measures to mitigate any possible damage to potential archaeological finds or cultural heritage sites;
3. Consult representatives of the local Aboriginal community to ascertain their concerns about site heritage issues relating to the proposed development.

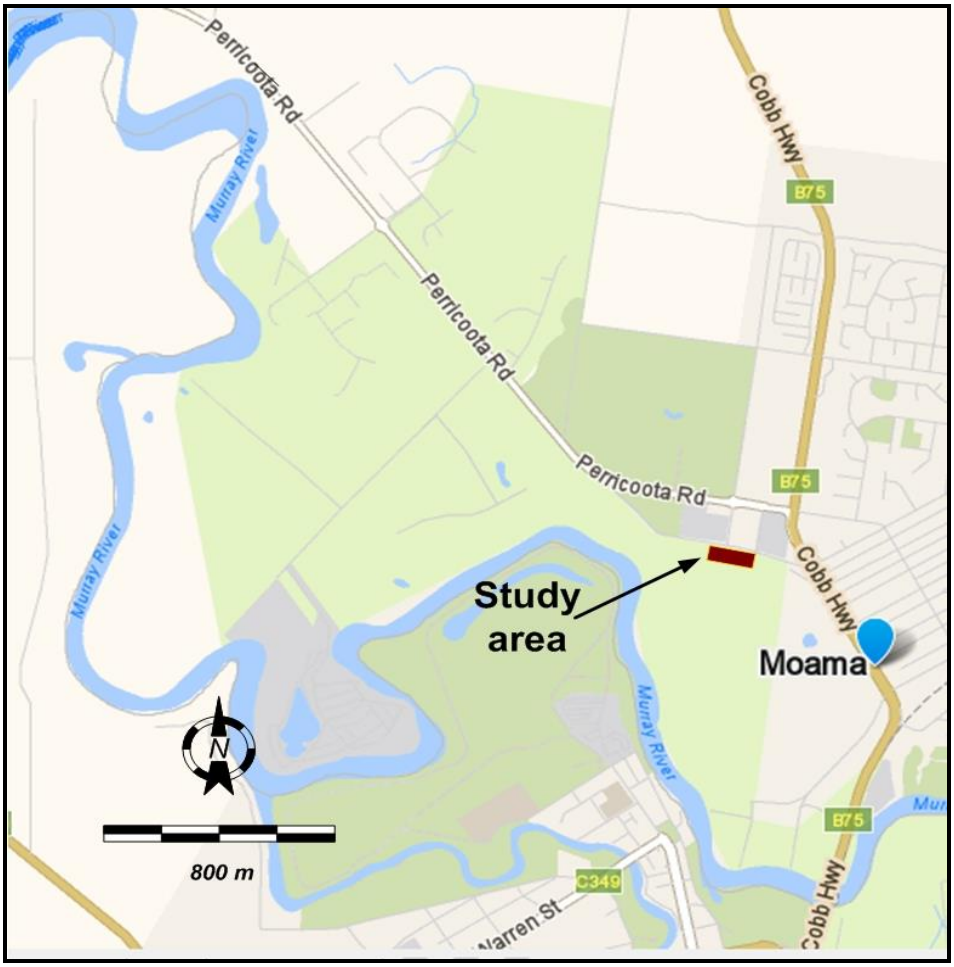

Figure 1. Locality plan and site location

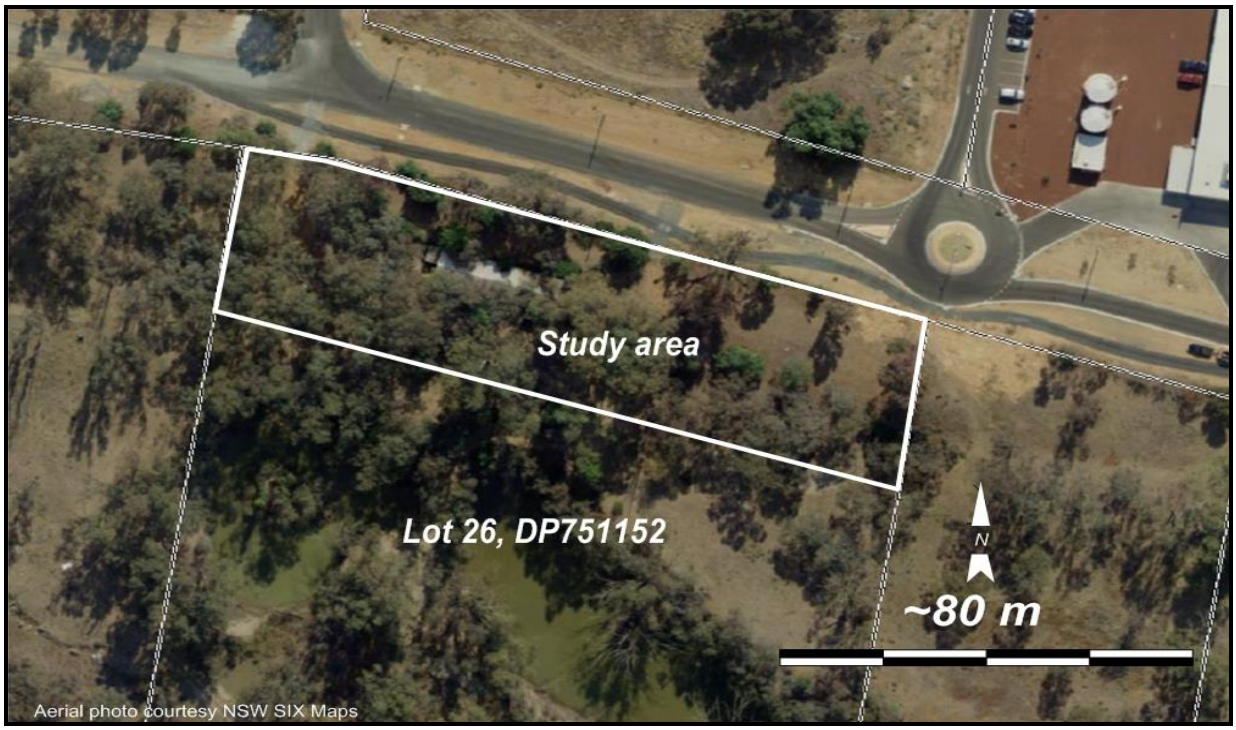

Figure 2. Lot 26 Boundary Road, Moama rezoning study area

1. Natural Features, Land Use and Planning

1.1 Topography, Geomorphology and Land Use

The site topography of the proposed development area is gently sloping (2-3%) with a southerly aspect and a steeper river terrace bank close to the southern boundary of the proposed rezoning area.

The ancestral Murray River originally followed a path along Green gully near Mathoura. Uplift of the Cadell Fault redirected the river down what is now the Edwards River (Harris 1939; Bowler 1978). In more recent geological time the river has taken a course that dissects the floor of a palaeolake (old Lake Kanyapella) and has then followed the ancestral Goulburn River. Stone (2006) conducted a study of the Moira Lakes and Murray River – Barmah Choke and concluded that the river in the Echuca – Moama area was only ~550 years old. Moreover, the steep gradient of the river has all but precluded the deposition of sediments in the area of recent avulsion.

The land (Part of Lot 26) is located on the north side of the Murray River on Boundary Road. Lot 26 and the adjacent areas have been previously predominantly used for grazing, sawmilling and recreation. There is a residence located on the western portion of Lot 26.

Figure 3. Boundary Road Lot 26 upper river terrace (view east)

Figure 4. Boundary Road Lot 26 upper river terrace (view west)

1.2 Zoning

The site under consideration is covered by the planning zone Environmental Management (E3).

1.3 Murray River Council Development Control Plan

The key objectives of the Murray Shire's Development Control Plan (DCP) in relation to residential development area are:

- To provide for a variety of residential development that caters for the housing needs of local residents;
- Encourage dwelling design that has minimal impact on adjoining neighbours;
- Ensure that residential buildings offer visual interest in their appearance and style;
- Make sure that new development is sympathetic with the established form of an area to ensure that neighbourhoods with distinct character are developed over time.
- Ensure that new residential development is consistent with the desired future form and density of an area.
- Encourage residential development that is respectful of the character of areas which are developed over time.

The rezoning and development of the land and meeting of the key objectives of the DCP will not compromise Aboriginal or European historical cultural heritage values in any way.

1.4 Murray Regional Environmental Plan No 2 - Riverine Land

The Environmental Planning and Assessment Act 1979; Regulation 8 of the Murray Regional Environmental Plan (MREP) No 2 applies when:

(a) Council prepares any local environmental plan, or

(b) A consent authority determines a development application, or

(c) A public authority or person proposes to carry out development which does not require development consent, but which has the potential to adversely affect the riverine environment of the River Murray.

Items (b) and the latter part of (c) are applicable to the land under consideration.

1.5 Statutory Protection and the Burra Charter

All registered and unregistered Aboriginal archaeological sites in New South Wales are protected by State National Parks and Wildlife Act 1974, National Parks and Wildlife Amendment Act 2001 and Environmental Planning and Assessment Act 1979 and the Commonwealth Aboriginal and Torres Strait Islander Heritage Protection Act 1984. All historical sites in New South Wales are protected by the NSW Heritage Act 1977 and the Environmental Planning and Assessment Act 1979. These Acts prohibit the wilful destruction or disturbance of any cultural heritage site, place or object, whether on private or public land. These places are considered to have significance according to the guidelines of the Australian Charter for the Conservation of Places of Cultural Significance (the Burra Charter).

Department of Planning and Environment and specifically the Office of Environment and Heritage (Cultural Heritage Branch) are the NSW State Government agencies that administer the following Acts.

National Parks and Wildlife Act 1974 and the National Parks and Wildlife Amendment Act 2001. In NSW, the National Parks and Wildlife Act 1974 and the National Parks and Wildlife Amendment Act 2001 provide legislative protection for all Aboriginal (and historic) cultural heritage sites, places and objects. Section 90 of the National Parks and Wildlife Amendment Act 2001 states:

A person must not destroy, deface, damage or desecrate, or cause or permit the destruction, defacement, damage of desecration of, an Aboriginal object or Aboriginal place.

Section 87 of the National Parks and Wildlife Act 1974 refers to permits to research, excavate or collect Aboriginal objects or places.

Environmental Planning and Assessment Act 1979. The Environmental Planning and Assessment Act 1979 also recognizes the need to protect the cultural and natural heritage of New South Wales. It compliments the National Parks and Wildlife Act 1974 in that it provides for planning before development and it obliges the developer to consult persons with relevant expertise or experience. The heritage scope of this legislation is wider than that of the National Parks and Wildlife Act 1974 and there is no doubt that sites of significance to contemporary communities are included.

Aboriginal and Torres Strait Islander Heritage Protection Act 1984. This Commonwealth Act provides for the blanket protection of all Australian Aboriginal and Torres Strait Islander archaeological sites, places and objects whether privately or publicly owned. Whereas the State provides legislative protection for all physical evidence of past Aboriginal occupation, the Commonwealth Act also protects Aboriginal cultural property in the wider sense to include contemporary and ancient traditions and folklore. Importantly, this Act recognises that the Aboriginal people of NSW are the prior occupants of this State and the owners of their heritage and heritage sites regardless of public or private land ownership.

Heritage Act 1977. Historical sites in NSW are protected by the Heritage Act 1977. The act is designed to conserve places or items of historic, scientific, cultural, archaeological, natural or aesthetic significance to local communities or to the State. Items of particular importance are listed on the State Heritage Register. The Heritage Council of NSW is responsible for ensuring that listed sites are protected. Major changes to a heritage site require the approval of the Heritage Council.

The Burra Charter. The Australian Burra Charter was adopted at a conference at the historic mining town of Burra, South Australia, in 1979. This charter defines the procedures and basic principles to be followed in the preservation of all types of sites. For example, Aboriginal shell middens, ancient campsites represented by stone artefact scatters, or historic mining shafts. These places are considered to have cultural significance either to Aboriginal people or to Australians in general. Cultural significance is a term used to encompass all the meanings and values that a particular place may have to people, beyond its utilitarian value. It refers to 'aesthetic, historical, scientific or social value for past or present generations, or for its likely value to future generations' (Marquis-Kyle and Walker 1992).

Under the guidelines of The Burra Charter any Aboriginal sites found in the area will have social value. According to the charter, social value is defined as:

… the qualities for which a place has become a focus of spiritual, political, national, or other cultural sentiment to a majority or minority group (Marquis-Kyle and Walker 1992).

Some sites in the area may also have scientific value. This is assessed according to each particular site's research or scientific potential to provide information about past Aboriginal culture, the environment, or human behaviour generally. According to the Burra Charter:

The scientific or research value of a place will depend upon the importance of the data involved or its rarity, quality or representativeness and on the degree to which the place may contribute further substantial information (Marquis-Kyle and Walker 1992).

While the scientific or research value of a place may vary, the Moama Local Aboriginal Land Council considers all Aboriginal archaeological sites to be significant. The Aboriginal people of the area have a very ancient and unique traditional culture and these sites are important to them because they are a link to their ancestral lands and help to keep their traditional culture alive.

2. Site Assessment

2.1. Methodology

Preparation of this report involved collation of relevant archaeological and environmental information and the use of aerial imagery and topographic maps to identify areas with archaeological potential. Preliminary field assessment was conducted on 12th August 2017 by Mr Peter Clinnick (AES) together with Mr Phil Hudson representing the Moama Local Aboriginal Land Council.

Survey Strategy

The survey was designed to firstly inspect anywhere in the vicinity of the proposed rezoning area with the potential to contain aboriginal artefacts or skeletal remains and secondly to locate any older trees, which may show evidence of Aboriginal scarring. Thirdly, historical heritage was taken into consideration.

The proposed development area and surrounding land was surveyed by walking along a number of transects distributed across the proposed works areas and around the perimeter. Within the survey area there has been considerable site disruption from trucks and small machinery movement when a sawmill once occupied the site. Red gum (*Eucalyptus camaldulensis*) and Grey box (*E. microcarpa*) within and close to the site were inspected. Many of the trees are less than 50 years old and are not considered as having potential to be scarred trees. The forested area surrounding the site extends south to the river. Aerial

photography was assessed for any patterns or signs of historical evidence of occupation or site activities relating to Aboriginal and European heritage.

Management considerations: These detail the potential threat to the site specifically in terms of the development works. In addition, specific ameliorative measures are recommended if warranted. In some cases the recommendation is simply that no active management is necessary apart from avoiding any established site during the course of the development works.

2.2 Types of Sites

The types of archaeological site which have been recorded previously in southern NSW, which might therefore be expected to occur in the Moama area are described below.

Digital orthophoto maps of the region produced by the Murray-Darling Basin Commission were examined to determine the geomorphic context of the proposed development area.

Local and regional archaeological studies have shown that most Aboriginal sites in the Moama region are concentrated on the Murray River, with scarred trees far outnumbering stone artefact scatters and shell middens (e.g. Bonhomme, 1990). The paucity of stone artefact sites is generally believed to be a product of distance from highland stone sources.

Open campsites

Open campsites are one of the most commonly occurring types of archaeological site in the region. These sites are represented by scatters of stone artefacts lying on the ground surface. The remains of fire hearths may also be associated with the artefacts. In rare instances, open campsites which were used over a long period of time may have accumulated sediments and become stratified. That is, there may be several layers of occupation buried one on top of another.

The open campsites are almost invariably located near permanent or semi-permanent water sources. Local topography is also important in that campsites tend to occur on level, well-drained ground elevated above the local water source. In the Moama area they are most likely to be located on river terraces and along creeks and also around the margins of lakes and wetlands.

Freshwater shell middens

Shell middens are deposits of shell and other food remains accumulated by Aboriginal people as food refuse. In inland SE Australia these middens typically comprise shells of the freshwater mussel (*Velesunio ambiguus*), or the river mussel (*Alathyria jacksoni*). Freshwater middens are most frequently found as thin layers or small patches of shell and

often contain stone or bone artefacts and evidence of cooking. Such sites are relatively common along the Murray River and its tributaries.

Earth mounds

Earth mounds may have been used by Aboriginal people as cooking ovens or as campsites. They are common along the Murray River and in the Wakool District further to the north. Originally they appear to have ranged from 3 to 35 metres in diameter and from 0.5 to 2 metres in height. Today, however, they may be difficult to recognise because of the effects of ploughing, grazing and burrowing rabbits. Earth oven material, stone artefacts, food refuse and the remains of hut foundations have been exposed in some excavated earth mounds.

Quarry sites

These are locations where Aboriginal people obtained ochre for their art and decoration. Materials commonly used for making flaked stone tools include chert, silcrete, quartz and quartzite were not freely available in the area and were obtained by trade.

Carved trees

These are trees on which Aboriginal people have cut designs through the bark onto the wood beneath. They are thought to have once had a wide distribution in SE Australia, but because of age and widespread tree clearance few remain today. Ethnohistoric records indicate that some carved trees were associated with burials whilst others may have been sacred or totemic sites.

Scarred trees

Slabs of bark were cut from trees by Aboriginal people and used for a variety of purposes including roofing shelters and constructing canoes, shields and containers. Scars also resulted from the cutting of toe holds for climbing trees to obtain honey or to capture animals such as possums. The classification of scarred trees as natural, European or Aboriginal is often problematic; however, if the scar is Aboriginal the tree must now be more than 150 years old.

Burial grounds

Aboriginal burial grounds may consist of a single interment or a suite of burials. In the drier parts of western NSW skeletal material is regularly found in eroding sand deposits, but near the slopes of the Great Dividing Range burial sites are rare because conditions for the preservation of bone are usually poor.

Historic sites

Historic sites in the Moama area relate mostly to the arrival of European agriculturalists and associated industries last century and the development of maritime transport routes along the Murray River. Old homesteads and associated structures, such as work sheds, barns and wells are examples. Small bridges made from wood or stone and old railway sleepers may also be encountered. Less conspicuous sites include historic mileage markers and navigation markers which are also of historical interest.

3. Aboriginal and European Heritage

An archaeological survey of the subject site and surrounds was undertaken to determine the potential impacts of any proposed rezoning in relation to Aboriginal and European cultural heritage.

3.1 Aboriginal Setting

The Bangeranng Nation covered country from near Shepparton across to Echuca, up to Deniliquin (N.S.W.) back across to Finley, down to Katandra. The Yorta Yorta, Bangerang and Yabula Yabula group of languages are spoken by various groups whose ancestral homelands radiated from the junction of the Murray and the Goulburn extending into New South Wales. The Yorta Yorta Native Title Claim in the 1990s related to the lands of the entire group. The tribes within the Bangerang Nation consisted of the Moirathban, Toolinyagan, Wolithiga, Kailthban, Ngarrimowro, Angootheraban and the Pikkolatpan.

The Yorta Yorta/Bangerang group is comprised of indigenous persons biologically descended from the original occupiers or adopted into and/or otherwise accepted as part of this group. The name 'Yorta Yorta' is preferred by most of the descendants of the original Aboriginal occupiers of the area today, although some prefer to use the word 'Bangerang'. The two names refer to descendants of one and the same group.

The Aboriginal earth mound at Algeboia Aboriginal Place, located approximately 21 km northeast of Moama, is an indicator of the long-term presence of Aboriginal people in the area. This earth mound is one of many that can be found in the Murray River region. Earth mounds are generally located near rivers, lakes or creeks, and they are often on low sand dunes, as is the case at Algeboia.

3.2 Background Archaeology and AHIMS search

An understanding of the Aboriginal archaeology of southern NSW has begun to emerge from studies of the Barmah Forest (Bonhomme, 1990). Aboriginal burial sites along the Murray River are described by Webb (1984) and Pardoe (1988).

Bonhomme's (1990) study of the Aboriginal archaeology of the Barmah Forest provides a detailed account of the regional ethnohistorical record and the different types of Aboriginal site present along the Murray River. Her survey located 182 sites of which 88 were scarred trees, 86 were mounds, five were shell middens, two were stone artefact scatters and one was a burial site. These were distributed across a range of environments with most of the habitation sites closely associated with water sources such as streams and swamps. Most of the scarred trees recorded by Bonhomme were box (78%) with the remainder River Red Gums.

According to the NSW Department of Environment and Conservation (DEC) Aboriginal Heritage Information Management System (AHIMS), one Aboriginal site has been recorded previously within 1 km of the proposed development area. The report and site card provided by AHIMS indicates that there are also three scar trees located close to Perricoota Road, approximately 1.7 km south west of the current study area.

In addition, there have been numerous Aboriginal cultural heritage finds located across the Murray River in Victoria (Rhodes and Long, 2015). There is extensive evidence of Aboriginal occupation with scar trees, middens and artefact scatters distributed along the Campaspe and Murray rivers. Sand hills with possible burial sites are also evident on the Victorian side of the Murray River (Rhodes and Long 2015). There are several other scar trees located near Lignum Road, another about 100 m south of the proposed rezoning site, one near the Murray River slipway and another modified scar tree on the Victorian side of the river, 250 m south of the Moama Wharf (Refer AHIMS Records and Reports - Appendix 2).

3.3 Results and Discussion

Water courses would have been the foci of Aboriginal occupation in the local area. The property site location is on the Murray River means that it would have attracted Aboriginal occupation and may have been part of a hunting and gathering area. However, this site is situated on uniformly compacted medium clays and consequently has little potential for stratified cultural material at depth. The vast majority of these materials were deposited as part of the Murray River floodplain sequence long before Aboriginal people arrived in Australia (~45,000 years ago). It is only in recent times (<550 years) that the river has dissected this part of the floodplain. Consequently, any archaeological potential is limited to the surface.

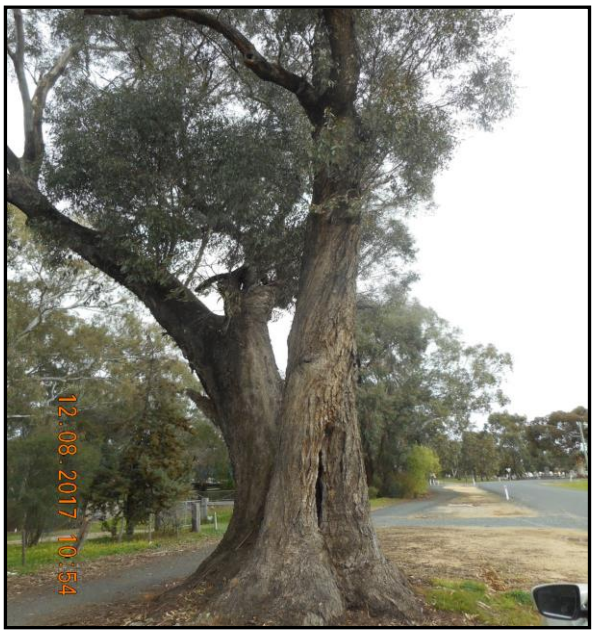

Figure 5 a and b. Scar tree located on the roadside, outside the study site

Scar tree

Despite extensive ground exposure across the site, No stone artefacts or pieces of bone were observed. A scar was discovered on a tree on the road reserve on the northern edge of the rezoning (Figure 5a and 5b). The elliptical scar is approximately 170 cm in length and originally may have been about 30 cm in width and originates from 60 cm from the base of the tree.

Table 1. Site GPS reference for the scar tree

Location	***Easting 55H***	***Northing 55H***
Site 1 Scar tree	297435	6001727

There were no European historic sites located within or Lot 26.

Aboriginal concerns

Aboriginal people living in southern NSW are concerned about any development that might impact upon Aboriginal sites in the region. Phillip Hudson of the Moama Local Aboriginal Land Council (MLALC), met with the survey co-ordinator and inspected the proposed development area and adjacent property areas.

The Aboriginal representatives have no objections (Refer MLALC letter – Appendix 2) to the proposed development works proceeding provided the scar tree identified on the roadside reserve is protected for harm. A 5 m buffer is requested for the scar tree by the MLALC (Appendix 2). There are no existing or proposed threatening processes that will affect the scar tree.

The location of the scar tree is to be recorded by the MLALC. The land owners are aware of its location and will take all precautions to ensure that the tree is protected from damage.

4. Mitigation measures

Cultural heritage encountered during construction

Previous archaeological studies in the region suggest that stone artefact scatters, isolated artefacts and earth features are the only possible Aboriginal cultural heritage in the proposed development area. In the unlikely event that additional items of Aboriginal cultural heritage are uncovered during the proposed activity, the person who discovers the Aboriginal cultural heritage during the activity will immediately notify the person in charge of the activity. The person in charge of the activity must then suspend works at the location of the find and put in place a buffer zone with a radius of 25 m to temporarily protect the find and ensure that it is not further disturbed.

To ensure compliance with legislation in place to protect Aboriginal sites and objects in NSW the inclusion of the following conditions are recommended to ensure that no additional harm is caused should Aboriginal sites or objects be encountered.

If any Aboriginal object is discovered and/or harmed in, or under the land, while undertaking the proposed development activities, the proponent must:

1. Not further harm the object;
2. Immediately cease all work at the particular location;
4. Secure the area so as to avoid further harm to the Aboriginal object;
5. Notify OEH as soon as practical on 131 555, providing any details of the Aboriginal object and its location; and
6. Not recommence any work at the particular location unless authorised in writing by OEH.

Discovery of human remains

If any suspected human remains are found during any activity, works must cease. The NSW Police and the State Coroner's Office and OE&H should be notified immediately. Below are three basic steps that should be followed in the event that human remains are uncovered:

1. Discovery

- If suspected human remains are discovered, all activity in the vicinity must stop to insure minimal damage is caused to the remains;
- The remains must be left in place and protected from harm or damage.

2. Notification

- Once suspected human skeletal remains have been found, the Coroner's Office and the NSW Police must be notified immediately;
- All details of the location and nature of the human remains must be provided to the relevant authorities.

3. Reburial

- Any reburial site(s) must be fully documented by an experienced and qualified archaeologist, clearly marked and all details provided to National Parks;
- Appropriate management measures must be implemented to ensure that the remains are not disturbed in the future.

Conclusion

Based on the results of this investigation and consultation with the Moama Local Aboriginal Land Council it is recommended that the existing scarred tree on the road reserve is protected for harm.

1. Accordingly, there is a requirement for a 5 m protection buffer around the tree on the road reserve with orange netting to be erected prior to the commencement of construction and remaining in place until construction is completed.
2. There are no other specific management strategies required for the " rezoning area" and no impediment to any proposed works proceeding.

There will be no impact whatsoever relating to Aboriginal or European cultural heritage providing the roadside tree is protected.

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Appendix 1 – Aboriginal places and sites in the area

Aboriginal Place -Algeboia

Item details

Name of item: Algeboia

Type of item: Complex / Group

Group/Collection: Aboriginal

Category: Occupational site

Location: Lat: -35.9637193956 Long: 144.898007209

Primary address: Mathoura, NSW 2710

Local govt. area: Murray

Hectares (approx): 85

There is an Aboriginal earth mound at Algeboia Aboriginal Place.

Why is it important to Aboriginal people?

The Aboriginal earth mound at Algeboia Aboriginal Place is an indicator of the long-term presence of Aboriginal people in the area. This earth mound is one of many that can be found in the Murray River region. Earth mounds are generally located near rivers, lakes or creeks, and they are often on low sand dunes, as is the case at Algeboia.

Earth mounds usually have been created over time where Aboriginal people used an area for cooking and living. Aboriginal people often cooked food in earth ovens that were created by heating stones or lumps of clay and laying them in a pit and then placing the food on top. The pit was then filled in for the food to cook. Once the food was cooked, all the stones, clay and ash were swept away and this debris built up over time to form a mound. These ovens and fires were usually located next to huts or shelters, and the earth mounds show that Aboriginal people lived in the area for thousands of years.

Algeboia Aboriginal Place provides local Aboriginal people with a connection to their culture and their past.

Date significance updated: 04 May 15

Note: There are incomplete details for a number of items listed in NSW. The Heritage Division intends to develop or upgrade statements of significance and other information for these items as resources become available.

Description

Physical description: What's on the ground?

There is an Aboriginal earth mound on a red sand dune. Remains of freshwater shellfish, burnt clay nodules from oven mounds, pieces of ochre, and human skeletal remains can be found around the eroding dune. There is a scarred tree at the base of the dune.

Nature of the environment

The vegetation comprises low lying rye grass and scattered tussock grasses.

Further information: Located within Murray Valley National Park

Current use: Unknown

Listings

Heritage Listing	Listing Title	Listing Number	Gazette Date	Gazette Number	Gazette Page
NPW Act - Aboriginal Place	NSW Government Gazette		26 Oct 90	133	9558

Nearby Aboriginal Sites (AHIMS Database) and Site Card

Office of Environment & Heritage

AHIMS Web Services (AWS)
Search Result

Purchase Order/Reference : 203
Client Service ID : 26

Monique Curtain
662
Simmie Road Victoria 3564
Attention: Monique Curtain
Email: info@environmentalsystems.com.au

Date: 02 March 2

Dear Sir or Madam:

AHIMS Web Service search for the following area at Lot : 11, DP:DP285511 with a Buffer of 1000 meters, conducted by Monique Curtain on 02 March 2017.

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

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

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

Office of Environment & Heritage

Web Services (AWS)

Your Ref/PO Number : 30082017-2

Client Service ID : 298723

Note: This Excel report shows the sites found in AHIMS on the 30/08/2017. If this date is not the same as the original date of the Search Results letter obtained during the Basic Search, then the search results might be different. The PDF version of this report will always coincide with the Basic Search Results letter.

Site ID	Site name	Datum	Zone	Easting	Northing	Context	Site status	Site features	Site types	Recorders	Longitude GDA94	Latitude GDA94
59-2-0007	Site 1;Griffith;	AGD	55	297000	6000800	Open site	Valid	Modified Tree (Carved or Scarred) : -	Scarred Tree	Mr.Allan Lance	144.75	-36.11
59-2-0008	Site 2;Griffith;	AGD	55	297000	6000750	Open site	Valid	Modified Tree (Carved or Scarred) : -	Scarred Tree	Mr.Allan Lance	144.75	-36.12
59-2-0009	Site 3;Griffit	AGD	55	298050	6000	Open	Valid	Modified Tree (Carved or	Scarred Tree	Mr.Allan	144.76	-36.12

	h;				60 o	site		Scarred) : -		Lance		

National Parks and Wildlife Service
BOX N189, GROSVENOR STREET POST OFFICE, SYDNEY, NSW 2000. TEL (02) 237 6500
Standard Site Recording Form Revised 5/88

59–5–0001

NPWS Code

1:250,000 map sheet:

250K 296600 250K 6041000

AMG Grid reference 294460 mE | 6041/0 mN
Full reference - please include leading digits
25K 5/6 25K
IRS 9/7/90 2/946 60/041

Scale of map used for grid reference [✓] 25K, ~~50K~~ (preferred) [ ] 100K [ ] 250K
Please use largest scale available

1:25K, ~~50K, 100K~~ map name: TATALIA 7825-4-1

HEAD OFFICE USE ONLY:
NPWS Site no: 59-5-1
Site types: Scarred Trees
Accessioned by: RCL Date: 24-1-90
Data entered by: RCL Date: 24-1-90

Owner/Manager:
Address:

Site name: Site One ~~Locality~~/property name: River World Theme Park

NPWS District: Griffith Region: ~~Moama~~ Western

Reason for investigation (give R.O. instruction no. where applicable):
Survey required by N.P.W.S. NSW.

Portion no: Other land category:
Parish: County:

Air photo refs. (for stereo pair)

Photos taken? Yes/~~No~~
How many attached? Nil

How to get to the site (refer to permanent features, give best approach to site eg. from above, below, along cliff. (Draw diagram on separate sheet.)
Site is found in southwestern corner of development area approx 80m north of Perricoota Road boundary Approach from Moama-Barham Main Road 1.25km west of Moama

Other sites in locality? Yes/~~No~~ Site Types include: Scarred Trees
Are sites in NPWS Register? Yes/~~No~~

Have artefacts been removed from site? ~~Yes~~/No/~~don't know~~. ~~When~~?
By whom? Deposited where?

Is site important to local Aborigines? Yes/~~No/don't know~~.
Give contact(s) name(s) + address(es) Moama Local Ab. Land Council P.O. Box 99 Moama NSW 2731

Contacted for this recording? Yes/~~No~~
(Attach additional information separately) If not, why not?

~~Verbal~~/written reference sources (including full title of accompanying report). NPWS Report Catalogue #
An archaeological survey of River World Theme Park Moama NSW. Report prepared for Anutech Pty Ltd, Canberra.

Checklist:
surface visibility, damage/disturbance/ threat to site

Condition of site: Good. Trees are healthy but some scars show signs of flaking due to cattle rubbing against them.

Recommendations for management & protection (attach separate sheet if necessary):
Nil, Trees are in no danger from development If developer wishes to incorporate trees in public display should contact NPWS & M.L.A.L.C.

Site recorded by: V. Edmonds Date: July 11-12, 1989
Address/institution: 39 School Road Dareton NSW
C. Walker - P.O. Box 99 Moama NSW 2731

Appendix 2. Moama Local Aboriginal Land Council Letter

Moama Local Aboriginal Land Council
52 Chanter Street, Moama NSW 2731 Phone: 0354 862071 Fax: 0354 826085
PO Box 354, Moama NSW 2731 e-mail: admin@maomalalc.com.au ABN: 95 695 710 168

Wednesday, 23 August 2017

Mr Peter Clinnick
Managing Director
Advanced Environmental Systems
Suite2/75 Hume Street
Echuca Vic 3564

Boundary Road: Lot 26: DP 751152
DP 509954
Proposed Development: Holiday Units

Attention: Peter

Our representative for Moama Local Aboriginal land Council, Mr Phillip Hudson attended the site at Boundary Road, Moama NSW.

Within the development of Boundary Road Road Moama, there are no visible signs of Aboriginal Sites following inspection by Mr Phillip Hudson on 12/08/2017.

Moama Aboriginal Land Council confirms that the site relating to the above mentioned development application has not brought any objects to our attention and that during our visual inspection conducted, there was no evidence of Aboriginal artefacts e.g. 'Scar Trees', 'Shell Middens' or other items of cultural importance to the local Aboriginal people from Moama Local Aboriginal Land Council on the above mentioned site. However if any artefacts are located in the process of your development please contact Moama Local Aboriginal Land Council immediately to discuss and negotiate a plan of action in cooperation with your project.

However: There is a "Scar Tree" at the entrance of the development. Recommendations to protect this Scar Tree are as follows: 5 x metre buffer Zone around this tree to be erected before construction starts and to be removed when construction finished. (Orange lagging or netting to be used).

If you have any further questions regarding the above assessment please contact the Moama Local Aboriginal Land Council on contact details below.
Phone: 03 5482 6071
E-mail: admin@moamalalc.com.au

Kind regards

Mr Phillip Hudson
Site Officer
Moama Local Aboriginal Land Council

ABORIGINAL LAND RIGHTS ACT, 1983 NOTIFICATION OF CONSTITUTION OF AN AREA AS A LOCAL ABORIGINAL LAND COUNCIL AREA Government Gazette of the State of New South Wales (Sydney, NSW: 1901 - 2001) Friday 17 May 1985 [Issue No.82] p 2133
*The Moama Local Aboriginal Land Council is incorporated under the Aboriginal Land Rights Act 1983 (ALRA).

Appendix 3. Glossary

Archaeological site

A place with evidence of past human activity. This evidence may include Aboriginal and/or historic artefacts, features, structures or organic traces.

Artefact scatter

A surface scatter of Aboriginal or historic cultural material. Scatters of stone artefacts are a common archaeological site type. These scatters may also contain charcoal, discarded animal bones, shell and ochre.

Assemblage

A collection of artefacts from a single archaeological site.

Blade

An elongated flake, usually twice as long as it is wide.

Burial site

A place with a concentration of human remains. Ochre, stone tools, charcoal and grave goods may be associated with burials. Most burial sites are found in sand dunes but dead trees, caves and rockshelters were also used.

Chert

A fine-grained opaline rock ranging in color from white to black, but most often grey, brown, grayish brown and light green to rusty red.

Core

A piece of stone from which flakes have been removed. They usually have negative flake scares that have resulted from the removal of flakes.

Cortex

The original, weathered surface of a rock or mineral.

Cultural material

Any material remains or objects resulting from human activity.

Flake

A piece of stone detached from a core that typically displays a striking platform, bulb of percussion and flake scars on the ventral surface.

Flaked piece

Small fragments of stone resulting from the manufacture of stone tools. A striking platform or bulb of percussion may not be evident.

Formalized tools

An artefact that has been deliberately shaped by flaking, retouch or grinding to produce a predetermined tool type. Examples include scrapers, backed artefacts and axe heads.

Ground surface visibility

The amount of bare ground exposed, usually expressed as a percentage.

in situ

An artefact or other feature that has not been disturbed from its original position.

Isolated artefact

An isolated artefact is defined as five or less artefacts in a ~100m^2 area.

Microblade

Small blade more than twice as long as it is wide.

Microlith

A symmetrical tool backed along a thick margin and pointed at both ends. It is a component of the Australian Small Tool Tradition.

Quarry

An outcrop of stone or ochre where Aboriginal people have extracted the raw material for use or trade. Stone quarries are identifiable by a dense scatter of broken stone and flakes or consist of pits or hollows where material has been dug out of the ground.

Quartz

Quartz is a silica mineral resistant to weathering because of its hardness. It is commonplace in the landscape as a consequence.

Quartzite

A metamorphic rock formed by the re-crystallization of quartz.

Retouch

A stone artefact with fine, secondary flaking along one or more edges.

Scarred tree

A tree with a scar on its trunk caused by bark removal. A scar may have been produced by Aboriginal people but more often by natural processes.

Scraper

A flake, flaked piece or core with retouch on one or more edges. Scraper types include steep edge, thumbnail and side.

Shell midden

A surface scatter or heap of discarded shell often with charcoal, animal bones and stone artefacts. Middens may found near coastlines, rivers, creeks, swamps and ancient lakes.

Silcrete

A hard, fine-grained rock composed of silica cement.

Stratified deposit

Material that has been laid down over time forming a sequence of events.

Subsurface testing

A method of excavation used for detecting cultural material below the ground surface. Testing is commonly by shovel, trowel or hand auger.

Survey

An inspection of land either by foot or vehicle for the purpose of identifying archaeological sites.

Transect

A predetermined area or a path that directs the course of a survey.