Item 10.3. Planning Proposal, North Bungendore

SUBJECT	Planning proposal, rezoning of Lot 1 DP 798111 from RU1 Primary Production to R2 Low Density Residential, R5 Large Lot Residential and RE1 Public Recreation, north Bungendore		
FILE NO.	PROJ0035/11	**DIVISION**	Planning and Environmental Services

Attachments

1. Planning Proposal prepared by DFP Planning Pty Ltd (dated 13 October 2014), rezoning of Lot 1 DP 798111 from RU1 Primary Production to R2 Low Density Residential, R5 Large Lot Residential and RE1 Public Recreation
2. Amended, *Palerang Local Environmental Plan 2014* Land Zoning Map 4A

Synopsis

Council has received a planning proposal to rezone Lot 1 DP 798111, on the northern edge of Bungendore from RU1 Primary Production to R2 Low Density Residential, R5 Large Lot Residential and RE1 Public Recreation. The rezoning would enable a subdivision application to be submitted for the creation of approximately 309 residential lots (exclusive of the 500 metre radius from the boundary of Lot 1 DP 798111 and Lot 44 DP 754876).

Recommendation

Recommended that:

1. Council forward the planning proposal, council report and recommendations to the Minister for Planning and Environment for a gateway determination;
2. the area within Lot 1 DP 798111 500 metres from the boundary of Lots 8 and 44 DP 754876 and Lot 1 DP 1087861 remain zoned RU1 Primary Production in the consideration of the planning proposal in accordance with the Land Zoning Map attached to this report, and
3. environmental assessments consider the area inside area instead the 500 metre radius in addition to the area outside of the radius.

Report

Background

Council has received a planning proposal for the rezoning of Lot 1 DP 7988111 from RU1 Primary Production to R2 Low Density Residential, R5 Large Lot Residential and RE1 Public Recreation. The rezoning would enable a subdivision application to be submitted for the creation of approximately 309 residential lots (exclusive of 500 metre radius from the boundary of Lot 1 DP 798111 and Lot 44 DP 754876). It is possible that if this proposal proceeds and the land is developed that land adjacent to the north of Lot 1 DP 7988111 may be the subject of another planning proposal (see p1 of the planning proposal for associated comment).

The planning proposal has been prepared by the applicant's planning consultant. Under Part 3 of the *NSW Environmental Planning and Assessment Act 1979,* Palerang Council is the *relevant planning authority* and is responsible for the preparation and carriage of the planning proposal. In this instance, Council has several options in regard to the management of the planning proposal:

- Forward the council report, recommendations and planning proposal prepared by the developer to the Minister for Planning for a gateway determination. Council's recommendations will be considered by the gateway panel. If the proposal is supported by the gateway panel, Council may prepare a revised planning proposal following consideration of the environmental assessments required by the panel and submit this to the gateway panel for further consideration.
- Council could prepare its own planning proposal and submits this to the Minister for Planning for a gateway determination. The planning proposal would reflect council's preferred approach.
- Council could determine that it does not support the planning proposal. In this event the planning proposal would not be submitted to the Minister for Planning for a gateway determination.

There has been no community or government agency consultation except for a request for comment from Council in regard to the landfill and residential development to the NSW Environmental Protection Authority and for the NSW Office of Environment and Heritage to inspect areas of native vegetation on the lot. The Environmental Protection Authority provided a response to Council's letter on 15 October 2013 and the Office of Environment and Heritage undertook a site inspection with Council staff on 19 November 2014. The gateway determination will specify the extent of public consultation required and the government authorities that need to be consulted.

The planning proposal process

A planning proposal is a document that explains the intended effect of the proposed local environmental plan or amendment provides the justification for making it and facilitates the process. The intention of the gateway process is to allow the proposal to be reviewed

at an early stage so that a decision whether to proceed can be made; before significant resources are committed. The process is outlined below:

- Council determines whether it supports the planning proposal
- If the planning proposal is supported, it is forwarded to the Minister for Planning for a gateway determination or a planning proposal written by council is submitted
- if the gateway determination permits the planning proposal to proceed, any required assessments will be undertaken, the planning proposal will be sent to relevant government agencies for comment and then exhibited for the period stated on the gateway determination
- submissions are considered by Council and the Council report, submissions and if required a revised planning proposal is sent to the Minister for Planning
- if the proposal is supported by the Minister, the local environmental plan is amended

Only the planning proposal and supporting documents are exhibited. The written legal instrument (draft amending local environmental plan) is prepared by the Parliamentary Counsel when the planning proposal is finalised, immediately before it is made by the Minister or his delegates. The local environmental plan takes effect when it is published on the NSW government legislation website.

Further information on the process can be found in the NSW Department of Planning and Infrastructure documents *A guide to preparing local environmental pla*ns and *A guide to preparing planning proposals.*

Outline of the planning proposal submitted by the developer (October 2014)

The planning proposal concerns Lot 1 DP 798111 which is 82.03 hectares (Palerang Council property data base). The land is zoned RU1 Primary Production under the *Palerang Local Environmental Plan 2014.* It is proposed that Lot 1 DP 798111 be rezoned part R5 Large Lot Residential, part R2 Low Density Residential and part RE1 Public Recreation.

Appendix E of the planning proposal illustrates the proposed land use zoning and the proposed lot layout and road hierarchy are shown in Appendix D. In Appendix E there is an area showing a radius of 250m and 500m from the boundary of Lots 8 and 44 DP 754876 and Lot 1 DP 1087861. This area relates to the Bungendore landfill, the details of this are discussed later in this report.

The proposal (p5) states that the indicative lot yield is approximately 309 lots (exclusive of the 500 metre radius from the land fill site). The lots are proposed to be between 800 and 1200 square metres (p6). It is proposed that area inside the 500 metre radius would be developed however, this is dependent on the outcome of the assessments being undertaken in relation to the landfill.

Included with the planning proposal is a flora and fauna assessment prepared in December 2010.

Note

The planning proposal and accompanying report are only discussing broad concepts, the layout of the lots and design of roads and associated infrastructure is undertaken as part of the subdivision application process once the land has been rezoned.

The following section comments on the matters contained in the planning proposal.

Natural environment

The planning proposal is accompanied by a flora and fauna assessment which was undertaken in December 2010. The report identifies several areas of native vegetation that may be classed as the endangered ecological community Natural Temperate Grassland of the Southern Tablelands of NSW and the Australian Capital Territory under the *Environmental Protection and Biodiversity Protection Act 1999* (a Commonwealth Act). The sites of interest are; NBUN04, NBUN05 and NBUN06 and possibly another site on the western side not identified in the flora and fauna assessment attached to the planning proposal.

On 19 November 2014, Council staff undertook a site inspection with staff from the NSW Office of Environment and Heritage to consider the above areas of native vegetation. It was noted that part of the lot has recently been sprayed for the control of noxious weeds but there were two areas (NBUN04 and NBUN05) that are consistent with Natural Temperate Grassland and the endangered ecological community definition. The Office of Environment and Heritage have advised that there is a high likelihood of *Suta flagellum* (Little Whip Snake) being found in the areas of native vegetation and that a survey for this species should be undertaken. The survey would involve the laying of tiles in transects in the areas of native vegetation across the lot and then checking the tiles for the reptiles in Autumn.

Coupled with the requirement for further assessment and survey work is the need to manage any identified grassland areas. The planning proposal shows the sites identified as having conservation value as being zoned RE1 Public Recreation. It is suggested that this is inappropriate for the following reasons:

- The areas zoned RE1 Public Recreation will be surrounded by dwellings and residents will expect that the areas of open space could be used for active recreation such as bike riding and the walking of dogs and free of restrictions that would be associated with areas of high conservation grassland. These activities will result in the destruction of the native vegetation and any reptiles that are present.
- Council is not an appropriate authority to manage areas of high conservation value native vegetation as there are few funds to undertake noxious weed control, implement any strategies to reduce biomass such as fire or crash grazing and to monitor the health of the native vegetation and any associated fauna.
- Residents are not likely to feel comfortable that a potential fire hazard is in close proximity to dwellings and will request that the grass be slashed. Not only is this costly

but the slashing of high conservation value native vegetation should only be undertaken at particular times of the year.

It is unlikely that a state government agency would be willing to manage the areas of native vegetation as they will be problematic for the above reasons and an agency may not be able to meet their organisation objectives such as the conservation of native vegetation of high conservation value. The zoning of the land E2 Environmental Conservation would not assist with the above situation.

It is suggested that one option to manage the areas of high conservation value may be to create a biodiversity offset. The creation of an offset would require the purchase of land within in the region with similar conservation values. A legal agreement would ensure the ongoing management of the offset area. The high conservation value areas in the proposed development would then not need to be retained. One of programs enabling this process is biobanking which is administered under the *NSW Threatened Species Conservation Act 1995.* Further details can be found on the NSW Office of Environment and Heritage website http://www.environment.nsw.gov.au. Options would be discussed with the NSW Office of Environment and Heritage and Council once further assessment had been completed.

Hazards

Bushfire

As all of Lot 1 DP 798111 is bushfire prone, a bushfire assessment will need to be undertaken and the planning proposal and assessment referred to the NSW Rural Fire Service and Fire and Rescue NSW.

Flood

Lot 1 DP 798111 is entirely outside of the flood planning area as shown on the Bungendore Flood Planning Map in the *Palerang Local Environmental Plan 2014.*

Heritage

The lot does not contain a heritage item included in the *Palerang Local Environmental Plan 2014* environmental heritage schedule or on the state heritage register.

Aboriginal cultural heritage

A cultural heritage assessment will need to be undertaken given the proximity to Lake George and the fact that some of the higher parts of Lot 1 DP 798111 have not been significantly disturbed.

European heritage

The planning proposal will need to be referred to Council's Heritage Advisor.

Potable Water Supply

Bungendore town water is sourced from groundwater which is then distributed via a reticulated system. The groundwater in the Bungendore area is managed through the *Water Sharing Plan for the Murrumbidgee Unregulated and Alluvial Water Sources 2012,* a plan made under section 50 of the *Water Management Act 2000*. From this plan, Bungendore has access to 472ML/year of groundwater, with 272ML/year available from the Turallo borefield, and 200ML/year from the Currandooly borefield. This amount is based on the consideration of the long term average annual extraction limits (LTAAEL), environmental flows, annual groundwater recharge and the needs of other users within the system.

Although Bungendore has access to 472ML/year, this is a maximum amount that is affected by extraction in the three years prior to the subject year. Under the water sharing plan, if water extraction exceeds LTAAEL, water extraction allowances will be reduced to return extractions to the LTAAEL (s32(3) and s35(2&3)) of the *Water Management Act 2000*. In essence, if Council's extraction levels are exceeded, the town's water allocation will be reduced until such time that the town's average extraction is equal to or less than the LTAAEL.

The water sharing plan does provide Council with the following benefits:

- The highest level of water security meaning that Council has first claim to available water, even in the event of drought
- The ability to access a 'spare' 50ML per annum of available water subject to meeting NSW Office of Water requirements

The planning proposal contains an estimate of the remaining available water within Council's licence, and whilst the method is generally satisfactory , the following observations are made:

- Available water has been set aside to allow for future in-fill development within Bungendore, and new greenfield developments should not jeopardise in-fill development.
- Water demand has been based on water usage for the town of Bungendore between the 2001/02 and 2013/14. This period of time includes a prolonged period of water shortage and Council imposed water restrictions and this does not represent typical demand.
- Total water consumption has been increasing since 2011/12
- Household water consumption has been increasing since 2011/12.
- Climate change has not been considered. Econtext (2012) found that the Bungendore locality (incorporating the alluvial water sources) would, by 2030, likely experience mean minimum temperatures of approximately 0.8°C higher than current averages, a decrease in annual rainfall of approximately 2.5% and an increase in evaporation of approximately 3.0%.

It is recommended that the following is undertaken:

- Assess available water under the licence using more appropriate water consumption data.
- Approach NSW Office of Water to investigate securing additional water under the water sharing plan.
- Approach large water users within the alluvial water source to ascertain their willingness to sell a portion of their water licence to Council.

In 2015, Council will be preparing an Integrated Water Management Strategy, the growth of Bungendore and water allocations will be considered as part of this work.

Water Supply

It is recommended that an initial network analysis and report outlining the methods proposed (and ability) to provide potable water flows and water pressure to comply with service levels for the whole site (and possibly for the northern property), be undertaken. The variation in pressures due to the topography should be considered, as there is approximately fifty metres elevation difference from the higher areas of the property to the lower levels near Tarago Road. The property to the north has sections at a higher elevation than this proposal for Lot 1. This may indicate that provision of a reservoir, together with the associated trunk mains, land and other services and controls.

Sewerage

Sewerage Treatment Plant Capacity

The recently upgraded Bungendore sewage treatment plant (STP) has a capacity of 5,000 equivalent persons (EP), although the STP is only operating at 3,000 EP at this time. The STP has been sized to accommodate the existing town boundaries, and has not provided excess capacity to service additional areas outside of these boundaries.

As the upgrade has been funded through the existing rates base and development within the town boundaries, it is not considered appropriate to commit existing spare capacity at the STP to a new development beyond these boundaries. Doing so would result in financial inequity as the community would be, in effect, subsidising any development outside the town boundaries. This would also remove the existing spare capacity in the STP, requiring further upgrades at the community's expense.

As such, the development may need to provide additional capacity at the Bungendore STP. The proposed development will add approximately 950EP to the network, excluding those areas within the landfill buffer area. If the Bungendore STP was to be upgraded, it would be necessary to increase the capacity to 8,000EP.

It is recommended that a network assessment and report outlining the methods proposed to connect to the sewerage reticulation system for this proposal be undertaken. Future growth needs to the north should be considered in this assessment.

Stormwater Management

Strategies for the management of urban stormwater runoff and its effects on flows and water quality on receiving waters or properties need to be considered. Water sensitive urban design principles should be considered. To reduce demands on the potable water supply, a recycled or raw water reticulation system could be considered and be integral to stormwater retention and detention facilities.

Traffic and Transport

Proposal

The proponent has supplied an indicative road layout for the development (Appendix C of the planning proposal) which has the following features:

- A collector road off Tarago Road running generally east-west (major access road)
- A major secondary access road running north-south along the approximate alignment of McCusker Drive
- Minor secondary access roads connecting to Simms Drive and Lithgow Place
- Pedestrian connections to Eyre Street and the eastern and western ends of Larmer Street
- Roads parallel to the east-west collector
- An approximate grid layout

It is not clear if the minor road connections or extensions to Ireland Place are to be physically connected to the existing roads, but it is noted that the existing road reserve for Ireland Place does not extend to the site boundary.

The proposal includes a number of roads that continue to the northern boundary of the subject site, which have been designated as "Possible Future Residential Subdivision". There is, however, no indication of potential lot yield from this area.

Traffic Generation Rates

The proposed development will yield approximately 309 lots, however, this is exclusive of the area within the 500 metre landfill buffer. The tables below indicate expected daily and peak hour volumes resulting from these lots.

Table 1: Presumptive increase in daily vehicle movements resulting from the development proposal

Source	Trips per lot (vehicles per day)	Total trips per day (vehicles per day)	Say
Palerang Council Section 94 Development Contributions Plan No. 9 For Street Upgrading at Bungendore	8	2472	2500
RTA Guide to Traffic Generating Development Issue 2.2	9	2781	2800

Table 2: Presumptive increase in peak hour vehicle movements resulting from the development proposal

Source	Peak hour trips	Total peak hour trips (veh/hr)	Say
Austroads GRD Part 4A Section 4.8	8-10%	200-280^	280
RTA Guide to Traffic Generating Development Issue 2.2	0.85 (vehicles per lot)	262.65	270

^ using 8% x 2500 and 10% x 2800

In addition to this, the indicative road layout (Appendix C) implies that the land to north of the subject lot (hereafter referred to as Area A) and within the landscape buffer (hereafter referred to as Area B) will be developed in the future. As there is no indication of the lot yield in these areas at this stage, the following assumptions have been made:

- Area A will be developed, and 50% of traffic from this development will use the major access road proposed in this planning proposal or existing roads within Elmslea (with the remaining 50% to use an additional future connection to Tarago Road north of the existing landfill).
- Area B will be developed and 100% of traffic from this area will use the major access road proposed in this planning proposal or existing roads within Elmslea.
- Lots in both areas will be 1,000m^2 with a frontage of 40m.
- All road reserves are 20m wide.
- 10% of Area A and Area B will be set aside as open space.
- 10% of Area A and Area B will be set aside as a landfill buffer.



Figure 1: Area A and Area B with 500m landfill buffer

Table 3: Lot Yield from Area A and Area B

	Area A	**Area B**
Site area	98.4 hectares	27.5 hectares
Landfill buffer	9.84 hectares	2.75 hectares
Open space	9.84 hectares	2.75 hectares
Developable area	78.72 hectares	22.0 hectares
Lot yield (@ 1,400m^2/lot including road reserve)	562	157
Proportion using Planning Proposal Access Road	50%	100%
Additional lots using Planning Proposal Access Road	281	157
Say	280	160
Total	**440**	

Table 4: Presumptive increase in daily vehicle movements resulting from Area A and Area B

Source	Trips per lot (vehicles per day)	Total trips per day (vehicles per day)	Say
Palerang Council Section 94 Development Contributions Plan No. 9 For Street Upgrading at Bungendore	8	3,520	3,500
RTA Guide to Traffic Generating Development Issue 2.2	9	3,960	4,000

Table 5: Presumptive increase in peak hour vehicle movements resulting from Area A and Area B

Source	Peak hour trips	Total peak hour trips (veh/hr)	Say
Austroads GRD Part 4A Section 4.8	8-10%	280-400^	400
RTA Guide to Traffic Generating Development Issue 2.2	0.85 (vehicles per lot)	374	370

^ using 8% x 3,500 and 10% x 4,000

It is likely that these assumptions will lead to an over-estimate of lot yield, however, in the absence of other information it is considered that this an appropriate starting point.

Table 6: Presumptive increase in daily vehicle movements resulting from Planning Proposal and Area A and Area B

Source	Trips per lot (vehicles per day)	Total trips per day (vehicles per day)
Palerang Council Section 94 Development Contributions Plan No. 9 For Street Upgrading at Bungendore	8	6,000
RTA Guide to Traffic Generating Development Issue 2.2	9	6,800

Table 7: Presumptive increase in peak hour vehicle movements resulting from Planning Proposal and Area A and Area B

Source	Peak hour trips	Total peak hour trips (veh/hr)
Austroads GRD Part 4A Section 4.8	8-10%	480-680^
RTA Guide to Traffic Generating Development Issue 2.2	0.85 (vehicles per lot)	640

^ using 8% x 6,000 and 10% x 6,800

Regional traffic impacts

The regional road network serving Bungendore has experienced rapid growth in traffic volumes in the recent past. Growth occurred due to an increase in through-traffic from vehicles travelling to the south coast, population growth within Bungendore and the opening of the Commonwealth Department of Defence facility, HQJOC. While many of these growth factors are outside of the scope of this planning proposal, a regional transport study should be prepared to allow Council to pursue funding opportunities with the State and Federal Government for the following key local and regional roads:

- Bungendore Road to the Federal Highway
- Macs Reef Road
- Tarago Road
- The Kings Highway

Approximately 60% of the working population of Bungendore travels outside the Palerang local government area for work. In addition, Canberra is a primary destination for Bungendore residents accessing health, education, commercial, retail and medical facilities. Growth within Bungendore will result in an increased demand on the above key roads, many of which are already experiencing high traffic volumes (as shown in Table 8) and other traffic issues. It is suggested that a regional transport study will be required in the planning for the growth of Bungendore.

Table 8: Existing Traffic Volumes on Regional and State Roads

Road	Site Number	Site Description	ADT	Date
Tarago Road	74	South of Turallo Creek	2798	February 2006
Tarago Road	117	North of Turallo Terrace	1640	September 2009
Tarago Road	259	South of Tip Entrance	2053	September 2012
Bungendore Road	77	Near Tarago Road	4998	April 2014
Bungendore Road	104	North of Macs Reef Road	1098	February 2012
Bungendore Road	110	Near Federal Highway	1126	January 2012
Macs Reef Road	103	Near Bungendore Road	3071	February 2012
Macs Reef Road	115	Near Federal Highway	4009	April 2014
Kings Highway	RMS Site	5km east of Tarago Road intersection	4,581	August 2014
Molonglo Street	165	South of King Street	4211	May 2013
Molonglo Street	166	North of King Street	4850	December 2008
Molonglo Street	281	south of Gibraltar Street	4495	May 2013

Local traffic impacts

The addition of approximately 300 new residences to the north of Bungendore will have a significant effect on local traffic routes and the operation of the existing road network.

Traffic is likely to use Elmslea when travelling to the town centre and when travelling to the areas to the east and south-east of Bungendore (such as Captains Flat, Braidwood and the south coast). Employment growth within the town centre over time will also lead to a gradual increase in traffic using roads within Elmslea.

The carriageway widths and nominal road capacity for roads within Elmslea that could reasonably expect an increase in traffic are shown in Table 9.

Table 9: Existing Road Dimensions

Road	Carriageway Width (m)
McCusker Drive	9.0
Ashby Drive	9.0
Hyland Drive	7.5
Simms Drive	7.5
Lithgow Place	6.0
Tarago Road	7.0

Existing traffic volumes for roads within Elmslea that have been surveyed are shown in Table 10.

Table 10: Existing Traffic Volumes

Road	Site Number	Site Description	ADT	Date
Ashby Drive	112	West of John Dwyer Crescent	1378	September 2012
McCusker Drive	124	East of Majara Street	1214	June 2012

The roads within Elsmlea have sufficient capacity to cater for the additional traffic demand, however, a traffic impact assessment (TIA) will need to be undertaken to assess the impact of the development. The assessment should be undertaken in accordance with *Austroads Guide to Traffic Management Part 12* (and relevant RMS supplements) and should specifically consider traffic impacts at the following intersections:

- New intersection with Tarago Road
- Tarago Road and Elmslea Drive
- Tarago Road and Ashby Drive
- Tarago Road and Turallo Terrace
- Tarago Road and Bungendore Road
- Molonglo Street and Malbon Street
- Molonglo Street and King Street
- Molonglo Street and Trucking Yard Lane
- Larmer Street and McCusker Drive
- Ashby Drive and McCusker Drive
- Majara Street and Malbon Street
- Hyland Drive and McCusker Drive
- Hyland Drive and Simms Drive
- Simms Drive and Lithgow Place

Although road capacity is not considered to be an issue at this time, a number of issues related to the use of roads within Elmslea are noted below:

- The extension of McCusker Street will require a new road to be constructed on a vacant lot between two existing houses on Larmer Street (Numbers 11 and 15). These houses are located relatively close to the boundaries of the vacant lot, particularly Number 15, which was approved with a 2.0m offset from its western boundary. Additionally, this building has bedrooms and bathrooms along the western side of the house. Privacy impacts on these dwellings will need to be considered in the TIA.
- The vacant lot has a 28.0m frontage, which is sufficient to accommodate the extended road, however this is offset from the road centreline. A deviation of McCusker Drive will be required, as well as consideration of the existing T-intersection to determine if a roundabout is required.

- The use of Hyland Drive, Lithgow Place and Simms Drive creates a potentially confusing traffic route. While this may be effective in deterring through traffic, narrow road widths may lead to concerns within the community about traffic volumes, traffic speeds and on-street parking.
- The use of Lithgow Place and Simms Drive as secondary accesses may lead to a loss of amenity for existing residents of these streets.

Pedestrian, cyclists and people with a disability

Council encourages increased cycling and walking rates within the community through the provision of suitable pedestrian and cyclist facilities. Planning for the development should consider pedestrians, cyclists and people with a disability through the provision of high quality shared, bike-only and pedestrian-only paths and suitable street furniture. The paths should tie into Council's adopted Pedestrian and Mobility Plan and internal transport routes.

Bungendore Landfill and Bungendore Resource Recovery Facility and Waste Transfer Station

Bungendore is currently served by a landfill located to the north of Bungendore. Over time, Bungendore has expanded to the north, and the nearest residential dwelling is located approximately 350 metres from the boundary of the landfill site.

The landfill site currently receives municipal, commercial and industrial, and construction and demolition waste from Bungendore, Captains Flat and surrounds. It does not currently accept hazardous materials, but may have in the past. The landfill is unlined, overlying silty-clay soils, with no leachate collection system or monitoring system in place to identify groundwater or surface water contamination or landfill gas issues.

Annual waste inputs are below Environmental Protection Authority (EPA) licencing thresholds, although inputs have increased significantly in the past decade as a result of a significant increase in residential development in Bungendore. The site has been operational since the 1950s as a Council facility, and the site may also have been used prior to this period for waste disposal. The landfill has been staffed since at least 2000. The landfill is scheduled to cease operation in December 2014.

Following the closure of the landfill, the Resource Recovery Facility and Waste Transfer Station (RRF) will commence operation on the site. The RRF will accept waste of a similar nature as the landfill site, but will have a greater focus on resource recovery through the diversion of materials such as recyclables, household chemicals, greenwaste and other problem materials (for example mattresses and gas bottles) to reuse or recycling facilities. Residual waste will be loaded on to waste transport vehicles for disposal at a licensed landfill outside the Palerang local government area.

Although landfilling will not occur on the RRF site, site operations such as the loading of waste, heavy vehicle movements and waste compaction will result in the generation of

dust, noise and vibration. Windblown litter and odour issues may also be experienced periodically. Although site controls will be in place to minimise the above, incidents may occur that may result in complaints from neighbours if new residences are constructed in close proximity to the RRF.

Council has recently engaged a consultant to undertake a landfill closure plan for the Bungendore landfill. The project objectives are to:

- Establish a monitoring regime to meet the requirements of the NSW EPA *Environmental Guidelines: Solid Waste Landfills (1996)* and comply with the requirements of the *NSW Protection of the Environment Operations Act 1995*.
- Assess the risk to existing residential dwellings located within 500m of the landfill.
- Determine an appropriate buffer distance around the landfill site to guide future development.
- Develop a groundwater monitoring program to assess existing and future groundwater contamination.
- Develop a gas monitoring program to assess existing and future landfill gas generation rates and extents.
- Recommend, any remedial action to be undertaken to remove or reduce existing and future risk to groundwater and surrounding properties.

Although identified in the project objectives, risk to existing properties is expected to be low as the landfill has received relatively low annual waste volumes over its lifetime and waste capping was not carried out until recently, allowing landfill gas to escape as it was generated.

While an appropriate buffer distance to the RRF is not part of the landfill closure plan project, it is expected that the buffer to the landfill will be greater than that required for the RRF. It is anticipated that the closure plan will be complete by the end of 2015, although findings related to appropriate buffer distances may be available prior to this.

It is recommended that rezoning of the area potentially affected by the landfill (within the 500 metre radius) investigations be deferred until such time as suitable information to address the buffer and landfill gas issues is received.

The EPA is aware of the planning proposal and provided a response on 15 October 2013 to a request from and has been involved in the preparation of the landfill closure plan. It is also recommended that the planning proposal is referred to the EPA.

Social environment

At the time of the 2011 Population and Housing census, the town of Bungendore (UCL115035) had a population of 2,754 people. There was an average of 2.9 people per household. Based on this it is estimated that the proposed development would result in a population increase of approximately 900 people. Given this, it is suggested that the planning proposal and accompanying Council report is referred to the government agencies responsible for education, health, community infrastructure and services and emergency management.

Future land use and hard and soft infrastructure planning

It is proposed that Council undertake detailed planning in regard to land use and hard and soft infrastructure for Bungendore in 2015, this is outlined in another report to this meeting of Council.

Landuse planning

Bungendore Land Use Strategy and Structure Plan

The planning proposal comments on the *Bungendore Land Use Strategy and Structure Plan*, adopted by Council 5 August 2010 (pp 12-14). It is suggested that the planning proposal generally meets the document's vision, which are.

Vision

- Productive rural landscapes and a strong sense of rural living, and space, remain
- Village/townscape setting retains a country/heritage feel appealing to residents and visitors
- Rural entry roads retained (ie not dominated by housing)
- Friendly, safe community with good level of services and infrastructure
- Preservation and improvement/extension of Common and other green spaces to allow for walking, cycling, dog walking, horse riding etc
- Improved local employment and vitality and range of services in village but no large shopping centre
- Recognised for care of the natural environment and living sustainably

  (page i, *Bungendore Land Use Strategy and Structure Plan)*

In regard to amenity, the planning proposal on p14 states in relation to 'development of higher lands would impact on rural viewshed' that "Landscape treatment in the RE1 zone adjacent to the railway line and street tree planting could be investigated to mitigate impacts.". It is suggested that due to the slope that this treatment would have a minor impact. It is likely that two story dwellings will be erected in the proposed development, that these will be seen from the Kings Highway and that the development will intrude on the rural character of the area. The highest point on the lot is approximately 750 metres with the majority of the land adjacent to the railway (viewed from the Kings Highway) being between 700 and 730 metres. The Elmslea areas adjacent to the railway line are approximately 700-710 metres. Approaching Bungendore, parts of the highway are at a height of approximately 760 metres. However, the existing development can be seen from the highway and as Bungendore grows views of residential development will be one of the associated negative externalities.

As stated above, it is proposed that Council undertake detailed planning in regard to land use and hard and soft infrastructure for Bungendore in 2015.

Further studies in relation to the planning proposal

The aim of the planning proposal is to consider whether a project has merit early in the development stage and to avoid proponents undertaking costly studies in situations where it is viewed by those assessing the planning proposal that it does not have merit. As outlined above, a flora and fauna report was been prepared in 2010 and it is suggested that further flora and fauna assessment work should be undertaken in consultation with the NSW Office of Environment and Heritage.

In addition to this, it is also suggested that the following studies are undertaken in relation to:

- Soil testing to determine the suitability of the lot for residential use,
- Aboriginal cultural heritage,
- An assessment of land for contamination as required under clause 6, *State Environmental Planning Policy No.55 (Remediation of Land),*
- Bushfire,
- Assess available water under the licence using more appropriate water consumption data,
- A network analysis and report outlining the methods proposed (and ability) to provide potable water flows and water pressure to comply with service levels for the whole site (and possibly for the northern property),
- A network assessment and report outlining the methods proposed to connect to the sewerage reticulation system. Future growth needs to the north should be considered in this assessment,
- Options for the management of stormwater, and
- Traffic impact assessment.

Consultation on the planning proposal

Government agency consultation

It is suggested that prior to consultation with the community that the following government agencies are consulted with:

- NSW Office of Environment and Heritage
- Department of Environment (later in the process in regard to the areas of Natural Temperate Grassland)
- NSW Rural Fire Service
- NSW Roads and Maritime Services
- Transport for NSW
- NSW Office of Water
- NSW Environmental Protection Authority

- Fire and Rescue NSW
- NSW Department of Education and Communities
- NSW Police
- NSW Health
- Ambulance Service of NSW
- John Holland (railway infrastructure)
- NSW State Emergency Service

Community consultation

The planning proposal states that the consultation period will be 14 days (p19). It is suggested that the period should be 28 days as the proiposal is likely to generate significant local interest and it is not a minor amendment to the *Palerang Local Environmental Plan 2014.*

In addition to advertisements being placed in the newspapers, the notification of adjoining property owners and advice being placed on Council's website, it is suggested that a community meeting be conducted during the community consultation period.

Anticipated timeframes for the proposed rezoning

The table below provides indicative completion dates for the tasks associated with the proposed rezoning of the land.

task	*anticipated completion date*
Date of gateway determination	February 2015
Completion of technical information (required studies)	December 2015
Government agency consultation	March 2016
Consideration of submissions by Council	April 2016
Community consultation	June 2016
Consideration of submissions by Council	July 2016
Report to Council	early August 2016
Submission to the NSW Department of Planning and Environment	late August 2016
Amendment of the *Palerang Local Environmental Plan 2014*	December 2016

List of References

Econtext, 2012. *West Palerang Water Futures Report Series 2012 – Climate Variability in Western Palerang*.

Conclusion

As the planning proposal generally conforms with the strategic planning documents that apply to Bungendore it is recommended that planning proposal, council report and recommendations are referred to the NSW Minster for Planning and Environment for a gateway determination.

A Landuse Zoning Map has been prepared illustrating a recommended approach to the planning proposal. It is suggested that only the area outside of the 500 metre radius be considered in this planning proposal. However, as the proponent would like to develop the area within the 500 metre radius, the development of which is influenced by the outcome of the land fill studies, any environmental assessments should consider this area as well as the area outside of the radius.

Financial considerations

If the proposal is supported by Council and it receives a gateway determination that considers the proposal has merit, staff will be required to manage the consultation with government authorities, public exhibition and legislative process associated with preparing the local environmental plan.

The developer will be required to pay for the costs associated with the public exhibition such as advertisements in newspapers and public hearing and council staff time associated with progressing the planning proposal

Policy implications

As discussed above.

Social implications

As discussed above.

planning consultants

Planning Proposal for Land at Bungendore

To rezone land adjoining Elmslea, Bungendore for residential development

Prepared for: Elmslea Land Developments Pty Limited
Project No: 6129
Date: October 2014

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B. Site Plan superimposed on an aerial photo
C. Flora and Fauna Assessment, prepared by Kevin Mills & Associates, December 2010
D. Indicative Subdivision Layout
E. Proposed Zoning Map
F. Bungendore Strategy Opportunities and Constraints Plan and Structure Plan

1 Introduction

1.1 Commission

DFP Planning Pty Limited (DFP) has been commissioned by Elmslea Land Developments Pty Ltd (ELD) to prepare a Planning Proposal for land adjoining Elmslea Estate Bungendore to allow residential development.

A Planning Proposal submission dated September 2011 was prepared to assist Palerang Council (Council) in the preparation of a Planning Proposal to the Department of Planning and Infrastructure (DoPI). In August 2013, Palerang Council requested that an updated Planning Proposal be prepared in line with the most recent version of the Department of Planning and Infrastructure's *A Guide to Preparing Planning Proposals*. The Planning Proposal was updated and submitted to Council in September 2013 and referred to various State agencies for comment. The Environment Protection Authority (EPA) made comments regarding a 250m buffer from the waste transfer station and 500m buffer to the land fill site.

The land has been the subject of a number of studies. Parts of the site have already been identified as having potential for residential development in the Bungendore Land Use Strategy and Structure Plan, adopted by Council on 5 August 2010 and endorsed by the then Department of Planning on 30 November 2010.

ELD owns the entire area included in this Planning Proposal, together with a substantial area to the north of the subject site. ELD has completed development of the adjoining Elmslea Estate over the past several years.

This Planning Proposal has been prepared to satisfy the requirements of the Department of Planning's *A Guide to Preparing Planning Proposals* dated October 2012.

A Guide to Preparing Planning Proposals specifies that a Planning Proposal should comprise six parts as follows:

- **Part 1** – A statement of the objectives or intended outcomes of the proposed Local Environmental Plan (LEP).
- **Part 2** – An explanation of the provisions that are to be included in the proposed LEP.
- **Part 3** – Justification of the objectives, outcomes and provisions proposed in the LEP and the process for their implementation.
- **Part 4** – Maps, where relevant, to identify the intent of the Planning Proposal and the area to which it applies.
- **Part 5** – Details of the community consultation that is to be undertaken on a Planning Proposal.
- **Part 6** – The project timeline of a planning proposal.

Each of these parts will be addressed in this report.

1.2 Background

ELD has been pursuing rezoning of the site for many years and has undertaken a number of environmental investigations, which are summarised in Section 2.5. In 2006, ELD engaged GM Urban Design and Architecture to analyse the constraints and opportunities for Bungendore and to prepare a Structure Plan for Bungendore North, including the subject site.

In 2008, Council engaged P&A Walsh Pty Ltd to prepare a Land Use Strategy and Structure Plan for Bungendore (the Bungendore Strategy), which includes a "future

extension to residential development" within the subject lands. The matters raised in the Bungendore Strategy are addressed in Section 5.3.2.

Council has prepared a draft Local Environmental Plan (LEP) in line with the Standard Instrument. The draft Palerang LEP 2012 was placed on public exhibition until 8 March 2013. The new LEP, once published, will apply to all of Palerang and will replace the six plans that are currently in force.

As noted above, the EPA made comments in relation to a previous planning proposal on this site and specifically regarding a 250m buffer from the waste transfer station and 500m buffer to the land fill site. The land fill site is scheduled to close in December 2014. Council has sought fee proposals for the preparation of a land Closure Plan. The tender documentation issued by Council indicates that the land fill operations are programmed to be replaced by the waste transfer station on 1 December 2014. The project objectives will also include a range of monitoring programmes and advice on appropriate buffer distances around the land fill site to guide future development. The tender documents state that the monitoring programs will be in place for a minimum of 6 months following the landfill closure (i.e. about May/June 2015 at the earliest). The project scope also requires the consultant to prepare a risk assessment and recommend minimum buffer distance to guide new development surround the land fill site, and the minimum criteria for removal of the buffer. The Closure Plan will therefore contain information that can inform this planning proposal. The planning proposal includes all of the site (including land within the 250m and 500m buffer areas) but the final boundaries of the zone will be subject to the completion of the Closure Plan and its recommendations.

2 The Subject Site

The location of Bungendore in a regional context and its relationship to Queanbeyan and Canberra is illustrated in **Figure 1**.

The subject site comprises part of Lot I DP 798111. A copy of the DP is attached at **Appendix A**.

The subject site comprises 82.03 hectares of land immediately adjacent and to the north of Elmslea Estate as shown on **Figure 2**.

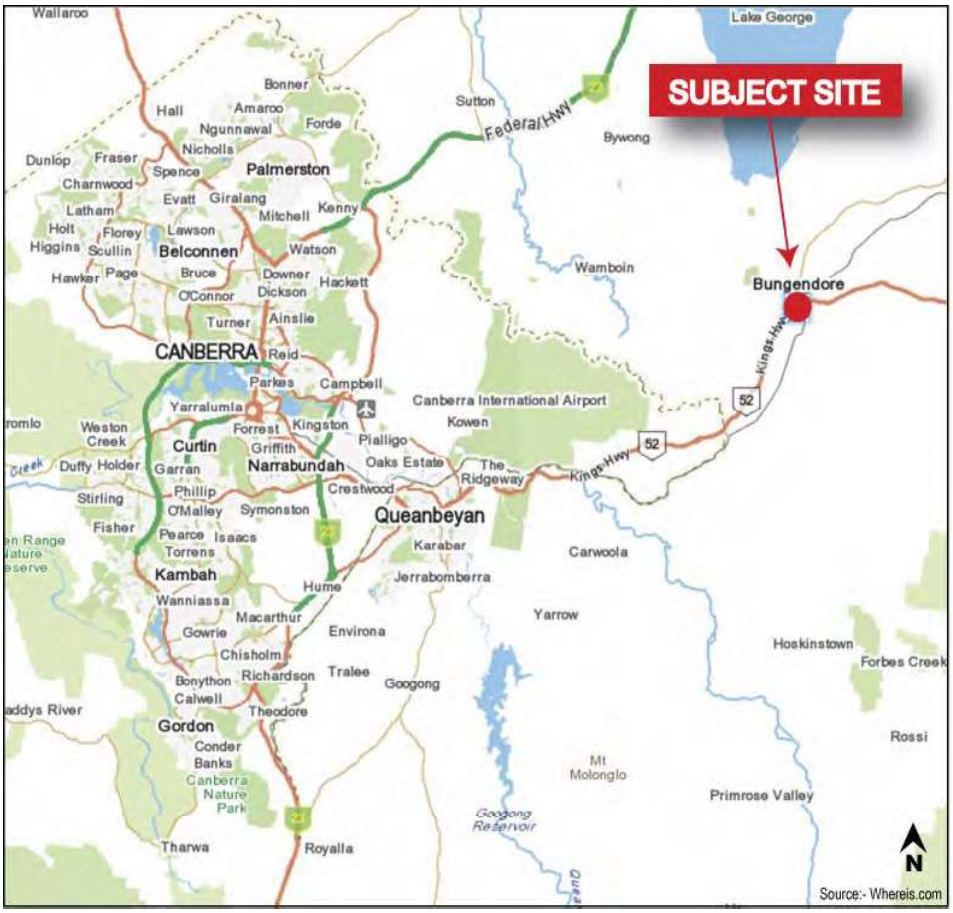


Figure 1 Locality Plan

Figure 2 shows the location of the site in relation to Bungendore and to Elmslea Estate.



Figure 2 Subject site

2.1 Site Area and Dimensions

The site area of the parent lot is 82.03 hectares with the following dimensions:

- Northern boundary of approximately 2,231 metres.
- Southern boundary of approximately 1,118 metres and 742 metres.
- Eastern boundary of approximately 753 metres.

- Western boundary to Tarago Road of approximately 320 metres.

Appendix B is a site plan superimposed on an aerial photograph (with contours) showing the above boundary dimensions.

2.2 Site Description

The topography varies from flat in the western parts of the site, to undulating and moderately sloping in the central and eastern areas.

There are no major water courses on the site although there are several gullies and depressions, all of which flow south towards Elmslea Estate, or under the railway to the east. There are several dams on the site.

The western boundary of the site is formed by Tarago Road, and the eastern boundary is defined by the railway line.

The site has been substantially cleared as a result of farming activities. Remaining trees include a wind break of pine trees around a small area in the south western part of the site and a row of trees along the boundary with the adjoining land fill, waste transfer station, the Tarago Road boundary and along parts of the boundary with Elmslea Estate.

There are no improvements or dwellings on the site.

2.3 Surrounding Area

East: The Goulburn to Canberra railway lies to the east of the site and beyond that lies open farm land.

North: The topography and vegetation of the subject site continues to the north except for the Bungendore land fill site and waste transfer station which adjoin the site near Tarago Road.

West: Tarago Road forms the western boundary of the site. Beyond Tarago Road there is a relatively small rural holding, which is adjoined to the south by a residential estate.

South: Elmslea Estate adjoins the site to the south and beyond that lies the village of Bungendore.

2.4 Existing Infrastructure

There is very little existing infrastructure servicing the subject site, although all services are available in Elmslea Estate immediately to the south. All services are readily available for extension into the site.

We are aware that a new water main is being constructed to connect a new bore and water treatment plant on Butmaroo Creek with the existing town. This pipeline will pass through the subject site alongside the railway line. An easement will need to be created to accommodate this new line.

There is a good range of shopping, community and recreational facilities located within Bungendore, approximately 2km to the south. Most residents of Bungendore travel to Queanbeyan or Canberra for major services. There is a primary school within the village.

Queanbeyan is approximately 26km by road from Bungendore and 40km by road from Canberra CBD.

2.5 Existing Studies

The following is a summary of the studies undertaken in relation to the site over the past several years.

- Rezoning Submission Elm Grove Bungendore: Don Fox Planning, October 2004

Included preliminary comments on a range of environmental issues and requested Council to resolve to proceed with a rezoning investigation.

- Preliminary Flora and Fauna Report Elmslea Second Stage, Bungendore: Kevin Mills & Associates, November 2004

  Found native grassland in the south east part of the site, but no other threatened species or communities. Grassland requires further investigation.

- Rezoning Submission Elm Grove & Chinnerys Bungendore: Don Fox Planning, December 2004

  Followed on from the October 2004 submission and included additional land to the north which Council was requested to include in the rezoning investigation.

- Bungendore Indicative Analysis and Structure Plan: GM Urban Design, March 2006

  Included detailed analysis of the constraints and opportunities for Bungendore and provided structure diagrams for Bungendore Village and Bungendore North (including the subject site).

- Elm Grove, Elmslea Bungendore Rezoning Submission and Concept Masterplan: Don Fox Planning, August 2007

  Included detailed analysis of the subject site and provided an indicative master plan featuring grid pattern street and a range of lot sizes.

- Flora and Fauna Assessment North Bungendore Palerang Council: Kevin Mills & Associates, December 2010 (Copy attached at **Appendix C**).

  Confirmed the previous assessment. The site is mostly covered in exotic grassland but with several small areas (< 1 hectare each) supporting native pasture or grassland. No other threatened species likely to be affected and no special habitat for threatened animals was identified.

3 Current zoning

The subject lands are currently zoned Rural 1(a) under Yarrowlumla LEP 2002.

4 The Proposal

ELD requests that the subject site be rezoned to permit residential development. An indicative layout and road hierarchy has been prepared which is attached at **Appendix D**. The indicative layout has informed the preparation of a zoning map which is attached at **Appendix E**. The zoning plan proposes:

- R2 – Low Density Residential zone for the majority of the site. The indicative layout is based on lot sizes ranging from 800 to 1200m^2 in the R2 zone.
- R5 – Large Lot Residential zone adjacent to the waste transfer station. This is based on lots of approximately 1ha in size.
- RE1 – Public Recreation for proposed open space.

The indicative layout yields approximately 309 lots (exclusive of the 500m radius from the land fill site). The final lot yield would be subject to more detailed planning at development application stage.

The key site constraints and opportunities (discussed throughout this report) and design principles that have guided the indicative layout and the corresponding zoning map are:

- A connector road running east-west being the higher order road connecting with Tarago Road. This will be the primary vehicle entry point into the residential subdivision. Local roads will feed off this collector road.

- A road pattern that integrates with Elmslea to the south. Three local roads are indicated to provide connectivity with Elmslea;
- Potential pedestrian or cyclist connections where roads in Elmslea will have an interface with Elm Grove;
- The road pattern has also been designed to allow for connections with land to the north, should that land be changed to a residential land use in the future (subject to further investigations);
- A grid pattern that reflects Elmslea and creates a permeable layout;
- East-west roads that generally follow contours with a layout that promotes north-south oriented lots to maximise solar access opportunities;
- North-south roads create permeability and also allow for drainage;
- Creation of open space corridors to reflect drainage lines where possible without over providing open space;
- An open space corridor to the east that forms a continuation of the open space network to the south and provides a buffer to the railway corridor. The landscape opportunities of this space can be further investigated to act as a transition and/or screen to rural viewshed;
- Areas of open space that incorporate two of three high conservation value native grasslands identified in the Flora and Fauna Assessment;
- Retention of windbreaks along the boundaries and at the Tarago Road frontage; and
- R5 – Large Lot Residential adjacent to the waste transfer station. The logical layout is to provide deep lots to allow for future dwellings to be located as the southern end of the lots, furthest from the boundary with the waste transfer station.

Height of building and Lot Size Maps can be prepared following Gateway Determination and for public exhibition. It is envisaged that an 8.5m height of building will apply across all land, consistent with Elmslea Estate to the south. Lot sizes will be between 800 –1200m^2 in the R2 zone and 1ha in the R5 zone, but can be finalised after Council has reviewed this planning proposal request.

4.1 Ownership

The subject site is single ownership ELD who has confirmed that it will proceed with development as quickly as practical. Development of the site will assist in meeting demand for detached housing in the area, which we understand is increasing following the completion of Elmslea Estate.

4.2 Servicing and infrastructure

Water management

In February 2007, Palerang Council wrote to the then Department of Natural Resources (DNR) regarding a proposal for increased water entitlement for Bungendore. The Council's requests involved several elements to increasing Bungendore's water supply involving the Currandooly bore (in the Butmaroo Creek aquifer) and the Turallo aquifer.

The DNR supported an interim arrangement comprising Turallo supplying 330ML per annum and Currandooly supplying 150ML per annum until June 2013 (i.e. a total of 480ML per annum).

The DNR supports in principle, water supply from Currandooly of 200ML per annum and Turallo of 322ML per annum, totalling 522ML per annum, subject to licensing and

preparation of an aquifer management plan. The important point to note is that the then DNR were not opposed to increasing water drawn from existing aquifers, subject to their management.

Pending preparation and approval of the management plan and licence application, the existing licence issued by the NSW Office of Water is limited to 472ML per annum.

Figure 3, on the following page**,** is a series of graphs representing water consumption and dwelling growth in Bungendore between 2001/02 and 2013/14, and demonstrates trends that are relevant to the planning proposal and associated increase in dwellings. The data has been sourced from Bungendore water flow data provided by Council.

The annual water consumption per dwelling/annum has reduced substantially from 472kl/dwelling/annum in 2001/2002 to about 250kl/dwelling/annum in 2013/2014. During this time period there have been water restrictions (introduced in November 2002 and relaxed in September 2010) and the water demand has reduced 45% whilst the number of dwellings has increased 90% since 2001/02.

The total water consumption for Bungendore has remained fairly constant since 2001/02, despite the increase in population, with a slight increase in the last 2 years. But the total water consumption of just under 300ML/annum (for all users) is well below the current water licence of 472ML/annum.

This reduced demand is most likely attributed, to a combination of water restrictions which have changed consumer behaviour, to community awareness of water efficiency as well as to sustainability measures such as new homes being more efficient in terms of water usage due to BASIX requirements, water tanks being installed for existing dwellings plus Council's Water Management Strategy for Bungendore (adopted April 2007).

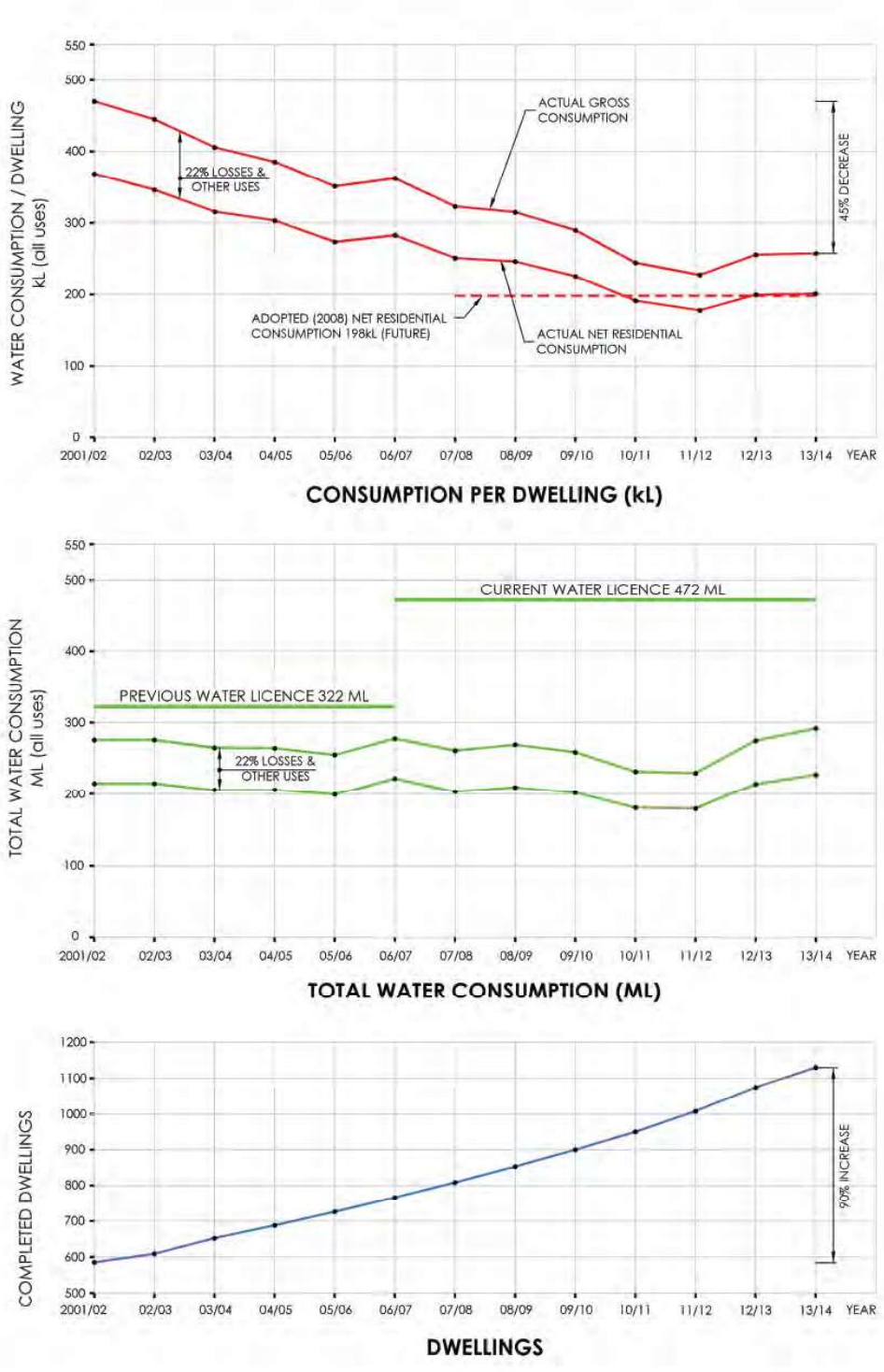


Figure 3 Bungendore Water Supply

Table 1 provides a summary of the possible dwelling yield within the existing zoned town boundaries (based on the Bungendore Strategy) and future capacity and the spare capacity if the existing zoned land is fully developed.

The Bungendore Strategy has adopted a water consumption of 198kL/dwelling/annum for new dwellings and 280.5kL/dwelling/annum for established areas. The difference is due to more water efficiency measures being incorporated into new dwellings through mandatory measures such as BASIX. For the purposes of the table below the above water consumption rates have been adopted.

Table 1 : Summary of potential new dwellings

	Dwellings	Water Consumption	Comment
Expected maximum dwelling yield within the existing zoned town boundaries	1500		As per the Bungendore Strategy
Existing dwellings	913	913x280.5kL/annum = 256ML/annum	As at July 2010 as per the Bungendore Strategy
Potential new dwellings **within** the existing zoned town boundaries[1]	587	587x198kL/annum = 116ML/annum	i.e. 1500-913 = 587 (includes existing Elmslea estate – built and vacant lot)
Total water consumption (existing and future)		372ML/annum	256+116
Remaining water available from current 472ML licence		100ML/annum	472-372
Potential new dwellings **outside** existing zoned town boundaries based on water demands	505 dwellings		Based on 198kL/annum (100ML/198kL)

***Note 1**: The existing zoned capacity might not be realised as many of these lots involve multiple ownerships and will be difficult and/or slow to develop. It could be expected that many will never be developed. The table has assumed 100% of the existing zoned capacity being developed.*

These figures do not take into account any further efficiency if existing dwellings plus non-residential uses adopt water sustainable initiatives. Future dwellings would be expected to exhibit water demand below the average rate with the implementation of BASIX and implementation of the Bungendore Water Management Strategy which adopts tougher BASIX controls for water usage.

The anticipated lot yield of approximately 309 lots could therefore be accommodated by current water licence that would allow for a further 505 dwellings outside land currently zoned for development.

If a growth rate of 5.5% is adopted (i.e. higher than forecast by the Department of Planning and Council – refer Section 5.3.2 of this report) then this would equate to approximately an additional 50 dwellings per year. If a split between new release and infill within the existing

residential zone of 70% / 30% is assumed, then 35 new greenfield lots would be added per year. Therefore it would take nearly 8 years for the proposed 309 lots to be taken up.

We note that DNR supports in principle an increase in water supply allowance subject to licensing and preparation of an aquifer management plan which would provide additional capacity, although this would not be required to be implemented immediately. As **Table 1** shows, a subdivision of the land proposed to be rezoned can be serviced by the existing licence, we expect that our approach is conservative but the above analysis demonstrates that there is more than sufficient time to put the management plan in place and to upgrade the water supply licence.

Access

Access is available from Tarago Road into the site, with secondary links to Bungendore through Elmslea Estate. The Tarago Road crossing of Turallo Creek, which is the main access into Bungendore from Elmslea Estate and the subject site has recently been upgraded.

Servicing / Infrastructure Delivery

At this stage, no detailed work has been done on servicing the new development, but all services are available within the adjoining Elmslea Estate and it is assumed they can be extended and augmented.

5 A Guide to Preparing Planning Proposals

5.1 Objectives or Intended Outcomes

The intended outcome of this Planning Proposal is to rezone the land to permit residential development. The objectives of the Planning Proposal are:

> *"• To provide for the housing needs of the community within a low density residential environment by making available additional residential land with lot sizes principally for detached housing, this being the predominant housing form in Bungendore.*
>
> *• To provide additional residential land to meet ongoing demand for new housing in Bungendore which the Bungendore Strategy notes has been steadily growing (refer to **Figure 3**).*
>
> *• To minimise impacts to the scenic quality of the area by locating new residential zoned land adjacent to the existing urban footprint.*
>
> *• To limit the area of the Planning Proposal to a size that can accommodate a lot yield that can reasonably be catered for by existing public services or public facilities or with limited augmentation.*
>
> *• To identify areas of the site suitable for open space to integrate with the existing open space network of Bungendore and form buffers at sensitive interfaces."*

The draft maps discussed in the Explanation of the Provisions demonstrate how these objectives are achieved.

5.2 Part 2 – Explanation of Provisions

A draft zoning map is provided at **Appendix E**. This has been prepared having regard to the pre-exhibition zoning map for draft Palerang LEP 2012 and the general layout (including underlying lot sizes) of the Indicative Layout Plan.

As noted earlier, Council has constructed a new water main to connect the new bore and water treatment plant on Butmaroo Creek with the existing town. The pipeline passes through the subject site alongside the railway line. Consequently, an SP2 – Infrastructure zone might be required. The extent of the RE1 – Public Recreation Zone or the need for an SP2 – Infrastructure Zone can be discussed with Council after the Gateway Determination.

5.3 Part 3 – Justification

This Planning Proposal recommends that the subject site should be rezoned to permit residential development. The following section demonstrates how such an outcome at Bungendore will satisfy the questions that the Department of Planning and Infrastructure applies to gateway determinations.

5.3.1 Need for the Planning Proposal

1. Is the Planning Proposal a result of any strategic study or report?

This Planning Proposal follows from the findings of the Land Use Strategy and Structure Plan prepared for Palerang Council by P&A Walsh Consulting Pty Ltd. The Structure Plan recommended that parts of the subject site are suitable for residential development "*subject to possible environmental offset investigations and water supply".* The Bungendore Strategy does not precisely indicate the boundary for future residential development, but rather indicates a future residential area with open space either side – that is, land which is nominated for urban purposes. This Planning Proposal covers land identified in the Bungendore Strategy as land having potential for urban purposes, and is therefore considered to be consistent with the Bungendore Strategy, subject to identifying the split between residential and any required open space/buffer.

As noted above the Bungendore Strategy is based on water consumption data from the Bungendore Strategy. The potential lot yield can be accommodated by the existing water supply. The Planning Proposal can therefore demonstrate consistency in terms of structure planning and water supply which is an important determining factor in the Bungendore Strategy.

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

A change of zoning is the only feasible way of permitting residential development on the subject site. Such a change of zoning may be achieved either in conjunction with the adoption of the new Palerang LEP, or by an amendment to the new LEP, but in either case, rezoning is necessary to permit the intended outcome.

5.3.2 Relationship to strategic planning framework

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

The Sydney Canberra Corridor Regional Strategy (SCCRS) was released in January 2007. The SCCRS looks at the needs of an area extending from Canberra in the south up to the southern highlands and examines the needs of the region in terms of housing, employment, transport, agriculture, resources and heritage.

Bungendore is identified as a Town:

> *"Small centres that vary in size. Small to medium concentrations of retail, health and other services with generally lower density housing. Reliant on higher order centres for specialised services, shopping and employment."*

The SCCRS indicates that an additional 14,200 dwellings will be required in the Southern region up to 2031 and further that the majority of new housing will be provided in Queanbeyan with the potential for limited expansion in Yass, Bungendore and Murrumbateman. The Fact Sheet for Palerang (July 2008) accompanying the SCCRS states that Palerang's anticipated population growth of approximately 5,000 people by 2031 can be accommodated in the existing vacant land within the LGA and limited expansion in Bungendore. The Planning Proposal is consistent with the approach of limited expansion in Bungendore.

The anticipated population growth is also confirmed in Council's Extraordinary Meeting No. 11 on 20 May 2010. This report outlines the Department of Planning's Population Forecasts to 2036. The average annual growth rates for the western part of Palerang (including Bungendore) are:

- 4% between 2001-2006
- 2.42% forecast for 2006-2011
- 1.65% forecast of 2031-2036

Council however notes that the growth rate in Bungendore is likely to be higher (as this is the town where most growth will occur) and Council has assumed an additional 1.4% above the average annual growth rates forecast by the Department. A growth rate from 3.82% in 2011 to 3.05% in 2036 is therefore forecast by Council. Clearly the Department and Council forecast a steady population growth for Palerang and the Regional and Local Strategies provide for some of this growth in Bungendore.

The SCCRS also says that "*the NSW Government will utilise locally available water supplies to support new residential development, particularly in Yass and Bungendore."*

The SCCRS also recognises that *"the availability of water will continue to be key driver and limiting factor on the amount and location of any additional urban development"*. The SCCRS notes this is relevant to Bungendore. Discussion on water supply is provided in **Section 4.2** which demonstrates that the existing water licence can service existing demands, residential demands predicted within the existing zoned lands as well as the additional lot yield anticipated as part of this Planning Proposal.

For the above reasons, the Planning Proposal is considered to be consistent with the regional strategy.

4. Is the planning proposal consistent with the local council's Community Strategic Plan, or other local strategic plan?

Bungendore Land Use Strategy and Structure Plan

Palerang Council prepared a Land Use Strategy and Structure Plan during 2008 and 2009. The Bungendore Strategy was adopted by Council on 5 August 2010 and according to Council's website (5 July 2011) was endorsed by the then Department of Planning on 30 November 2010. The Structure Plan is supported by an Opportunities and Constraints Plan a copy of which is provided at **Appendix F**. This plan nominates the site for "potential extension to residential redevelopment subject to environmental offset investigations". The environmental attributes of the land have been studied and areas of native grassland are retained in proposed open space. A copy of the Structure Plan is also attached at **Appendix F**. The Structure Plan also shows part of the subject site as a future extension to residential development subject to possible environmental constraints and water supply (discussed elsewhere in this submission).

This section comprises a discussion of the findings of the Bungendore Strategy and how they have been addressed. The Bungendore Strategy considered a number of rezoning requests that were before Council at the time the Bungendore Strategy was being prepared, including the subject site. Attachment A to the Bungendore Strategy identifies the advantages and disadvantages for each proposal. **Table 2** below reproduces the advantages and disadvantages for the subject site and provides appropriate comments.

Table 2 : Response to overview comments in Attachment A of the Bungendore Strategy	
Advantages	**Comment**
• Provides for logical contiguous extension to existing residential settlement and associated servicing efficiency	Agree
• Relative proximity to water supply line from Butmaroo	Agree
• Screening/filtering of views from major view lines (except on higher slopes)	Agree, noting that the indicative master plan provided for larger lots to mitigate the impact on views.
• Extension of existing development front would facilitate continuing economic development and the funding of new infrastructure	Agree
• Mixed density provides for housing mix	Agree
• Significant value-added to subject lands.	Agree
Disadvantages	
• Possible effect on high conservation value native grasslands	The Strategy notes that this is subject to field investigation. Kevin Mills & Associates (2010) has found that the site is mostly covered by exotic grasslands with several small areas (<1ha each) supporting poor quality native pasture. Kevin Mills & Associates has not found this to be an impediment and a matter than can be addressed at DA stage. The indicative subdivision layout and proposed zoning plan have been designed to retain patches of native grasses identified in the RE1 zones.
• Buffer needed to existing tip site (methane considerations) and proposed waste transfer station	In response to comments by the EPA a 500m buffer from the land fill site is provided, but should the findings of the Landfill Closure Plan (to be prepared by Council) nominate a lesser buffer, then the boundary of the R2 zone can be adjusted accordingly. The R5 large lot residential zone is utilised adjacent to the waste transfer station to allow for larger and deeper lots thereby enabling houses to be located further from the waste transfer station.

Table 2 : Response to overview comments in Attachment A of the Bungendore Strategy	
Advantages	**Comment**
• Steeper lands around knoll	The Opportunities and Constraints Plan (**Appendix F**) indicates steeper lands around a knoll on the edge of the site extending into adjoining land. The land on the southern slopes of the knoll have a grade of between 1:7 to 1:10 (14% to 10%) which are moderate and manageable for road gradients and larger lots (as proposed). The details of how to manage slope is a more detailed matter for development applications.
• Development of higher lands would impact on rural viewshed	The rural viewshed we believe relates to views from the Kings Highway as other viewing opportunities of the site (in a rural context) are constrained. The views are distant as the Kings Highway is between 1.5km to 2km from the eastern part of the site. Landscape treatment in the RE1 zone adjacent to the railway line and street tree planting could be investigated to mitigate impacts.
• Contains elements of class 3 agricultural lands according to DPI analysis	The land has been identified in the Bungendore Strategy for non-agricultural purposes (including open space and future residential) and not identified for agricultural purposes.

This Planning Proposal is based upon the indicative layout plan attached at **Appendix D**. The extent of this master plan layout corresponds, in part, with the area identified in the Bungendore Strategy, however we consider the comments in **Table 1** and commentary in **Section 5.3** justify the proposed residential zone boundary. Further, we can see no rationale for the shape of the area indicated for rezoning in the Strategy, whereas the area proposed for development within this Planning Proposal is based on an objective assessment of the opportunities and constraints.

5. Is the planning proposal consistent with applicable state environmental planning policies?

Environmental Planning Instrument	*Consistency*
SEPP 1 Development Standards	The Planning Proposal will be incorporated into the new Palerang LEP which will adopt the Standard Instrument and pursuant to compulsory Clause 1.9 SEPP 1 will not apply.
SEPP 14 Coastal Wetlands	Not applicable
SEPP 15 Rural Landsharing Communities	Not applicable
SEPP 19 Bushland in Urban Areas	Not applicable
SEPP 21 Caravan Parks	Not applicable
SEPP 26 Littoral Rainforests	Not applicable
SEPP 29 Western Sydney Recreation Area	Not applicable
SEPP 30 Intensive Agriculture	Not applicable

Environmental Planning Instrument	*Consistency*
SEPP 32 Urban Consolidation (Redevelopment of Urban Land)	Not applicable
SEPP 33 Hazardous and Offensive Development	Not applicable
SEPP 36 Manufactured Home Estates	Not applicable
SEPP 39 Spit Island Bird Habitat	Not applicable
SEPP 44 Koala Habitat Protection	Capable of consistency
SEPP 47 Moore Park Showground	Not applicable
SEPP 50 Canal Estate Development	Not applicable
SEPP 52 Farm Dams, Drought Relief and Other Works and Water Management Plan Areas	Not applicable
SEPP 55 Remediation of Land.	Subject to further investigations
SEPP 59 Central Western Sydney Economic and Employment Area	Not applicable
SEPP 62 Sustainable Aquaculture	Not applicable
SEPP 64 Advertising and Signage	Not applicable
SEPP 65 Design Quality of Residential Flat Development	Not applicable
SEPP 70 Affordable Housing (Revised Schemes)	The Planning Proposal will not contain provisions that would be inconsistent with, or hinder the application of the SEPP.
SEPP 71 Coastal Protection	Not applicable
SEPP (Affordable Rental Housing) 2009	Not applicable
SEPP (Building Sustainability Index: BASIX) 2004	Capable of consistency
SEPP (Exempt and Complying Development Codes) 2008	The Planning Proposal does not contain provisions that would be inconsistent with, or hinder the application of the SEPP.
SEPP (Housing for Seniors or People with a Disability) 2004	Capable of consistency
SEPP (Infrastructure) 2007	The Planning Proposal does not contain provisions that would be inconsistent with, or hinder the application of the SEPP.
SEPP (Kosciuszko National Park-Alpine Resorts) 2007	Not applicable
SEPP (Kurnell Peninsula) 1989	Not applicable
SEPP (Major Development) 2005	Not applicable
SEPP (Mining, Petroleum Production and Extractive Industries) 2007	Not applicable
SEPP (Penrith Lakes Scheme) 1989	Not applicable
SEPP (Port Botany and Port Kembla) 2013	Not applicable
SEPP (Rural Lands) 2008	The Planning Proposal is not considered to be inconsistent as the subject land has already been identified for future urban release within the Bungendore Strategy prepared for Palerang Council.

Environmental Planning Instrument	*Consistency*
SEPP (SEPP 53 Transitional Provisions) 2011	Not applicable
SEPP (State and Regional Development) 2011	Not applicable
SEPP (Sydney Drinking Water Catchment) 2011	Not applicable
SEPP (Sydney Region Growth Centres) 2006	Not applicable
SEPP (Three Ports) 2013	Not applicable
SEPP (Urban Renewal) 2010	Not applicable
SEPP (Western Sydney Employment Area) 2009	Not applicable
SEPP (Western Sydney Parklands) 2009	Not applicable

6. Is the planning proposal consistent with applicable Ministerial Directions (s.117 directions)?

Section 117 Direction	*Consistency*
1. Employment and Resources	
1.1 Business and Industrial Zones	Not applicable
1.2 Rural Zones	The Direction applies, however the subject land has been partly identified for future residential development in the endorsed Bungendore Land Use Strategy and Structure Plan. The proposal is considered to be consistent with the Direction.
1.3 Mining, Petroleum Production and Extractive Industries	The Direction applies, however the subject land has been partly identified for future residential development in the endorsed Bungendore Land Use Strategy and Structure Plan. The proposal is considered to be consistent with the Direction.
1.4 Oyster Aquaculture	Not applicable
1.5 Rural Lands	The Direction applies, however the subject land has been partly identified for future residential development in the endorsed Bungendore Land Use Strategy and Structure Plan. The proposal is considered to be consistent with the Direction.
2. Environment and Heritage	
2.1 Environment Protection Zones	Capable of consistency. Three small pockets of native grassland areas have been identified on site and two of those remnant pockets are retained in the RE1 zone.
2.2 Coastal Protection	Not applicable
2.3 Heritage Conservation	Capable of consistency, subject to further investigations.
2.4 Recreation Vehicle Areas	Capable of consistency

Section 117 Direction	*Consistency*
3. Housing, Infrastructure and Urban Development	
3.1 Residential Zones	The subject land has been identified for future urban release in the Bungendore Strategy and therefore proposed for future residential development. The Planning Proposal can incorporate appropriate provisions to ensure consistency with the Direction.
3.2 Caravan Parks and Manufactured Home Estates	Capable of consistency
3.3 Home Occupations	Capable of consistency
3.4 Integrating Land Use and Transport	Capable of consistency
3.5 Development Near Licensed Aerodromes	Not applicable
3.6 Shooting Ranges	Not applicable
4. Hazard and Risk	
4.1 Acid Sulfate Soils	The land is not mapped as having a probability of containing acid sulfate soils. Not applicable.
4.2 Mine Subsidence and Unstable Land	Not applicable
4.3 Flood Prone Land	Capable of consistency
4.4 Planning for Bushfire Protection	Capable of consistency
5. Regional Planning	
5.1 Implementation of Regional Strategies - Sydney Canberra Corridor Regional Strategy	The SCCRS only supports new settlements and housing in areas that are or will be identified in the final versions of the certain local strategies (once endorsed by the Director-General of the Department of Planning) including the Land Use Strategy and Structure Plan for Bungendore. The Planning Proposal is consistent with the Direction in this regard.
5.2 Sydney Drinking Water Catchments	Not applicable
5.3 Farmland of State and Regional Significance on the NSW Far North Coast	Not applicable
5.4 Commercial and Retail Development along the Pacific Highway, North Coast	Not applicable
5.5 Development in the vicinity of Ellalong, Paxton and Millfield (Cessnock LGA)	Revoked 18 June 2010
5.6 Sydney to Canberra Corridor	Revoked 10 July 2008. See Direction 5.1
5.7 Central Coast	Revoked 10 July 2008. See Direction 5.1
5.8 Second Sydney Airport: Badgerys Creek	Not applicable
5.9 North West Rail Link Corridor Strategy	Not applicable
6. Local Plan Making	
6.1 Approval and Referral Requirements	Capable of consistency
6.2 Reserving Land for Public Purposes	Capable of consistency
6.3 Site Specific Provisions	Not applicable

Section 117 Direction	*Consistency*
7. Metropolitan Planning	
7.1 Implementation of the Metropolitan Plan for Sydney 2036	Not applicable

5.3.3 Environmental, Social and Economic Impact

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

Much of the site has already been cleared and studies undertaken to date conclude that it appears to have little or no environmental value, except for relatively small areas of native grassland. Kevin Mills & Associates has undertaken further flora and fauna assessment including the native grasslands. A copy of the assessment is attached at **Appendix C**. Kevin Mills & Associates has assumed that the White Box – Yellow Box – Blakely's Red Gum Woodland endangered ecological community (EEC) is likely to have covered the upper parts of the study area, noting that the study area includes land outside the subject site. Under the Final Determination from the Scientific Committee, the grassland understory is still part of the endangered community even where the trees have been removed.

Kevin Mills & Associates has identified three areas of native grassland within the area proposed for development, all of which are less than 1ha in size and having site quality scores of one or zero – refer to **Appendix C** Table 1. They are not considered worthy of retention.

The areas worthy of retention are labelled NBUN04, 05 and 06. NBUN05 (adjacent to the railway corridor) and NBUN06 (adjacent to the southern boundary) are captured in the proposed RE1 zones.

NBUN03 is proposed to be zoned R2. Its retention in an open space area (or non-residential) zone does not make sense in terms of urban structure and potentially creates too many small areas of open space that would increase maintenance costs for Council when such lands are transferred.

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

Parts of Elm Grove outside the subject site have been identified as having high visual impact in the Bungendore Land Use Strategy and Structure Plan, 2010 and the Bungendore Indicative Analysis and Structure Plan, March 2006 prepared by GMU. The Bungendore Strategy identifies parts of the subject site as residential subject to further investigation and the remainder as open space expansion opportunities. The Bungendore Indicative Analysis and Structure Plan prepared by GMU notes that retaining areas of high visual exposure as open space would be untenable for Council given their size and associated maintenance costs. A residential zone is therefore proposed.

Small pockets of native grassland (as discussed in the response to Question 8) have also been identified and are retained where logical in the context of any urban structure and avoiding too many small pockets of open space which will increase maintenance costs for Council.

The land has also been identified as Class 3 Agricultural Land. However, the majority of land surrounding Bungendore is Class 3. Therefore if future residential demand is to be accommodated around Bungendore, there would need to be an acceptance that some Class 3 land would be required to achieve this objective. In this regard, the land has been identified in the Bungendore Strategy as future residential (subject to environmental

investigations) and potential open space. The subject site has not been identified to be retained for agricultural purposes in the Bungendore Strategy.

There is some risk from bush fires but this risk can be managed through appropriate design. Bush fire mapping has not been undertaken at this stage, and can be undertaken following the gateway determination. The results of such mapping would inform the preparation of bush fire maps to accompany the draft LEP.

The Bungendore Strategy identified the need for a buffer around the existing Council land fill and waste transfer station. We note that the land fill will shortly be decommissioned and replaced with the waste transfer station. The Landfill Closure Plan being prepared by Council can inform the Planning Proposal, and this constraint should not need to be the subject of a separate study.

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

The social and economic benefits of the proposal have been addressed in answer to Question 3.

There are no known items or places of European or Aboriginal heritage, and it is expected that these matters will be investigated once the gateway determination has been made.

5.3.4 State and Commonwealth Interests

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

The Planning Proposal will include provision of water supply and sewerage services. No investigations have yet been undertaken for electricity or telephone but it is expected that these services can readily be extended, given the proximity of the site to Elmslea Estate.

There is an existing primary school in Bungendore.

It is not likely that Bungendore will support major shopping and community facilities, even after the proposed development is completed.

The Planning Proposal and the RE1 zone along the eastern boundary will connect with the existing open space corridor adjacent to the railway line. The proposed RE1 zone will allow for the extension of the pedestrian and cycleway through the open space corridor.

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

Consultation with the relevant State and Commonwealth public authorities can be undertaken in conjunction with the exhibition of the Planning Proposal following the Gateway Determination.

5.4 Part 4 – Maps

A draft Zoning Map has been prepared and is attached at **Appendix E** which has been prepared having regard to the adjoining land zones of the existing Elmslea Estate immediately to the south as illustrated in the exhibited copy of the draft Palerang LEP 2012. Height of Building, Floor Space Ratio and Lot Size Maps can be prepared after Gateway Determination and again they can have regard to the building heights and FSR controls applying to the Elmslea Estate as contained in the draft Palerang LEP 2012.

5.5 Part 5 - Community Consultation

Public consultation will take place in accordance with the Gateway Determination when made and in accordance with Sections 56 & 57 of the *Environmental Planning and Assessment Act 1979*. This will involve notification of the Planning Proposal for a period of 14 days:

- On Palerang Council's website.

- Publication in local newspapers.
- Writing to adjoining landowners and relevant community groups in the immediate vicinity of the site.

5.6 Part 6 – Project Timeline

The Gateway Determination will set the time line for completion of the LEP which is typically 9 months from the week following the date of the Gateway Determination.

6 Conclusion

ELD owns a significant site which is identified in Palerang Council's Land Use Strategy and Structure Plan showing potential for residential development.

ELD requests that the subject site be rezoned to permit residential development. In order to support this Planning Proposal an indicative subdivision layout plan has been prepared for the site, based on detailed analysis of the constraints and opportunities.

This Planning Proposal has demonstrated that the proposal is consistent with the relevant strategies and is not inconsistent with applicable environmental planning instruments or Section 117 Directions.

The site is in a single ownership, providing opportunities for the implementation of a coordinated and comprehensive approach to planning and developing the site. Proceeding with a Planning Proposal and the residential zoning of the land will have the potential to deliver a number of community benefits as set out below:

- There is demand for detached housing in a rural village setting proximate to Queanbeyan and Canberra and this proposal will help to satisfy such demand;
- The proposal will satisfy a demand for greenfield lots, which will otherwise not be available in Bungendore;
- The proposal will provide additional population within Bungendore, thereby supporting retail and other services in the village;
- The proposal will reduce the pressure to redevelop lots within the existing village which could alter the character and ambience of the village;
- The new development can provide significant early funding for the new water supply and sewerage infrastructure and will assist in reducing Council's borrowing;
- The development will be based on a well thought out master plan. The community will benefit from the coordinated approach to the development and the consistent, efficient planning;
- The rezoned area will be an extension to the urban village and will not be an isolated community; and
- The development will result in increased economic activity, both during its construction and as its residents occupy their houses and contribute to activities in the village.

We therefore recommend that Council support the Planning Proposal. We would welcome the opportunity to further discuss this proposal with Council or the Department of Planning and Environment.

planning consultants

APPENDIX A

LT 2/55

PLAN OF THE LAND COMPRISED IN DEED

BK. 3754 NO. 706 CA. 35959

Locality: BUNGENDORE ~~Mun.~~ / Shire ~~City~~ YARROWLUMLA

Parish: CURRANDOOLEY County: MURRAY

Reduction Ratio 1: 15000 Lengths are in metres

D P 798111

Registered: M 16-2-1989

Title System: OLD SYSTEM

Purpose: LIMITED FOLIO CREATION

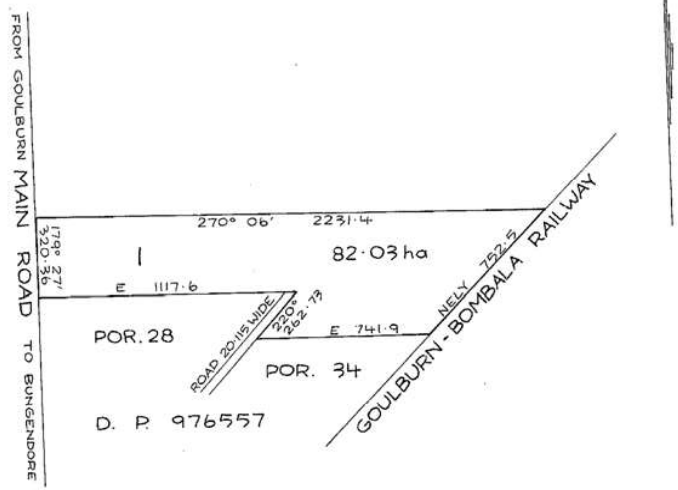
Ref Map: 8727-1-S

Last Plan: D. P. 976557

N O O I D I I D

THIS PLAN WAS PREPARED SOLELY TO IDENTIFY THE LAND IN THE ABOVE DEED AND THE BOUNDARIES HAVE NOT BEEN INVESTIGATED BY THE REGISTRAR GENERAL

THE PLAN IS NOT A CURRENT PLAN IN TERMS OF SEC. 327AA LOCAL GOVERNMENT ACT, 1919.



PLAN AMENDED IN LTO. 9.3.1989

AMENDMENTS AND/OR ADDITIONS MADE ON PLAN IN THE LAND TITLES OFFICE

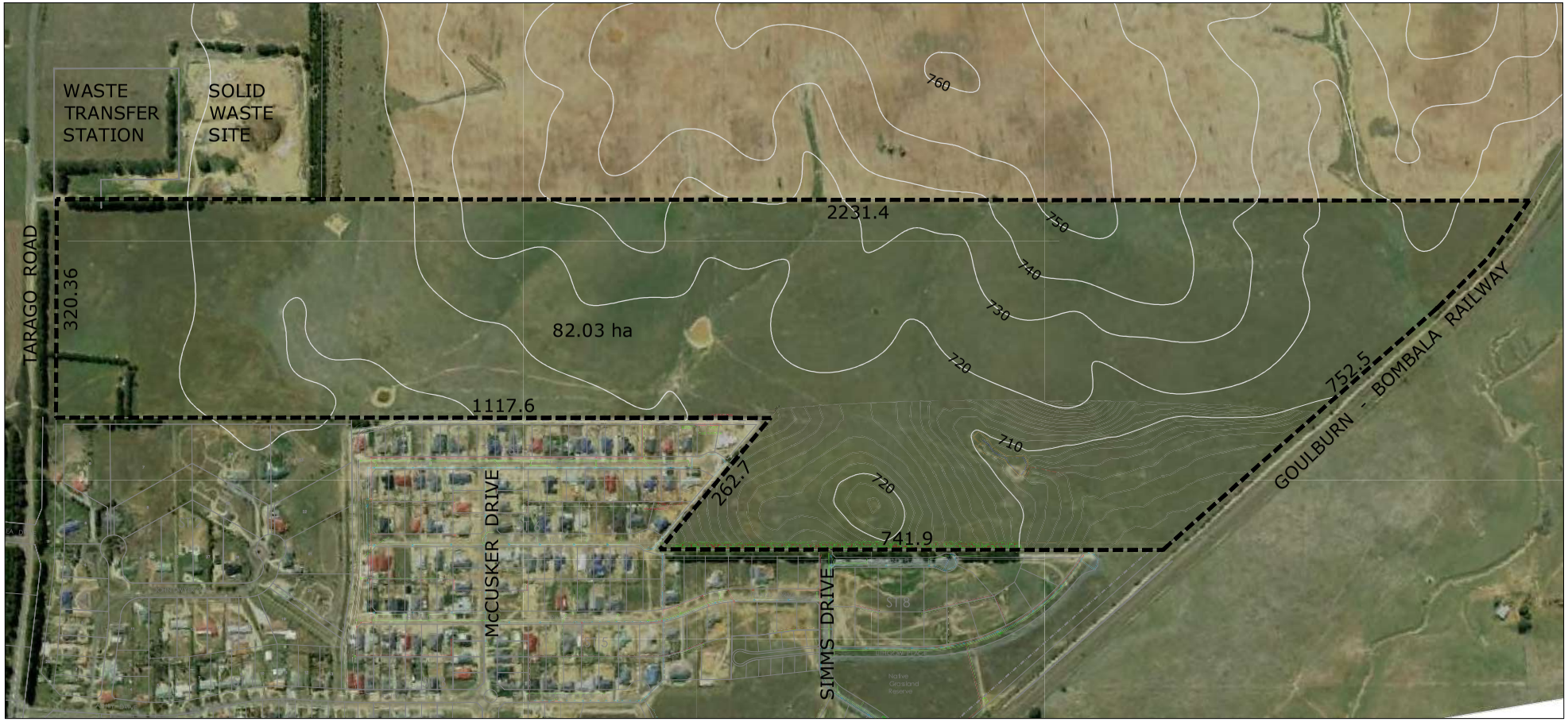
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Req:R422507 /Doc:DP 0798111 P /Rev:17-Aug-1992 /Sts:OK.OK /Prt:05-Jul-2011 15:59 /Pgs:ALL /Seq:1 of 1
Ref:Link Management Pty Ltd /Src:P

planning consultants

APPENDIX B



AMDT	DATE	DESCRIPTION
A	26/8/2013	FIRST ISSUE
B	18/9/2014	SECOND ISSUE

PROJECT MANAGER: LINK MANAGEMENT Pty Limited

0 50 100 150 200
SCALE 1:6,000 (A3)

CLIENT: ELMSLEA LAND DEVELOPMENTS PTY LTD

PLANNING CONSULTANT: DON FOX PLANNING

ELM GROVE PLANNING PROPOSAL
SITE PLAN

DRAWING No.L500 - SK1B

planning consultants

APPENDIX C

FLORA AND FAUNA ASSESSMENT
NORTH BUNGENDORE
PALERANG COUNCIL



a report prepared by

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December 2010
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Document Reference

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Cover Photograph: View of the eastern part of the study area. The exotic Scotch Thistle, shown in the foreground, is prominent across most of the study area; the land beyond the dam has recently been ploughed.

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This report was prepared for Don Fox Planning in accordance with their instructions. The report must only be used by the previously named and only for the stated purpose and not for any other purpose.

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FLORA AND FAUNA ASSESSMENT NORTH BUNGENDORE PALERANG COUNCIL

1 INTRODUCTION

This report was commissioned by Don Fox Planning of Pennant Hills on behalf of Elmslea Land Development Pty Limited, who are investigating a parcel of land on the northern side of Bungendore for its potential for residential subdivision. The location of the study area is shown on **Figure 1**.

The purpose of this study is to carry out a field investigation of the land, identify the presence of important flora and fauna features and comment on the conservation values of these features. At this stage there is no proposals for subdivision or other developments.

In particular, this report contains:
a. a description of the vegetation and fauna habitast in the study area;
b. lists of the plant and animals species observed;
c. an assessment of the potential presence of significant flora and fauna, including:
   - species, populations and communities listed under the New South Wales *Threatened Species Conservation Act 1995;*
   - matters of national environmental significance listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*; and
   - any other feature of importance.
d. a discussion of the potential for subdivision and the presence of important conservation areas for flora and fauna.

An inspection of the site was originally undertaken by Kevin Mills & Associates in November 2004, when a preliminary report was prepared (KMA 2004). Kevin Mills & Associates has also previously investigated the adjoining land on Elmslea Estate (KMA 2002). The current field survey was undertaken on 6 and 7 December 2010. Additionally, relevant information from the above two reports was used where relevant.

2 THE STUDY AREA

The study area is a large area of land adjoining the northern side of the existing Elmslea Estate, on the northern edge of the town of Bungendore in the Palerang local government area. The land, referred to here as the study area, is known as Lot 1 in DP 798111. The study area covers the area between Tarago Road in the west, the railway in the east and the Elmslea Estate to the south. To the north there is farmland, with the Cocunil tip in adjacent to the north-western corner of the land.

The land is undulating with no very steep slopes or ridges. Minor drainage lines cross the land, and there are four small farm dams. Altitude ranges from 700 metrers in the west to 750 metres in the eastern part of the land.

The underlying geology is metamorphosed Ordovician sediments on the higher eastern land, with rather deep old alluvial soils on some of the lower western parts of the land.

The land is grazing land, and has been for a long period of time. Most of the land has been pasture improved through seeding, fertilizing and probably ploughing in some places. The original vegetation was probably Yellow Box – Red Gum Woodland, with possibly some treeless natural temperate grassland on the lowest areas. There is very little native vegetation on the site today.

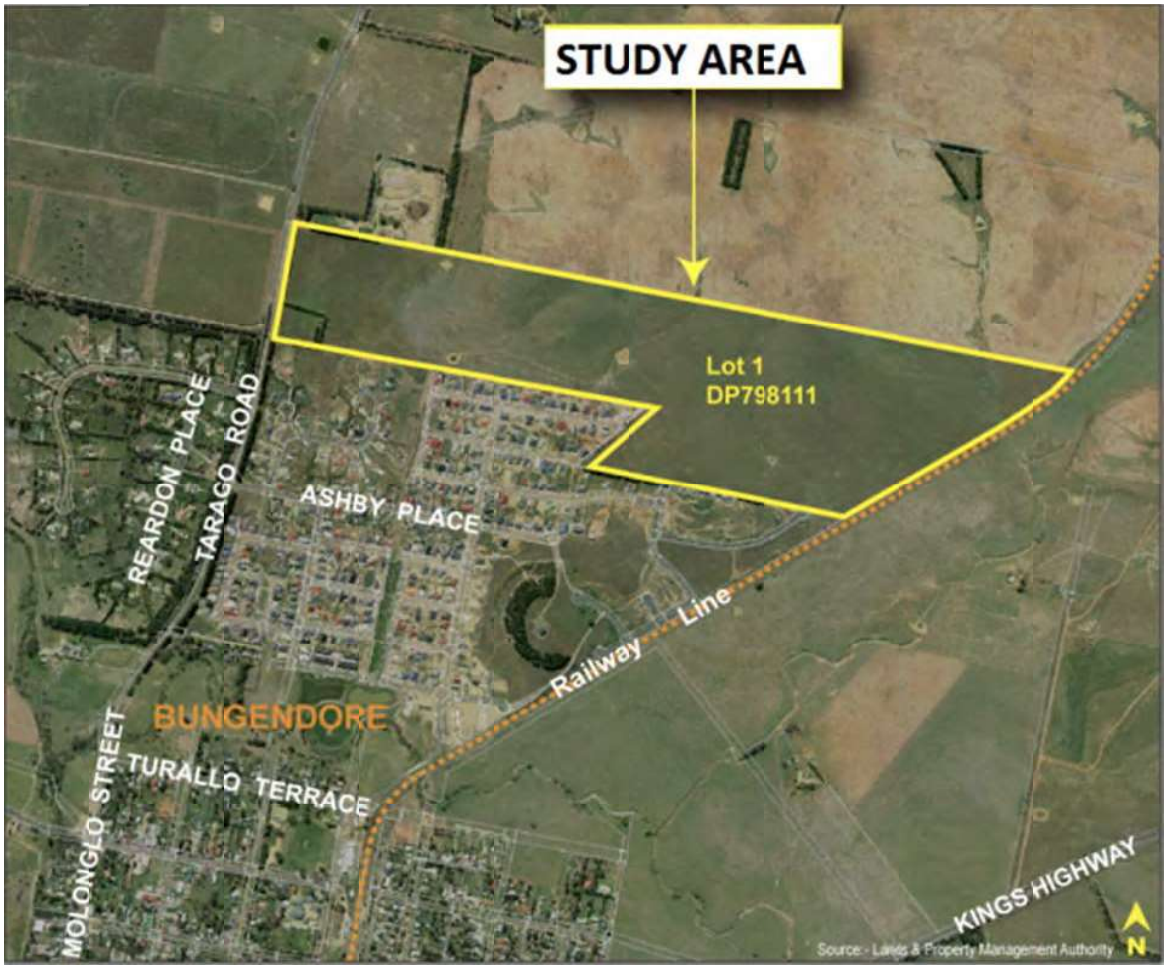


Figure 1. Location of the Study Area.

3 VEGETATION

The Survey

A previous preliminary vegetation survey was undertaken in the study area in November 2004, as part of a larger parcel of land extending to the north. The current survey was more intensive and included vegetation sampling (plant sampling plots). The purpose of this work is to obtain a detailed appreciation of the vegetation cover and to identify any special vegetation feature, such as rare plants and listed plant communities.

Plant sampling plots of 20 metres by 20 metres (400m^2) in size, the standard used in vegetation sampling, were temporarily established within vegetation considered to be fairly typical or representative of the area being sampled. More than one plant sampling plot was established if the community covered a large area, in which case the sites were selected to demonstrate variation within the community across its geographic spread. The plots are selected to avoid variations related to "edge effects" or caused by disturbance, e.g. from recent fires, clearing, erosion, etc. In the current case, plots were locarted in areas where native plants were abundant, even if involving only a single species.

A *pro forma* or standard survey sheet was completed for each plot to record the following information:

Plot data:	unique plot identification number
	date of survey
	plot size (usually 20m by 20m)
	plot location (name of location and GPS reading)
	land tenure
	landform, geology and soil type
	slope (gentle, moderate, steep, very steep)
	aspect (north, south etc)
	altitude (metres)
	whether a photograph was taken.
Floristic data:	height and proportional coverage (%) of each layer or stratum (tree canopy, middle storey, shrub understorey, ground cover)
	species present in each stratum (natives and exotics)
	abundance score for each species, as set out below
	if treeless, the closest natural tree species to the plot.

Floristic data for each species within each plot was gathered using a subjective abundance score from 1 to 6 based upon the following range of cover scores. Individual species with less than four individuals are noted.

1	<5% uncommon to rare	4	25% – 50% foliage cover
2	<5% common	5	50% - 75% foliage cover
3	5% - 25% foliage cover	6	75% -100% foliage cover.

Notes were made on the structure and condition of the vegetation. A general description of each community or "unit" was then prepared. The general description of

each plant community is based largely on the data collected during these plant sampling surveys.

Vegetation Classification

The vegetation communities in the study areas were classified on the basis of their structure and the dominant species in the tallest stratum, using the structural classification system devised by Walker and Hopkins (1990). Of most importance is the definitions of grassland types, which are based on the percentage of native species and their cover. The following definitions used in this report are widely accepted in the botanical literature; most of those relating to grasslands are from the report by Rehwinkel (1997).

Woodland: a community of well spaced trees (projective foliage cover 10-30%) growing to a height of 4 to 30 metres.

Open Woodland: a community of scattered trees (projective foliage cover <10% growing to a height of 4 to 30 metres.

Grassland: vegetation dominated by grasses and forbs, with <10% tree and/or shrub cover.

Native Grassland: grassland with >50% of vegetation cover composed of indigenous species, >50% of all species are native, and the minimum vegetation cover, alive or dead, is >10%.

Natural Grassland: native grassland considered to have had <10% tree and/or shrub cover at the time of European settlement.

Secondary Grassland: a native grassland remaining after the removal or dieback of previously occurring trees and/or shrubs, where these occupied >10% cover.

Native Pastures: containing native and introduced species, where introduced species occupy >50%, but <75% of both cover and species present, where pasture species have often been mechanically sown.

Exotic Grassland: where >75% of species and cover are composed of introduced plants.

Natural Temperate Grassland: a threatened grassland community listed under the Commonwealth *Environment Protection and Biodiversity Conservation* Act. The Recovery Plan for Natural Temperate Grassland (Environment ACT 2006) provides the following information:

> "The community is dominated by moderately tall (25-50cm) to tall (50cm – 1.0m), dense to open tussock grasses with up to 70% of the species being forbs. The community may be treeless or contain up to 10% cover of trees, shrubs or sedges. In the Southern Tablelands, Natural Temperate Grasslands are located at altitudes between 560 and 1200 metres in valleys influenced by cold air drainage and in broad plains. The community occurs within the geographical region of the Southern Tablelands of NSW and ACT, which extends southwards from the

Abercrombie River to the Victorian Border, from Boorowa and Jindabyne to the west and Goulburn to Braidwood and Bombala to the east."
"Natural Temperate Grassland is a native ecological community that is dominated by native species of perennial tussock grasses. The dominant grasses are *Themeda triandra* [*australis*], *Austrodanthonia* species, *Bothriochloa macra* and *Poa* species. The upper canopy stratum generally varies in height from mid-high (0.25-0.5m) to tall (0.5-1.0m). There is also a diversity of native herbaceous plants (forbs), which may comprise up to 70% of species present. The community is naturally treeless or has less than 10% projective foliage cover of trees or shrubs in its tallest stratum. The ecological community that makes up NTG-ST [Natural Temperate Grassland – Southern Tablelands] is defined by the vegetation structure thought to have been present at the time of European settlement."

Nomenclature
The plant species names in this report are the current names published by the National Herbarium of New South Wales in the *Flora of New South Wales* (Harden 1992-2002) and its online equivalent. Most of the common names are from the *Flora of New South Wales* (op. cit.), *Australian Plant Genera* by Baines (1981) and *Weeds of the South-east* by Richardson, Richardson and Shepherd (2006).

Vegetation Desrciption
As noted above, the original natural vegetation occurring on the land was removed many years ago. That vegetation locally was likely to have been natural temperate grassland, verging on Yellow Box – Red Gum Woodland. A map in the report by Fallding (2002) showing "modelled native vegetation pre-1750"shows the area around Bungendore as 'native grassland'. The vegetation on the land today consists almost entirely of exotic grassland. There are no natural indigenous trees on the land, although very old eucalypt stumps can be seen in a few places that indicate trees once grew there.

For descriptive purposes, the area is divided into four separate paddocks. Recent substantial rain has produced tall, lush and dense growth of grasses and forbs, often over 1.5 metres in height. This season is therefore an ideal time to undertake plant surveys.

The most western paddock, designated 1 on **Figure 2**, is primarily exotic grassland; the dominant species being Scotch Thistle *Onopordium acanthium*, Phalaris *Phalaris* sp., Fescue *Vulpia myuros*, Soft Brome *Bromus hordaceus*, Great Brome *Bromus diandrus*, Cocksfoot *Dactylis glomerata*, Barley Grass *Hordeum* sp., Oats *Avena* sp., Sorrel *Acetosella vulgaris*, and Flatweed *Hypochaeris radicata*.

Dense patches of Scotch Thistle *Onopordium acanthium* occur in the eastern half of the paddock. There are also areas of Speargrass *Austrostipa scabra*; although that native grass dominates, there are almost no other native species present (see survey plot NBUN01). Along the western and southern sides of the paddock, there are rows of planted Radiata Pine *Pinus radiata*, with a few Black Locust *Robinia pseudoacacia* and Elm *Ulmus* sp. trees; the latter species is suckering profusely in places. In the southwest corner, there is a square of planted trees of the same species, with the addition of a eucalypt.

To the east, paddock number 2 is dominated by Scotch Thistle *Onopordium acanthium*, Phalaris *Phalaris* sp., and the other exotics listed above. The slope in the northern-central part of the paddock supports native grassland; see survey plot NBUN02. This area appears to be a remnant of the original native grassland; the approximate extent of the area is shown on **Figure 2**.

Paddock 3 is almost entirely recently ploughed or poisoned with herbicide. These areas support exotic grassland containing the dominant local introduced species as listed above, or bare ground. Two sites were located that support native grassland, these areas were sampled at survey plots NBUN04 and NBUN05; see **Appendix 3**. The first is in the southern central part of the paddock, around survey plot NBUN04 and covers an area of about 60 metres by 70 metres, as determined by pacing. Plot NBUN04 contained a total of 34 native species; this is high for the study area but not when compared to high quality sites elsewhere in the region. The common species are Speargrass *Austrostipa bigeniculata,* Common Everlasting *Chrysocephalum apiculatum,* Australian Bindweed *Convolvulus erubescens,* Kidney Weed *Dichondra repens* and Hairy Panic *Panicum effusum.*

The second area of native grassland is in the extreme eastern corner of the paddock, around survey plot NBUN05. That site is about 100 metres by 50 metres in area, as measured from an aerial photograph. Except for the presence of Chilean Needle Grass *Nassella neesiana*, this area is of reasonable quality as native grassland. The common native species here are Speargrass *Austrostipa* spp., Common Everlasting *Chrysocephalum apiculatum,* Australian Bindweed *Convolvulus erubescens,* Variable Plaintain *Plantago varia* and Short Wallaby Grass *Austrodanthonia carphoides.*

Paddock 4, actually fenced with Paddock 3, is in the south-eastern part of the stuidy area abutting the existing subdivision to the south. The majority of the area is exotic grassland, with patches of Speargrasses *Austrostipa* spp. Abundant species are Scotch Thistle *Onopordium acanthium*, Fescue *Vulpia myuros*, Hairy Brassica *Hirschfeldia incana*, Rye Grass *Lolium* sp, Saffron Thistle *Carthamus lanatus* and smaller exotics such as Sheep Sorrel *Acetosella vulgaris*. One area of native grassland occurs on the highest part of the area, around survey plot NBUN06. That area of about 100 metres by 80 metres in size, as measured from an aerial photograph. The common native species here include Speargrass *Austrostipa bigeniculata,* Common Everlasting *Chrysocephalum apiculatum,* Hairy Panic *Panicum effusum* and Bluebells *Wahlenbergia* spp.

The four dams on the land support some fringing wetland plants, including the natives Hyssop Loosestrife *Lythrum hyssopifolia*, Rushes *Juncus* spp. and Water Couch *Paspalum distichum*.

Plant Sampling Results

To investigate the character and quality of the native grassland in the study area, six plant survey plots were temporarily established. The survey methods are described above. The resultant survey sheets are produced at **Appendix 3**. The locations of the six plant survey plots are shown on **Figure 2**. A summary of the results for each plot is provided in **Table 1**, in terms of the species recorded, a site quality score as developed by Rehwinkel (2007), and the type of grassland present.

Table 1
Summary of plant survey plots in the study area

Plot No.	*Location*	*Natives*	*Exotics*	*Site Quality Score*[1]	*Desidnated Grassland Type*
1	Paddock 1	4	16	0	Native pasture
2	Paddock 2	8	15	0	Native pasture
3	Paddock 2	5	15	1	Native pasture
4	Paddock 3	34	19	16	Native grassland
5	Paddock 3	25	15	10	Native grassland
6	Paddock 4	26	29	13	Native grassland

1. Based on Rehwinkel (2007).

The quality of the native grassland in the area is not high. Three plots produced scores to indicating "moderate to high floristic value" (Rehwinkel 2007). Rehwinkel also states that if a site "achieves a score of 4 or more, then it has values consistent with those defined for the Natural Temperate Grassland EEC", i.e. the Commonwealth EPBC Act listed grassland community. The presence of old eucalypt stumps may indicate that the higher parts of the land was originally a transition zone between treeless grassland (Natural Temperate Grassland) and Yellow Box – Red Gum Woodland.

Plant Species Recorded

Except for the very localised sites identified above, native species are quite uncommon in the study area. Most species are concentrated in these few sites or only found in these areas. In total 61 native species were recorded; many of these are rare on the study area. Also recorded were 64 exotic or introduced plant species. Complete lists of all plant species recorded in the survey appear at **Appendices 1 and 2**, where a list by family and **an** alphabetical list based on genus are provided. Some of the introduced species are declared noxious under the NSW *Noxious Weeds Act 1993*. Other introduced plants are widely regarded as environmental weeds; that is they threaten natural areas but are not listed noxious weeds in this LGA. The weeds in these categories located in the study area are listed in **Table 2**.

Table 2
List of noxious and environmental weeds

Species	*Common Name*	*Weed Control Class*[1]
Noxious Weeds		
Echium plantagineum	Paterson's Curse	4
Hypericum perforatum	St John's Wort	3
Lycium ferocissimum	African Boxthorn	4
Nassella neesiana	Chilean Needle Grass	4
Onopordium acanthium	Scotch Thistle	4
Rubus fruticosus sp. agg.	Blackberry	4
Environmental Weeds		
Carthamus lanatus	Saffron Thistle	
Chondrilla juncea	Skeleton Weed	
Crataegus monogyna	Hawthorn	

1. See Appendix 4 for weed control classes.

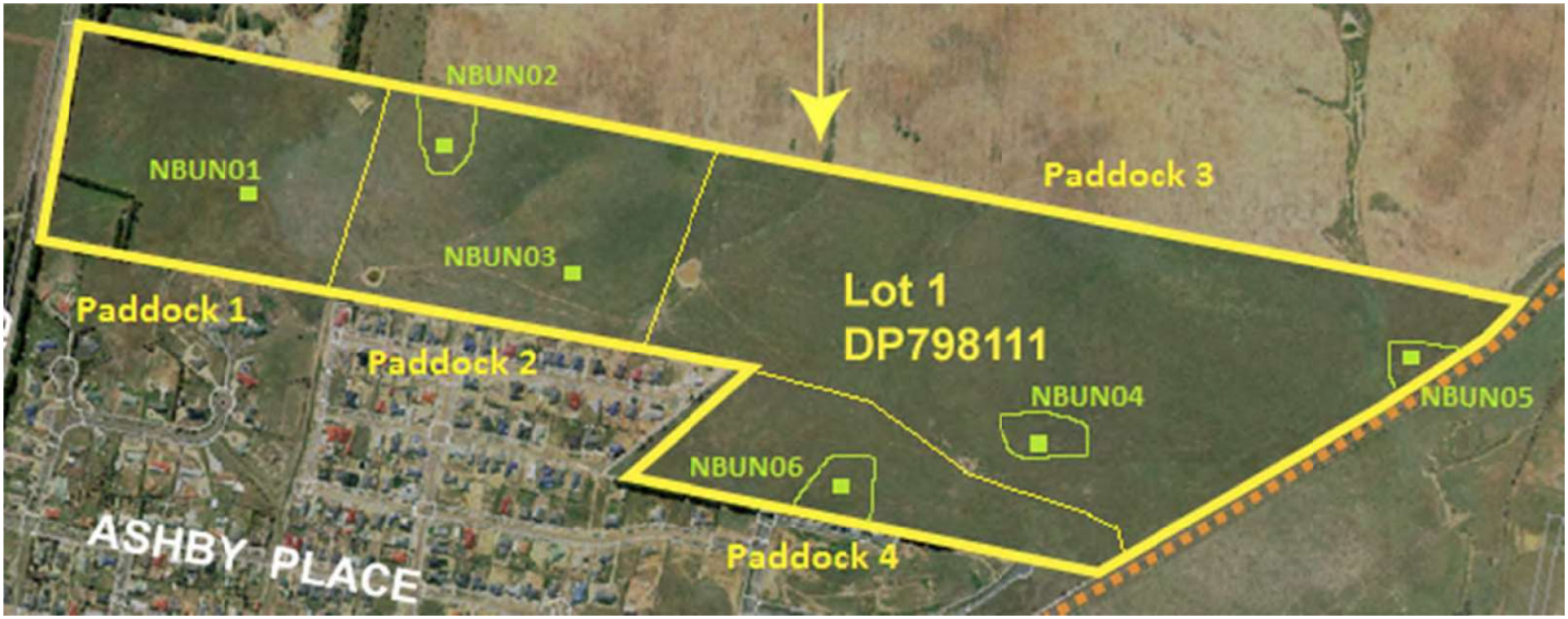


Figure 2. Vegetation Map of the Study Area.
Plant survey plots are numbered NBUN01 to NBUN06.
The areas of native grassland/native pasture indicated around four of the plots are general areas only and are not to scale.

4 FAUNA SPECIES AND HABITATS

Habitats Present
The habitat available for native fauna on the study area is primarily exotic grassland, with a planted copse of pines in one coner of the land. The small areas of native grassland are not likely to be significant to native fauna, because of their small size and because of their isolation from other areas of natural habitat. There are four small farm dams on the site, located in small, ephemeral drainage lines.

Animal Species Recorded
A list of the vertebrate animal species observed during the current study was prepared and is provided in **Appendix 5**. The appendix also lists those species found on the land and nearby in previous studies by Kevin Mills & Associates (2002; 2004). We have assessed the potential of the site to support threatened fauna in the following section.

5 ASSESSMENT OF CONSERVATION VALUES

5.1 THREATENED PLANTS

Threatened plant species are listed under the New South Wales *Threatened Species Conservation Act 1995* (TSC Act). The species are listed on schedules attached to the Act; these are continually being added to by the NSW Scientific Committee. Under the *Threatened Species Conservation Act*, threatened plant species are classified either as "critically endangered" (Schedule 1A, Part 1), "endangered" (Schedule 1, Part 1), "vulnerable" (Schedule 2) or "presumed extinct" (Schedule 1, Part 4).

Records of threatened plant species known to occur within 10 kilometres of Bungendore were sought from the NSW Wildlife Atlas; these are listed in **Table 3**. The table indicates the probability of each species occurring in the study area. Few threatened plant species have been recorded anywhere near Bungendore.

Table 3
Threatened Plant Species known to occur in the Bungendore Area

Species	TSC Act[1]	Potential to occur on the Site
Wilsonia rotundifolia Round-leaved Wilsonia	E	No suitable habitat present.
Eucalyptus aggregata Black Gum	V	No indigenous trees present.
Diuris aequalis Buttercup Doubeltail	E	No suitable habitat present.

1. E – endangered; V = vulnerable under the *Threatened Species Conservation Act 1995.*

The small, prostarte wetland plant Round-leaved Wilsonia *Wilsonia rotundifolia* occurs on Lake George, to the north of Bungendore. There is no suitable habitat in the study area for this species.

Black Gum *Eucalyptus aggregata* is a tree and clearly does not occur on the study area, where there are no indigenous trees at all.

The orchid Buttercup Doubletail *Diuris aequalis* occurs about 13 kilometres to the east of Bungendore. The habitats on the current study area totally exclude the presence of this species, as it is very unlikely to be present in these highly disturbed habitats.

No threatened plant species were located in the study area at North Bungendore; no species have previously been recorded near Bungnedore. Given the extensive modification to the natural vegetation and the long grazing history of the land, including pasture improvement, it is very unlikely that any of these plant species occur on the land.

5.2 THREATENED ANIMALS

Threatened animal species are listed under the *Threatened Species Conservation Act 1995*, where they are classified in the same manner as threatened plant species; see **Section 5.1**. Information on the distribution of threatened animal species in New South Wales can be found in the NSW Wildlife Atlas, maintained by the NSW National Parks and Wildlife Service (NPWS).

The Wildlife Atlas and other sources were scanned for records of threatened animals from the local area, within about 10 kilometres of Bungendore. Several threatened fauna species were found to have been recorded within 10 kilometres of the study area. These species are listed in **Table 4**. Notes in that table provide a summary assessment of the potential of each species to occur in the study area.

Table 4
Threatened animal species known to occur in the Bungendore Area

Species	TSC Act[1]	Potential to occur on the Site
Birds		
Speckled Warbler *Chthonicola sagittata*	V	Very unlikely. No woodland habitat is present.
Spotted Harrier *Circus assimilis*	V	Possible. A rather rare visitor to the region, may occur from time to time. No special habitat present.
Little Eagle *Hieraaetus morphnoides*	V	Possible. Thinly distributed in the region, probably occurs from time to time. No special habitat present.
Australasian Bittern *Botaurus poicilopticulus*	V	Very unlikely. There is no suitable habitat present. Recorded on Lake George.

Table 4 cont...
Threatened animal species known to occur in the Bungendore Area

Species	TSC Act[1]	Potential to occur on the Site
Diamond Firetail *Stagonopleura guttata*	V	Possible. Recorded in the general area. Probably occurs in the study area from time to time, although the habitat is marginal.
Freckled Duck *Stictonetta naevosa*	V	Very unlikely. The small dams do not provide suitable habitat. Recorded on Lake George and possibly the STP at Bungendore.
Gang-gang Cockatoo *Callocephalon fimbriatum*	V	Very unlikely. No forest or woodland habitat occurs in the study area.
Regent Honeyeater *Xanthomyza Phrygia*	CE	Very unlikely. No forest or woodland habitat occurs in the study area.
Varied Sittella *Daphoenositta chrysoptera*	V	Very unlikely. No forest or woodland habitat occurs in the study area.
Scarlet Robin *Petroica boodang*	V	Possible. Recorded in the general area. Probably occurs in the study area from time to time, although the habitat is marginal.
Flame Robin *Petroica phoenicea*	V	Possible. Recorded in the general area. Probably occurs in the study area from time to time, although the habitat is marginal.
Reptiles		
Little Whip Snake *Suta flagellum*	V	Recorded about 15 km northeast of Bungendore. Unlikely to occur on land as there is no natural habitat.
Frogs		
Green and Golden Bell Frog *Litoria aurea*	E	There is no habitat in the area for this frog.
Yellow-spotted Tree Frog *Litoria castanea*	CE	There is no habitat in the area for this frog.

1. CE – critically endangered; E – endangered; V = vulnerable, under the *Threatened Species Conservation Act 1995.*

It is concluded that the only threatened animal species likely to occur in the study area are those woodland species that range widely outside their breeding habitat, particularly in the cooler months. These species are the Diamond Firetail, Scarlet Robin, Flame Robin and Little Eagle.

5.3 ENDANGERED ECOLOGICAL COMMUNITIES

Endangered ecological communities are listed under the *Threatened Species Conservation Act 1995* (Schedule 1, Part 3). The Yellow Box – Red Gum Woodland community that

probably originally covered the upper parts of the study area, is listed as a part of the endangered ecological community complex known as White Box - Yellow Box - Blakely's Red Gum Woodland. Under the Final Determination from the NSW Scientific Committee, secondary grassland, that is grassland understorey where the trees have been removed, is still a part of the identified endangered community. Note that natural temperate grassland is not a listed endangered ecological community in New South Wales.

Grassland quality can be measurted using a combination of native pant diversity (number of species) and native cover. The number and abundance of exotic species is a secondary consideration. Rehwinkel (2007) provided a "quantitative method that enables the assessment of the relative values of sites containing any of the communities within the grassy ecosystems found in the Southern Tablelands of NSW".

The vast majority of the study area is exotic grassland where few native plant species are found. Except for Speargrasses *Austrostipa* spp. there are almost no native to be found in most aeas. Native pasture occurs in a few places, invariably dominated by Speargrass *Austrostipa* spp. with few other natives; see plant survey plots NBUN01 and NBUN03. These areas are mostly the result of colonisation by *Austrostipa* spp. into unmanaged padocks. In contrast, three areas in the east where there is a relatievly high number of native species are remnants of the original native grassland; see plant survey plots NBUN04, 05 and 06. The quality of the grassland elsewhere in the study area, as measured by the scheme developed by Rehwinkel (2007) and the relative native plant diversity compared to other sites in the region, is very low. Another consideration in terms of conservation value is the isolation of a site and its size. Small isolated areas of habitat are very difficult to manage to maitian their conservation values.

The only areas worthy of retention for flora and fauna values are the three areas of native grassland around plots NBUN04, 05 and 06, as shown on **Figure 2**. The remainder of the land has little to no conservation value for native biota.

A map provided to Cocunil by the DECCW shows much of the study area as "potential high vegetation conservation value". That map is based on satellite imagery with broad scale checking in the field. For individual sites, detailed ground surveys must be undertaken to determine the true status of the grassland and its conservation value. That exercise has been undertaken in this study. The result, as set out above, is that although there are a few small areas of native grassland, the vast maroity of the land has little to no conersvation value.

The only areas that we believe would satisfy the criteria of the above endangered woodland community are the four grassland areas shown on **Figure 2**. This grassland was described in **Section 4**. The remainder of the land does not meet the criteria of native grassland, even though some areas are dominated by the native Speargrasses *Austrostipa spp.*

5.4 ENDANGERED POPULATIONS

Endangered populations are listed under the TSC Act (Schedule 1, Part 2). No endangered populations have been declared in the Bungendore area.

5.5 CRITICAL HABITAT

Critical habitat refers only to those areas of land listed in the Registers of Critical Habitat. No critical habitat has been declared in the Bungendore area.

5.6 *ENVIRONMENT PROTECTION AND BIODIVERSITY CONSERVATION ACT*

The small areas of native grassland are Natural Temperate Grassland or White Box - Yellow Box - Blakely's Red Gum Woodland and Derived Grassland under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*. Any impact upon these areas would need to be assessed at the time of a development application.

6 CONCLUSION

This report has provided desciptions of the flora and fauna associated with a parcel of land on the northern edge of the town of Bungendore. A detailed study was undertaken of the grassland covering the land, with particular attention being given to identying native grassland and investigating its conservation value.

This investigation found that the study area is mostly covered in exotic grassland. Four sites were identified that support native grassland. Each site is quite small, less than one (1) hectare.

Threatened plant species are very unlikely to occur in the study area. There is no special habitat on the land for threatened animals. The only threatened fauna likely on the site are wandering woodland birds that are known from the general area and could visit the site from time to time.

If the land is to be developed, the identified native grassland sites should be assessed under the provisions of the NSW *Threatened Species Conservation Act 1995* and the Comonwealth *Environment Protection and Biodiversity Conservation Act 1999*. If any of these areas are found to be significant and to warrant retention, appropriate provisons should be made for their conservation in the long term.

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Appendix 1
Alphabetical List of Plant Species for the Bungendore Study Area

Native Species

Acaena ovina	Sheep's Burr
Alternanthera denticulata	Lesser Joyweed
Alternanthera sp. A	Joyweed
Asperula conferta	Common Woodruff
Austrodanthonia carphoides	Short Wallaby Grass
Austrodanthonia racemosa	Wallaby Grass
Austrodanthonia setacea	Small-flowered Wallaby Grass
Austrostipa bigeniculata	Tall Speargrass
Austrostipa scabra	Corkscrew
Bothriochloa macra	Red-leg Grass
Bulbine bulbosa	Bulbine Lily
Calocephalus citreus	Lemon Beautyheads
Chenopodium pumilio	Clammy Goosefoot
Chloris truncata	Windmill Grass
Chrysocephalum apiculatum	Common Everlasting
Convolvulus erubescens	Australian Bindweed
Crassula sieberiana	Stonecrop
Cymbonotus lawsonianus	Austral Bears-ear
Cynodon dactylon	Couch Grass
Cynoglossum suaveolens	Sweet Hound's Tongue
Desmodium varians	Slender Tick-trefoil
Dichondra repens	Kidney Weed
Dichopogon fimbriatus	Nodding Chocolate Lily
Eleocharis acuta	Common Spike-rush
Elymus scaber	Wheatgrass
Enneapogon nigricans	Nineawn Grass
Epilobium billardierianum	Willowherb
Erodium crinitum	Blue Heron's-bill
Eryngium rostratum	Blue Devil
Euchiton sphaericus	Cudweed
Glycine tabacina	Vanilla Glycine
Goodenia pinnatifida	Scrambled Eggs
Hypericum gramineum	Small St John's Wort
Juncus sp,	Rush
Leptorhynchos squamatus	Scaly Buttons
Lissanthe strigosa	Peach Heath
Lomandra bracteata	Mat-rush
Lomandra filiformis	Wattle Mat-rush
Lomandra multiflora	Many-flowered Mat-rush
Lythrum hyssopifolia	Hyssop Loosestrife
Microtis unifolia	Common Onion Orchid
Oxalis radicosa	Wood Sorrel
Panicum effusum	Hairy Panic
Paspalum distichum	Water Couch

Pimelea curviflora	Curved Rice-flower
Plantago varia	Variable Plantain
Poa sieberiana	Poa Tussock
Pseudognaphalium luteoalbum	Jersey Cudweed
Rumex brownii	Swamp Dock
Rumex dumosus	Wiry Dock
Senecio quadridentatus	Cotton Fireweed
Solenogyne dominii	Smooth Solenogyne
Themeda australis	Kangaroo Grass
Tricoryne elatior	Yellow Rush-lily
Velleia paradoxa	Spur Velleia
Vittadinia cuneata	Fuzzweed
Vittadinia gracilis	Woolly New Holland Daisy
Vittadinia muelleri	Narrow-leaf New Holland Daisy
Wahlenbergia communis	Tufted Bluebell
Wahlenbergia gracilis	Australian Bluebell
Wahlenbergia luteola	Yellowish Bluebell

Exotic Species

**Acetosella vulgaris*	Sheep Sorrel
**Aira elegantissima*	Delicate Hairgrass
**Amaranthus* sp.	Amaranth
**Anagallis arvensis*	Blue Pimpernel
**Arctotheca calendula*	Capeweed
**Avena* sp.	Oats
**Briza minor*	Lesser Quaking Grass
**Bromus cartharticus*	Prairie Grass
**Bromus diandrus*	Great Brome
**Bromus hordaceus*	Softr Brome
**Carthamus lanatus*	Saffron Thistle
**Centaurium erythraea*	Common Centaury
**Chenopodium album*	Fat Hen
**Chondrilla juncea*	Skeleton Weed
**Cirsium vulgare*	Spear Thistle
**Conyza* sp.	Fleabane
**Crataegus monogyna*	Hawthorn
**Cynosurus echinatus*	Rough Dog's-tail
**Dactylis glomerata*	Cocksfoot
**Echium plantagineum*	Paterson's Curse
**Eleusine tristachya*	Goose Grass
**Erodium botrys*	Long Stork's-nill
**Erodium cicutarium*	Common Stork's-bill
**Eucalyptus* sp.	Gum
**Gamochaeta americana*	American Cudweed
**Gamochaeta calviceps*	Cudweed
**Hirschfeldia incana*	Hairy Brassica
**Holcus lanatus*	Yorkshire Fog
**Hordeum* sp.	Barley Grasses

**Hypericum perforatum*	St John's Wort
**Hypochaeris radicata*	Flatweed
**Juncus bufonius*	Toad Rush
**Lactuca serriola*	Prickly Lettuce
**Lepidium* sp.	Peppercress
**Lolium* sp.	Ryegrass
**Lycium ferocissimum*	African Boxthorn
**Malva parviflora*	Small-flowered Mallow
**Modiola caroliniana*	Red-flowered Mallow
**Nassella neesiana*	Chilean Needle Grass
**Onopordium acanthium*	Scotch Thistle
**Parentucellia latifolia*	Common Bartsia
**Paronychia brasiliensis*	Chilean Whitlow Wort
**Pentaschistis airoides*	False Hairgrass
**Petrorhagia nanteuilii*	Proliferous Pink
**Phalaris* sp.	Phalaris
**Pinus radiata*	Radiata Pine
**Plantago lanceolata*	Ribbed Plantain
**Poa bulbosa*	Bulbous Bluegrass
**Polygonum aviculare*	Wireweed
**Prunus* sp.	Plum
**Robinia pseudoacacia*	Black Locust
**Rubus fruticosus* sp. agg.	Blackberry
**Solanum ? nigrum*	Black Nightshade
**Solanum triflorum*	Three-flowered Nightshade
**Sonchus asper* subsp. *glaucescens*	Prickly Sowthistle
**Sonchus oleraceus*	Common Sowthistle
**Spergularia rubra*	Sandspurry
**Trifolium arvense*	Haresfoot Clover
**Trifolium dubium*	Yellow Suckling Clover
**Trifolium glomeratum*	Clustered Clover
**Trifolium subterraneum*	Subterranean Clover
**Triticum aestivum*	Wheat
**Ulmus* sp.	Elm
**Urtica urens*	Small Nettle
**Verbascum virgatum*	Twiggy Mullein
** Vulpia myuros*	Fescue

Appendix 2
List of Plant Species by Family for the Bungendore Study Area

GYMNOSPERMAE (Conifers)

PINACEAE	
**Pinus radiata*	Radiata Pine

ANGIOSPERMAE (Flowering Plants)

AMARANTHACEAE	
Alternanthera denticulata	Lesser Joyweed
Alternanthera sp. A	Joyweed
**Amaranthus* sp.	Amaranth
AMYGDALACEAE	
**Prunus* sp.	Plum
ANTHERICACEAE	
Dichopogon fimbriatus	Nodding Chocolate Lily
Tricoryne elatior	Yellow Rush-lily
APIACEAE	
Eryngium rostratum	Blue Devil
ASPHODELACEAE	
Bulbine bulbosa	Bulbine Lily
ASTERACEAE	
Calocephalus citreus	Lemon Beautyheads
Chrysocephalum apiculatum	Common Everlasting
Cymbonotus lawsonianus	Austral Bears-ear
Euchiton sphaericus	Cudweed
Leptorhynchos squamatus	Scaly Buttons
Pseudognaphalium luteoalbum	Jersey Cudweed
Senecio quadridentatus	Cotton Fireweed
Solenogyne dominii	Smooth Solenogyne
Vittadinia cuneata	Fuzzweed
Vittadinia gracilis	Woolly New Holland Daisy
Vittadinia muelleri	Narrow-leaf New Holland Daisy
**Arctotheca calendula*	Capeweed
**Carthamus lanatus*	Saffron Thistle
**Chondrilla juncea*	Skeleton Weed
**Cirsium vulgare*	Spear Thistle
**Conyza* sp.	Fleabane
**Gamochaeta americana*	American Cudweed
**Gamochaeta calviceps*	Cudweed
**Hypochaeris radicata*	Flatweed
**Lactuca serriola*	Prickly Lettuce

**Onopordium acanthium*	Scotch Thistle
**Sonchus asper* subsp. *glaucescens*	Prickly Sowthistle
**Sonchus oleraceus*	Common Sowthistle
BORAGINACEAE	
Cynoglossum suaveolens	Sweet Hound's Tongue
**Echium plantagineum*	Paterson's Curse
BRASSICACEAE	
**Hirschfeldia incana*	Hairy Brassica
**Lepidium* sp.	Peppercress
CAMPANULACEAE	
Wahlenbergia communis	Tufted Bluebell
Wahlenbergia gracilis	Australian Bluebell
Wahlenbergia luteola	Yellowish Bluebell
CARYOPHYLLACEAE	
**Paronychia brasiliensis*	Chilean Whitlow Wort
**Petrorhagia nanteuilii*	Proliferous Pink
**Spergularia rubra*	Sandspurry
CHENOPODIACEAE	
Chenopodium pumilio	Clammy Goosefoot
**Chenopodium album*	Fat Hen
CLUSIACEAE	
Hypericum gramineum	Small St John's Wort
CONVOLVULACEAE	
Convolvulus erubescens	Australian Bindweed
Dichondra repens	Kidney Weed
CRASSULACEAE	
Crassula sieberiana	Stonecrop
CYPERACEAE	
Eleocharis acuta	Common Spike-rush
EPACRIDACEAE	
Lissanthe strigosa	Peach Heath
FABACEAE	
Faboideae (subfamily)	
Desmodium varians	Slender Tick-trefoil
Glycine tabacina	Vanilla Glycine
**Robinia pseudoacacia*	Black Locust
**Trifolium arvense*	Haresfoot Clover
**Trifolium campestre*	Hop Clover

**Trifolium glomeratum*	Clustered Clover
**Trifolium subterraneum*	Subterranean Clover
GENTIANACEAE	
**Centaurium erythraea*	Common Centaury
GERANIACEAE	
Erodium crinitum	Blue Heron's-bill
**Erodium botrys*	Long Stork's-bill
**Erodium cicutarium*	Common Stork's-bill
GOODENIACEAE	
Goodenia pinnatifida	Scrambled Eggs
Velleia paradoxa	Spur Velleia
HYPERICACEAE	
Hypericum gramineum	Small St John's Wort
**Hypericum perforatum*	St John's Wort
JUNCACEAE	
Juncus sp.	Rush
**Juncus bufonius*	Toad Rush
LOMANDRACEAE	
Lomandra bracteata	Mat-rush
Lomandra filiformis	Wattle Mat-rush
Lomandra multiflora	Many-flowered Mat-rush
LYTHRACEAE	
Lythrum hyssopifolia	Hyssop Loosestrife
MALVACEAE	
**Malva parviflora*	Small-flowered Mallow
**Modiola caroliniana*	Red-flowered Mallow
MYRTACEAE	
**Eucalyptus* sp.	Gum
ONAGRACEAE	
Epilobium billardierianum	Willowherb
ORCHIDACEAE	
Microtis unifolia	Common Onion Orchid
OXALIDACEAE	
Oxalis radicosa	Wood Sorrel

PLANTAGINACEAE	
Plantago varia	Variable Plantain
**Plantago lanceolata*	Ribbed plantain
POACEAE	
Austrodanthonia carphoides	Short Wallaby Grass
Austrodanthonia racemosa	Wallaby Grass
Austrodanthonia setacea	Small-flowred Wallaby Grass
Austrostipa bigeniculata	Tall Speargrass
Austrostipa scabra	Corkscrew
Bothriochloa macra	Red-leg Grass
Chloris truncata	Windmill Grass
Cynodon dactylon	Couch Grass
Elymus scaber	Wheatgrass
Enneapogon nigricans	Nineawn Grass
Panicum effusum	Hairy Panic
Paspalum distichum	Water Couch
Poa sieberiana	Poa Tussock
Themeda australis	Kangaroo Grass
**Aira elegantissima*	Delicate Hairgrass
**Avena* sp.	Oats
**Briza minor*	Lesser Quaking Grass
**Bromus cartharticus*	Prairie Grass
**Bromus diandrus*	Great Brome
**Bromus hordaceus*	Softr Brome
**Cynosurus echinatus*	Rough Dog's-tail
**Dactylis glomerata*	Cocksfoot
**Eleusine tristachya*	Goose Grass
**Holcus lanatus*	Yorkshire Fog
**Hordeum* sp.	Barley Grasses
**Lolium* sp.	Ryegrass
** Nassella neesiana*	Chilean Needle Grass
**Pentaschistis airoides*	False Hairgrass
**Phalaris* sp.	Phalaris
**Poa bulbosa*	Bulbous Bluegrass
**Triticum aestivum*	Wheat
** Vulpia myuros*	Fescue
POLYGONACEAE	
Rumex brownii	Swamp Dock
Rumex dumosus	Wiry Dock
**Acetosella vulgaris*	Sheep Sorrel
**Polygonum aviculare*	Wireweed
PRIMULACEAE	
**Anagallis arvensis*	Blue Pimpernel

ROSACEAE	
Acaena ovina	Sheep's Burr
**Crataegus monogyna*	Hawthorn
**Rubus fruticosus* sp. agg.	Blackberry
RUBIACEAE	
Asperula conferta	Common Woodruff
SCROPHULARIACEAE	
**Parentucellia latifolia*	Common Bartsia
**Verbascum virgatum*	Twiggy Mullein
SOLANACEAE	
**Solanum triflorum*	Three-flowered Nightshade
**Lycium ferocissimum*	African Boxthorn
**Solanum ? nigrum*	Black Nightshade
THYMELAEACEAE	
Pimelea curviflora	Curved Rice-flower
ULMACEAE	
**Ulmus* sp.	Elm
URTICACEAE	
**Urtica urens*	Small Nettle

Appendix 3
Plant Survey Sheets for the Study Area

Survey Sheet - Vegetation Plot		**Plot Size:** 20m x 20m **Kevin Mills & Associates**	
Site Name: North Bungendore		**Plot No.** NBUN01	**Photo:** yes
Location: Paddock 1 (far west).		**Recorder:** Kevin Mills	
Date: 07.11.10	**Community:** Native pasture.		
GPS(centre): 55 0722667 6097564 (WGS84)		**Soil:** Clayey and sandy.	
Land Tenure: Freehold	**Alt:** 705 m	**Geology:** Old alluvium.	
Slope: Gentle.	**Aspect:** South.	**Topography:** Lower slope.	
Species Cover: 1:<5% (uncommon); 2:<5% (common), 3:5-25%; 4:25-50%; 5:50-75%; 6:75-100%.			
Natives		**Exotics**	
Austrostipa scabra	6	*Acetosella vulgaris*	4
Crassula sieberiana	3	*Avena* sp.	1
Oxalis radicosa	1	*Bromus hordeaceus*	2
Pancum effusum	1	*Chondrilla juncea*	2
		Dactylis glomerata	2
		Hirschfeldia incana	1
		Hypocheiros radicata	2
		Lepidium sp.	1
		Onopordium acanthium	2
		Paronychia brasiliensis	2
		Pentaschistis airoides	3
		Poa bulbosa	1
		Spergularia rubra	1
		Trifolium arvense	2
		Trifolium glomeratum	3
		Vulpia myuros	5
Site quality score	**0**		
No. species	4	No. species	16
Cover	70%	Cover	90%



Photo of Plot NBUN01
Site dominated by Speragrass *Austrostipa scabra,* with very few other species.



Photo of Plot NBUN02
Site dominated by Speragrass *Austrostipa bigeniculata*; other natives are quire uncommon.

Survey Sheet - Vegetation Plot	**Plot Size:** 20m x 20m	**Kevin Mills & Associates**	
Site Name: North Bungendore		**Plot No.** NBUN02	**Photo:** yes
Location: Paddock 2 (central west).			**Recorder:** Kevin Mills
Date: 07.11.10	**Community:** Native grassland		
GPS(centre): 55 0722988 6097622 (WGS84)		**Soil:** Clayey, gravelly.	
Land Tenure: Freehold	**Alt:** 730 m	**Geology:** Ordovician metasediments.	
Slope: Moderate.	**Aspect:** West.	**Topography:** Upper slope.	
Species Cover: 1:<5% (uncommon); 2:<5% (common), 3:5-25%; 4:25-50%; 5:50-75%; 6:75-100%.			

Natives		**Exotics**	
Austrodanthonia setacea	1	*Acetosella vulgaris*	1
Austrostipa bigeniculata	6	*Bromus hordeaceus*	1
Austrostipa scabra	3	*Carthamus lanatus*	1
Convolvulus erubescens	1	*Conyza sp.*	1
Euchiton spaericus	1	*Dactylis glomerata*	3
Oxalis radicosa	1	*Gamochaeta calviceps*	1
Pancum effusum	1	*Hypocheiros radicata*	2
Rumex brownii	1	*Nassella neesiana*	1
		Pentaschistis airoides	1
		Phalaris sp.	1
		Poa bulbosa	1
		Sonchus asper	1
		Trifolium arvense	1
		Trifolium glomeratum	3
		Vulpia myuros	3
Site quality score	**0**		
No. species	8	No. species	15
Cover	95%	Cover	20%

Survey Sheet - Vegetation Plot	**Plot Size:** 20m x 20m **Kevin Mills & Associates**		
Site Name: North Bungendore		**Plot No.** NBUN03	**Photo:** yes
Location: Paddock 2 (south central).		**Recorder:** Kevin Mills	
Date: 07.11.10	**Community:** Native pasture		
GPS(centre): 55 0723151 6097451 (WGS84)		**Soil:** Clayey and sandy.	
Land Tenure: Freehold	**Alt:** 715 m	**Geology:** Ordovician metasediments.	
Slope: Moderate.	**Aspect:** Southwest	**Topography:** Mid-slope.	
Species Cover: 1:<5% (uncommon); 2:<5% (common), 3:5-25%; 4:25-50%; 5:50-75%; 6:75-100%.			

Natives		**Exotics**	
Austrodanthonia carphoides	1	*Acetosella vulgaris*	1
Austrodanthonia racemosa	1	*Arctotheca calendula*	1
Austrostipa bigeniculata	6	*Bromus hordeaceus*	1
Austrostipa scabra	2	*Carthamus lanatus*	2
Convolvulus erubescens	1	*Conyza sp.*	1
Euchiton spaericus	1	*Gamochaeta americana*	1
Lomandra filiformis	1	*Dactylis glomerata*	3
Oxalis radicosa	2	*Hypocheiros radicata*	1
		Lolium sp.	1
		Phalaris sp.	3
		Sonchus asper	1
		Trifolium arvense	1
		Trifolium glomeratum	3
		Vulpia myuros	4
		Pentaschistis airoides	2
Site quality score	**1**		
No. species	8	No. species	15
Cover	95%	Cover	50%



Photo of Plot NBUN03
Site dominated by Speragrasses, *Austrostipa bigeniculata* and *Austrostipa scabra*; few other natives are present.



Photo of Plot NBUN04
Relatively diverse native grassland.

Survey Sheet - Vegetation Plot	**Plot Size:** 20m x 20m	**Kevin Mills & Associates**
Site Name: North Bungendore	**Plot No.** NBUN04	**Photo:** yes
Location: Paddock 3 (south central).		**Recorder:** Kevin Mills
Date: 07.11.10	**Community:** Native grassland	
GPS(centre): 55 0723877 6097207 (WGS84)	**Soil:** Clayey.	
Land Tenure: Freehold **Alt:** 740 m	**Geology:** Ordovician metasediments.	
Slope: Moderate. **Aspect:** South	**Topography:** Upper slope.	

Species Cover: 1:<5% (uncommon); 2:<5% (common), 3:5-25%; 4:25-50%; 5:50-75%; 6:75-100%.

Natives		**Exotics**	
Acaena ovina	1	*Aira elegantissima*	2
Asperula conferta	1	*Briza minor*	2
Austrostipa bigeniculata	3	*Bromus hordeaceus*	3
Austrostipa scabra	2	*Centaurium erythraea*	2
Bothriochloa macra	1	*Cirsium vulgare*	1
Calocephalus citreus	1	*Conyza sp.*	1
Chrysocephalum apiculatum	4	*Gamochaeta americana*	1
Convolvulus erubescens	2	*Hypocheiros radicata*	2
Crassula sieberiana	2	*Lepidium sp.*	1
Cymbonotus lawsonianus	1	*Nassella neesiana*	2
Cynoglossum suaveolens	1	*Parentucellia latifolia*	2
Desmodium varians	1	*Pentaschistis airoides*	1
Dichondra repens	2	*Poa bulbosa*	1
Dichopogon fimbriatus	1	*Sonchus asper*	1
Elymus scaber	1	*Trifolium arvense*	1
Euchiton spaericus	1	*Trifolium campestre*	1
Glycine tabacina	1	*Trifolium glomeratum*	3
Hypericum gramineum	1	*Trifolium subterranean*	1
Leptorhynchos squamatus	1	*Vulpia myuros*	5
Lomandra filiformis	1		
Lomandra multiflora	1		
Lythrum hyssopifolia	1		
Microtis unifolia	1		
Oxalis radicosa	1		
Pancum effusum	2		
Plantago varia	1		
Poa sieberiana	1		
Rumex brownii	1		
Solenogyne dominii	2		
Themeda australis	1		
Vittadinia cuneata	1		
Vittadinia muelleri	1		
Wahlenbergia communis	1		
Wahlenbergia luteola	1		
Site quality score	**16**		
No. species	34	No. species	19
Cover	70%	Cover	70%

Survey Sheet - Vegetation Plot	**Plot Size:** 20m x 20m	**Kevin Mills & Associates**	
Site Name: North Bungendore		**Plot No.** NBUN05	**Photo:** yes
Location: Paddock 3 (extreme east).			**Recorder:** Kevin Mills
Date: 07.11.10	**Community:** Native grassland		
GPS(centre): 55 0724429 6097291 (WGS84)		**Soil:** Clayey.	
Land Tenure: Freehold	**Alt:** 710 m	**Geology:** Ordovician metasediments.	
Slope: Gentle.	**Aspect:** Southwest	**Topography:** Mid-slope.	
Species Cover: 1:<5% (uncommon); 2:<5% (common), 3:5-25%; 4:25-50%; 5:50-75%; 6:75-100%.			

Natives		**Exotics**	
Asperula conferta	1	*Bromus hordeaceus*	1
Austrodanthonia racemosa	1	*Acetosella vulgaris*	1
Austrodanthonia carphoides	3	*Cirsium vulgare*	1
Austrostipa bigeniculata	3	*Crataegus monogyna*	1
Austrostipa scabra	3	*Carthamus lanatus*	1
Bothriochloa macra	1	*Erodium cicutarium*	1
Calocephalus citreus	2	*Hypocheiros radicata*	1
Chrysocephalum apiculatum	4	*Nassella neesiana*	4
Convolvulus erubescens	2	*Onopordium acanthium*	1
Desmodium varians	1	*Petrorhagia nanteuilii*	1
Dichopogon fimbriatus	1	*Sonchus aspera*	1
Elymus scaber	1	*Trifolium arvense*	1
Enneapogon nigricans	1	*Trifolium glomeratum*	1
Leptorhynchos squamatus	1	*Vulpia myuros*	3
Lomandra filiformis	1		
Oxalis radicosa	1		
Pancum effusum	1		
Pimelea curviflora	1		
Plantago varia	2		
Poa sieberiana	1		
Rumex brownii	1		
Solenogyne dominii	1		
Themeda australis	1		
Velliea paradoxa	1		
Wahlenbergia luteola	1		
Site quality score	**10**		
No. species	25	No. species	14
Cover	90%	Cover	50%



Photo of Plot NBUN05
Relatively diverse native grassland;
the reddish grass is the noxious Chilean Needle Grass *Nassella neesiana*.



Photo of Plot NBUN06
Site dominated by Speargrass *Austrostipa bigeniculata*,
with a relatively high native species component.

Survey Sheet - Vegetation Plot	**Plot Size:** 20m x 20m	**Kevin Mills & Associates**	
Site Name: North Bungendore master		**Plot No.** NBUN06	**Photo:** yes
Location: Paddock 4 (high ridge).		**Recorder:** Kevin Mills	
Date: 07.11.10	**Community:** Native pasture.		
GPS(centre): 55 0723544 6097099 (WGS84)		**Soil:** Clayey.	
Land Tenure: Freehold	**Alt:** 725 m	**Geology:** Ordovician metasediments.	
Slope: Flat.	**Aspect:** North	**Topography:** Ridge crest.	
Species Cover: 1:<5% (uncommon); 2:<5% (common), 3:5-25%; 4:25-50%; 5:50-75%; 6:75-100%.			

Natives		**Exotics**	
Alternanthera sp. A	1	*Aira elegantissima*	1
Austrodanthonia carphoides	1	*Avena sp.*	1
Austrostipa bigeniculata	6	*Acetosella vulgaris*	3
Austrostipa scabra	3	*Bromus hordeaceus*	1
Calocephalus citreus	1	*Carthamus lanatus*	2
Chrysocephalum apiculatum	2	*Centaurium erythraea*	1
Convolvulus erubescens	1	*Chondrilla juncea*	1
Crassula sieberiana	1	*Cirsium vulgare*	1
Desmodium varians	1	*Conyza sp.*	2
Dichondra repens	1	*Gamochaeta americana*	1
Elymus scaber	1	*Gamochaeta calviceps*	1
Euchiton sphaericum	1	*Hirschfeldia incana*	1
Glycine tabacina	1	*Hordeum sp.*	1
Goodenia pinnatifida	1	*Hypocheiros radicata*	2
Lomandra ? bracteata	1	*Lactuca serriola*	1
Oxalis radicosa	2	*Lolium sp.*	2
Pancum effusum	2	*Nassella neesiana*	1
Plantago varia	1	*Onopordium acanthium*	1
Pseudognaphalium luteoalbum	1	*Paronychia brasiliensis*	1
Rumex brownii	1	*Pentaschistis airoides*	1
Senecio quadridentaus	1	*Petrorhagia nanteuilii*	1
Solenogyne dominii	1	*Phalaris* sp.	1
Tricoryne elatior	1	*Poa bulbosa*	1
Wahlenbergia communis	1	*Polygonum aviculare*	1
Wahlenbergia gracilis	2	*Sonchus aspera*	1
Wahlenbergia luteola	1	*Trifolium arvense*	1
		Trifolium glomeratum	1
		Triticum aestivum	1
		Vulpia myuros	3
Site quality score	**13**		
No. species	26	No. species	29
Cover	100%	Cover	40%

Appendix 4
Control Classes for Noxious Weed Species

(1) The following weed control classes may be applied to a plant by a weed control order:
(a) Class 1, State Prohibited Weeds,
(b) Class 2, Regionally Prohibited Weeds,
(c) Class 3, Regionally Controlled Weeds,
(d) Class 4, Locally Controlled Weeds,
(e) Class 5, Restricted Plants.

(2) The characteristics of each class are as follows:

(a) Class 1 noxious weeds are plants that pose a potentially serious threat to primary production or the environment and are not present in the State or are present only to a limited extent.

(b) Class 2 noxious weeds are plants that pose a potentially serious threat to primary production or the environment of a region to which the order applies and are not present in the region or are present only to a limited extent.

(c) Class 3 noxious weeds are plants that pose a serious threat to primary production or the environment of an area to which the order applies, are not widely distributed in the area and are likely to spread in the area or to another area.

(d) Class 4 noxious weeds are plants that pose a threat to primary production, the environment or human health, are widely distributed in an area to which the order applies and are likely to spread in the area or to another area.

(e) Class 5 noxious weeds are plants that are likely, by their sale or the sale of their seeds or movement within the State or an area of the State, to spread in the State or outside the State.

(3) A noxious weed that is classified as a Class 1, 2 or 5 noxious weed is referred to in this Act as a *notifiable weed*.

(4) Legal Requirements

Class 1. The plant must be eradicated from the land and the land must be kept free of the plant.
Class 2. The plant must be eradicated from the land and the land must be kept free of the plant.
Class 3. The plant must be fully and continuously suppressed and destroyed.
Class 4. The growth and spread of the plant must be controlled according to the measures specified in a management plan published by the local control authority.
Class 4*. The growth and spread of the plant must be controlled according to the measures specified in a management plan published by the local control authority an the plant may not be sold, propagated or knowingly distributed.
Class 5. The requirements in the *Noxious Weeds Act* for a notifiable weed must be complied with.

APPENDIX 5
List of Animal Species for the Bungendore Study Area

Group/Species		1[1]	2[2]
Mammals			
Brown Hare*	*Lepus capensis*	1	
Domestic Sheep*	*Ovis aries*		2
European Rabbit*	*Oryctolagus cuniculus*		2
Eastern Grey Kangaroo	*Macropus giganteus*	1	2
Birds			
Australasian Grebe	*Tachybaptus novaehollandiae*	1	
Australian Magpie	*Gymnorhina tibicen*	1	2
Australian Raven	*Corvus coronoides*	1	2
Australian White Ibis	*Threskiornis molucca*	1	2
Australian Wood Duck	*Chenonetta jubata*	1	2
Black-shouldered Kite	*Elanus axillaris*	1	
Brown Falcon	*Falco berigora*	1	
Brown Songlark	*Cincloramphus cruralis*	1	
Brown Thornbill	*Acanthiza pusilla*		2
Chestnut Teal	*Anas castanea*	1	
Common Blackbird*	*Turdus merula*	1	2
Common Starling*	*Sturnus vulgaris*	1	2
Crested Pigeon	*Ocyphaps lophotes*	1	2
Crimson Rosella	*Platycercus elegans*	1	
European Goldfinch*	*Carduelis carduelis*	1	
Galah	*Cacatua roseicapilla*	1	2
Golden-headed Cisticola	*Cisticola exilis*	1	
Grey Currawong	*Strepera versicolor*	1	
Grey Fantail	*Rhipidura fuliginosa*		2
Grey Shrike-thrush	*Colluricincla harmonica*	1	
Grey Teal	*Anas gracilis*	1	
Hardhead	*Aythya australis*	1	
House Sparrow*	*Passer domesticus*	1	2
Little Black Cormorant	*Phalacrocorax sulcirostris*	1	
Little Pied Cormorant	*Phalacrocorax melanoleucos*	1	
Magpie-lark	*Grallina cyanoleuca*	1	2
Nankeen Kestrel	*Falco cenchroides*		2
Pacific Black Duck	*Anas superciliosa*	1	
Pallid Cuckoo	*Cuculus pallidus*	1	
Pied Currawong	*Strepera graculina*	1	2
Red Wattlebird	*Anthochaera carunculata*	1	2
Red-rumped Parrot	*Psephotus haematonotus*		2
Richard's Pipit	*Anthus novaeseelandiae*	1	2
Silvereye	*Zosterops lateralis*	1	
Sulphur-crested Cockatoo	*Cacatua galerita*	1	2
Superb Fairy-wren	*Malurus cyaneus*	1	2
Welcome Swallow	*Hirundo neoxena*	1	2

White-faced Heron	*Egretta novaehollandiae*	1	
White-throated Needletail	*Hirundapus caudacutus*	1	
White-winged Chough	*Corcorax melanorhamphos*	1	
Willie Wagtail	*Rhipidura leucophrys*	1	2
Yellow Thornbill	*Acanthiza nana*		2
Yellow-rumped Thornbill	*Acanthiza chrysorrhoa*	1	2
Reptiles			
Three-toed Skink	*Hemiergis decresiensis*	1	
Frogs			
Spotted Grass Frog	*Limnodynastes tasmaniensis*		2
Froglet	*Crinia parinsignifera*		2

* Introduced species.
1. Recorded previously on and near the study area (Kevin Mills & Associates 2002; 2004)
2. Recorded on and near the study area in December 2010.

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APPENDIX D



Indicative Subdivision Layout

4 December 2014

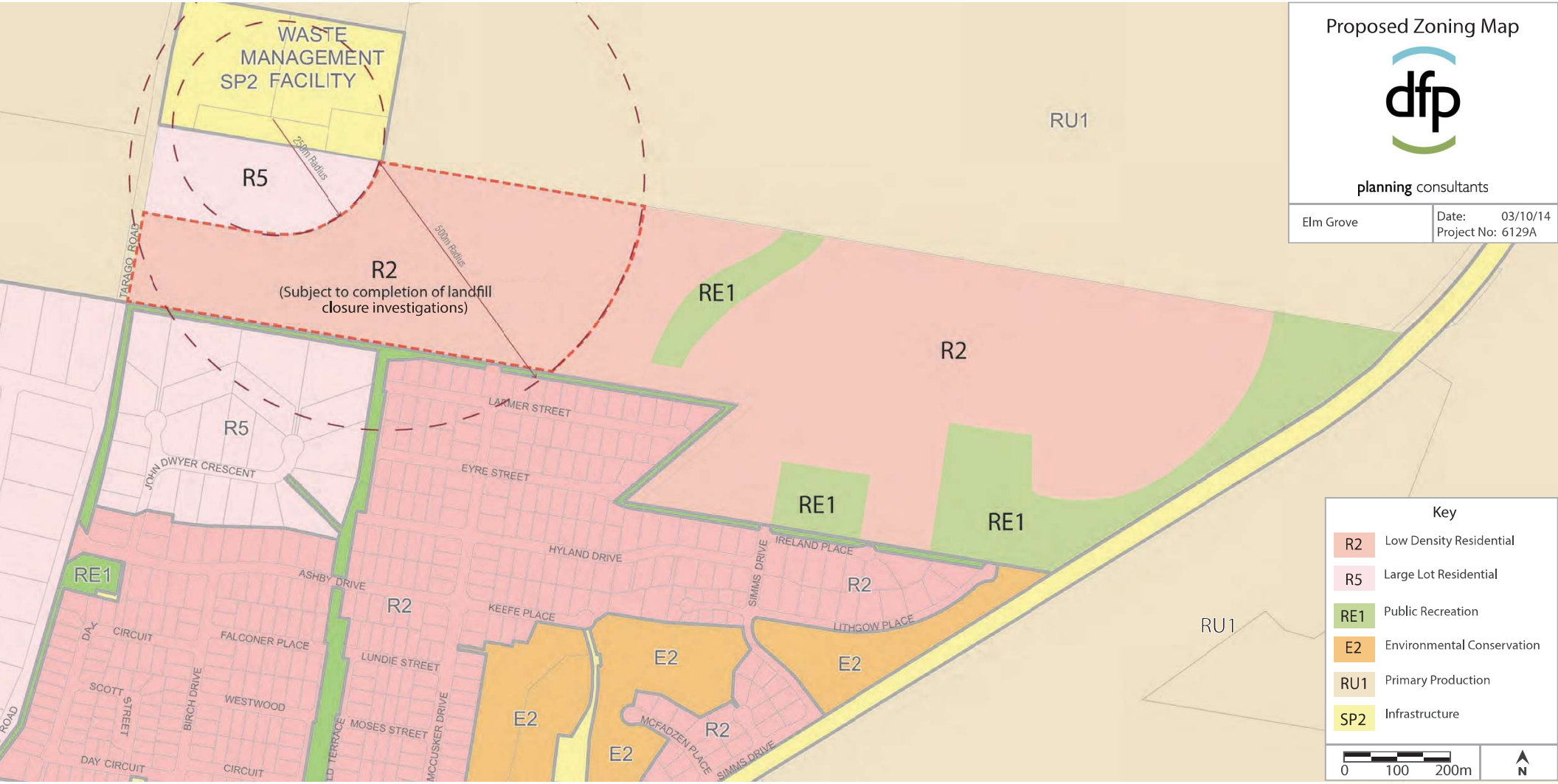
dfp

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Elm Grove	Date: 03/10/14 Project No: 6129A

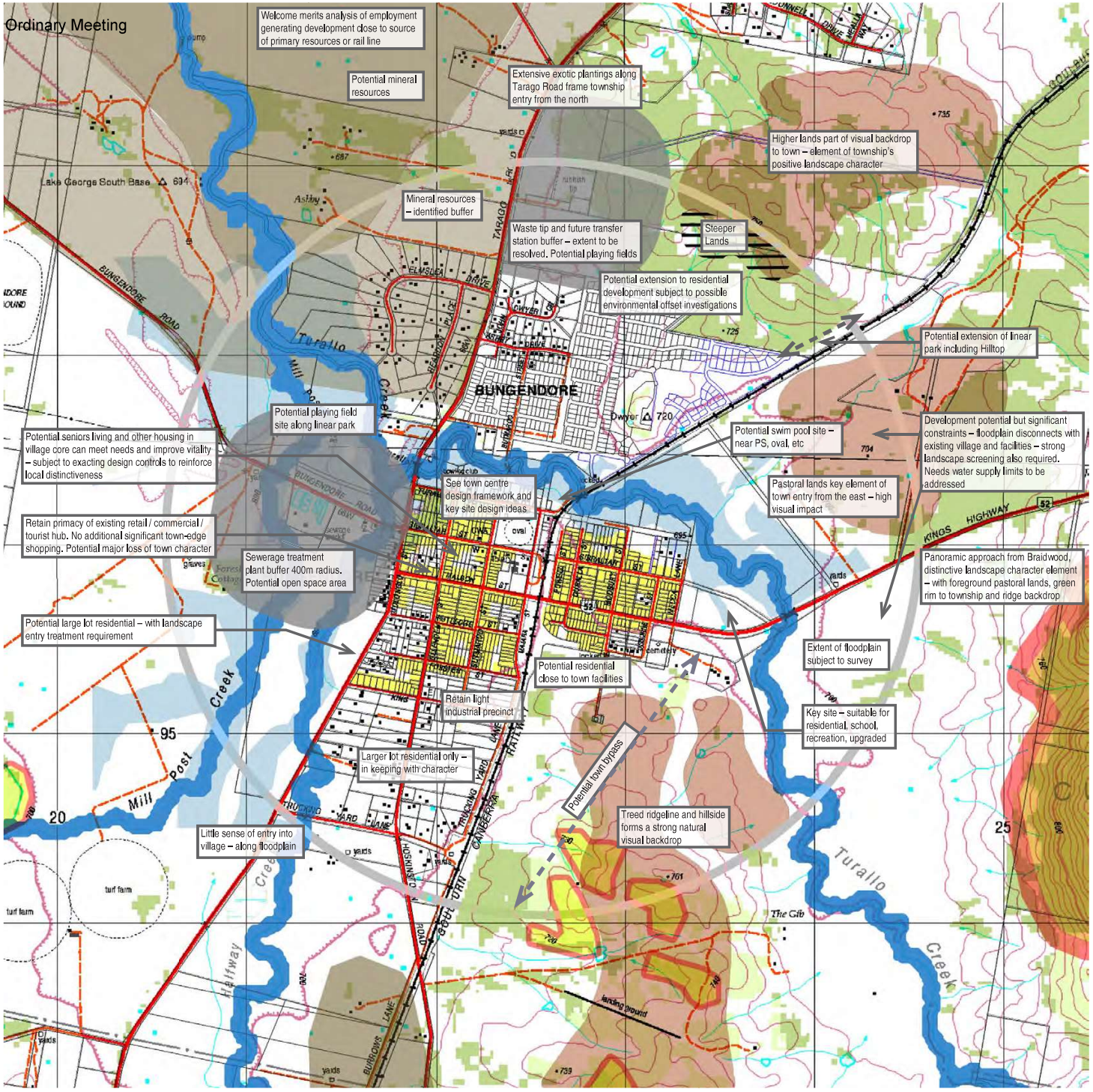
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APPENDIX E


WASTE MANAGEMENT SP2 FACILITY
250m Radius
500m Radius
R5
R2
(Subject to completion of landfill closure investigations)
RU1
RE1
R2
R5
LARMER STREET
JOHN DWYER CRESCENT
EYRE STREET
RE1
RE1
HYLAND DRIVE
IRELAND PLACE
SIMMS DRIVE
R2
RE1
ASHBY DRIVE
R2
KEEFE PLACE
LITHGOW PLACE
RU1
DAY CIRCUIT
FALCONER PLACE
LUNDIE STREET
E2
E2
SCOTT STREET
BIRCH DRIVE
WESTWOOD
MOSES STREET
MCCUSKER DRIVE
E2
MCFADZEN PLACE
R2
SIMMS DRIVE
E2
DAY CIRCUIT
CIRCUIT
Proposed Zoning Map
dfp
planning consultants
Elm Grove
Date: 03/10/14
Project No: 6129A
Key
R2 Low Density Residential
R5 Large Lot Residential
RE1 Public Recreation
E2 Environmental Conservation
RU1 Primary Production
SP2 Infrastructure
0 100 200m
N

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APPENDIX F



Bungendore

Land Use Strategy & Structure Plan

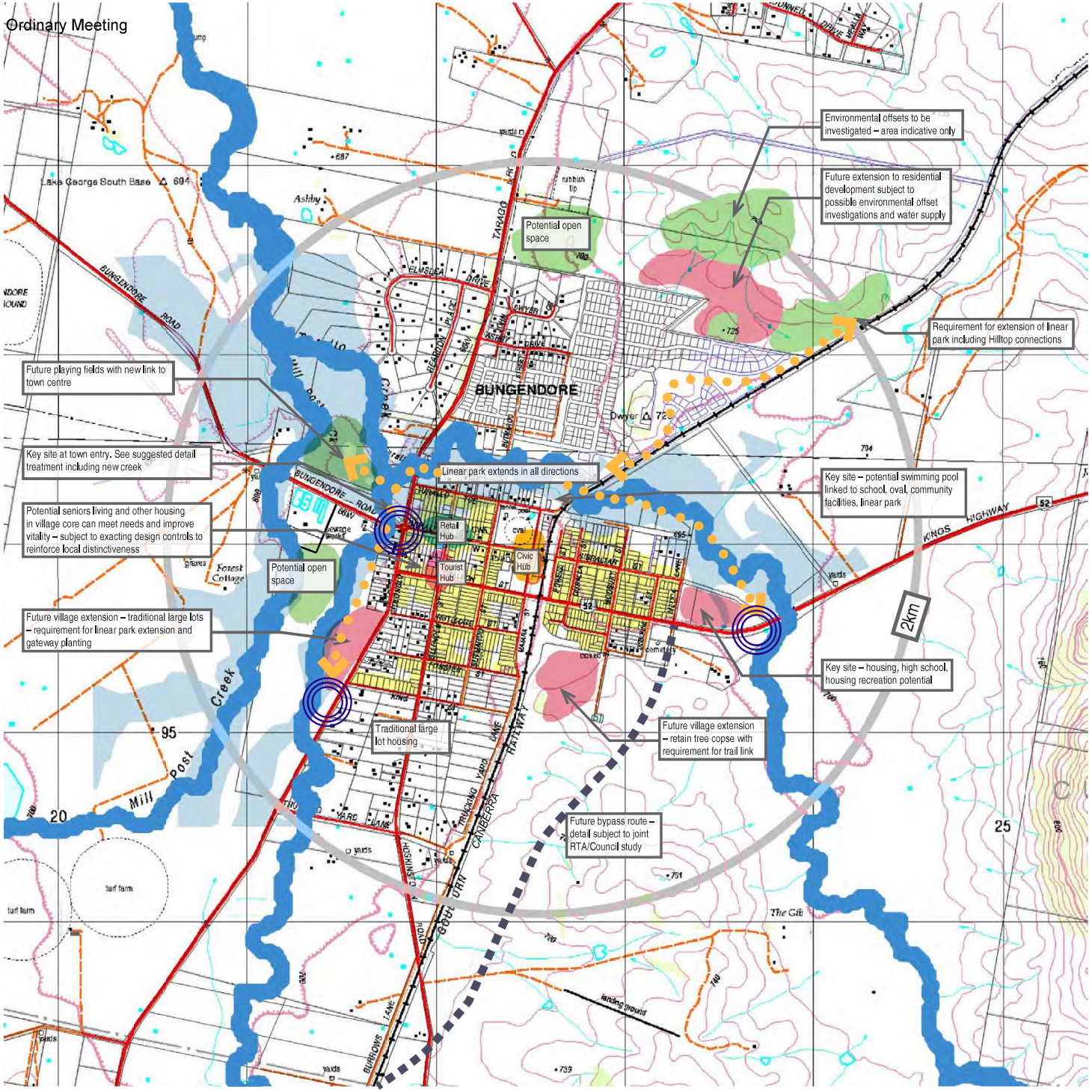
3. Opportunities & Constraints

- Mineral Resources (See body of report for explanation of tones)
- Infrastructure Buffers
- Bushfire Prone Vegetation – Category 1
- Bushfire Prone Vegetation – Category 2
- Bushfire Prone Vegetation Buffer (100m and 30m)
- 100 Year Flood Inundation (known extent)
- Potential High Conservation Value Vegetation
- Visual Prominence
- Steeper Lands

Note: the majority of the undeveloped portions of the study area are identified as Prime Agricultural Land (Class 3).

Scale 1:20,000 at A3

0.2 0 0.5 1.5
Kilometres



Bungendore

Land Use Strategy & Structure Plan

4. Structure Plan

- Township Expansion subject to water supply and other constraints
- Open Space expansion opportunities
- Gateway Treatment
- Indicative Highway Bypass Alignment
- Linear parks and potential extended trails
- Other significant vegetation

See Town Centre Urban Design Plan for detail on:

- Proposed trail/pathway improvements, including creek crossings
- Identification of key village sites with design ideas
- Other structural elements at village scale

Scale 1:20,000 at A3

0.2 0 0.5 1.5
Kilometres

PALERANG COUNCIL

Palerang Local Environmental Plan 2014

Land Zoning Map - Sheet LZN_004A

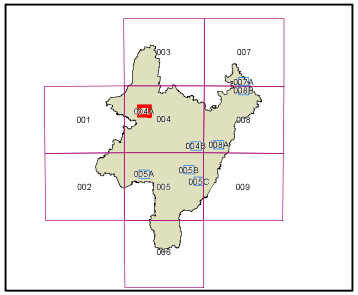
<all other values>

Zone

- B2 Local Centre
- B4 Mixed Use
- E1 National Parks and Nature Reserves
- E2 Environmental Conservation
- E3 Environmental Management
- E4 Environmental Living
- IN2 Light Industrial
- R1 General Residential
- R2 Low Density Residential
- R5 Large Lot Residential
- RE1 Public Recreation
- RE2 Private Recreation
- RU1 Primary Production
- RU3 Foresty
- RU5 Village
- SP1 Special Activities
- SP2 Infrastructure

Cadastre

Cadastre 14/01/14 © Land and Property Information



0 1 km

N

Scale: 1:20,000 @ A3

Projection: GDA 1994
MGA Zone 55

Map identification number: 6180_COM_LZN_004A_020_20140114

