Master Planned community with local through roads directly connected to bushland reserves

Master Planned community with local loop road, central community facilities and open space areas

Attached and multi-unit dwellings fronting community facilities and open space areas

Attached dwellings fronting landscaped pathways through the subdivision

Internal community facilities adjoining residential dwellings.

Internal landscaped areas adjoining residential dwellings.

Landscaped entrance to a Master Planned community delineating between the local road and community areas.

Envisaged Typical Neighbourhood Centre Facades and Street Presentation

Appendix B

ECONOMIC IMPACT ASSESSMENT

Prepared by MacroPlanDimasi

October 2016

Appendix C

SERVICING STRATEGY & TRAFFIC STUDY

All prepared by Geolyse Pty Ltd

August & September 2016

Appendix D

GROUNDWATER AND SALINITY STUDY

Prepared by Envirowest Consulting Pty Ltd

September 2016

Appendix E

ECOLOGICAL ASSESSMENT

Prepared by Ozark Environmental & Heritage Management Pty Ltd

May 2015

Appendix F

CONTAMINATION INVESTIGATION STUDY

Prepared by Envirowest Consulting Pty Ltd

September 2016

Appendix G

ABORIGINAL ARCHAEOLOGICAL ASSESSMENT

Prepared by Ozark Environmental & Heritage Management Pty Ltd

June 2015

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30 March 2017

The General Manager
Dubbo City Council
PO Box 81
DUBBO NSW 2830

Attention: Mr Steven Jennings

Dear Steven,

SOUTHLAKES PLANNING PROPOSAL – LOT 503 DP 1152321; LOT 12 DP 1207280; LOT 14 & 15 DP 1225930; & LOT 399 DP 1199356, SOUTHLAKES ESTATE, DUBBO.

Thank you for your letter dated 15 December 2016 and Council's request for further information. In the time period from the date of your letter we have prepared requested concept plans and impact assessment reports being Acoustic, Ecological, Heritage, Contamination, Salinity and Flooding over the adjoining land parcel Lot 2 DP 880413.

This additional information is provided at Attachments A and B for Councils further consideration along with an amended Planning Proposal Report and we provide the following responses to Councils letter.

Residential Growth Principle 18 – Any residential subdivision should comply with the minimum Internal Connectivity Index (ICI) of 1.3.

We continue to confirm our position that Maas Group properties has never agreed to the provision of an ICI within the Structure Plan as our estate is extremely well connected through its lake and landscape corridors that are provided with high quality footpaths bridges landscaping and evidenced in our online testimonials from Southlakes residents.

Notwithstanding Maas Group Properties ICI position, compliance with Residential Growth Principle 18 being, the internal connectivity index of 1.3 could be achieved over the masterplan layout for the release. It is noted the land to be developed west of the proposed drainage corridor would achieve an ICI of 1.375 as detailed in **Attachment A & B**. it is noted some of these roads in the eastern portion of the site would require further refinement through subsequent Development Application processes.

As discussed with Council the initial stages of the development being the western area of the lot Master Plan would not achieve an ICI of 1.3. The initial stages of residential development to the east of the Existing Southlakes Estate between Argyle Avenue and Boundary Road would achieve an ICI of

1.29. The master plans inability to achieve an ICI of 1.3 in this area is due to the is noncompliance is due to the topography of the site in this area and the presence of subsurface basalt ridge which running north-south through this area. The non-compliance is this area is considered minor and primarily due to these geographical and design constraints.

This basalt geographical feature requires roads and drainage lines to be sympathetically designed 'to work with the feature'. In this regard, the road system north of Azure Avenue has been designed to terminate upon or loop around the ridge, so road gradients and subsequent driver and pedestrian safety would be compliant with Australian Design Standards for road design. Azure Avenue's continuation to the east has been designed to traverse south of this ridge line so as to avoid the constraint as much as possible.

The land to the west of the basalt ridge is also required to drain (sewer and water) to the south over the downstream allotments. Where available the servicing strategy augments the existing systems of Southlakes, however the remainder and primarily the 'W2' storm water catchment is required to drain due south to the drainage channel. Subsequent local roads have been designed to simplify and control the drainage of sewer and storm water, in particular proposed W2 & W7 storm water catchments.

Residential Growth Principle 19 – Residential development shall not be provided backing on to areas of open space and should be separated by a road or other key access point unless the development provides a suitable level of access to open space areas in accordance with the requirements of Western Plans Regional Council (Council), has open and transparent fencing and promotes living areas fronting open space.

Compliance with Residential Growth Principle 19 as described above is achievable as the lots adjoining the drainage corridor would be provided with rear living areas, yards and transparent fencing allowing passive surveillance of the corridor. Fencing requirements adjoining the open space corridor would be ensured through development controls of the DCP and relevant covenants upon the land consistent with those applied in the established southlakes estate which is highly desirable as evident in its continued success.

The corridor would be provided with various entry parks that have foot paths, garden beds and canopy trees. Indicative locations of these entry parks are shown upon the attached Landscape Concept Plan Prepared by APS Landscape Architecture at **Attachment A.**

The existing connection from Stage 17 would be maintained. Alternative access points may be provided where sewer mains are required to traverse these allotments to connect into the sewer main of the drainage channel. These potential locations are shown upon the submitted Sewer Reticulation Plan Numbered 12D, prepared by Geolyse Pty Ltd within the servicing strategy.

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Entrance points would be provided at the three channel crossings and adjoining the B1 commercial site ensuring access would be provided from within the estate. Furthermore, the open space would provide a connection to the Hennessey Road corridor allowing direct connection for residents outside the estate to use the open space.

This open space area would also be connected to the existing, established and heavily utilised open space corridor of Southlakes Estate with its consistent design to that proposed with direct connections to Boundary Road, Wheelers Lane, Azure Avenue, Argyle Avenue and Hennessey Road and its various internal parks ensuring permeability and connection throughout the estate and from adjoining streets.

The level of landscaping and amenity provided to the open space corridor would promote adjoining residential development to 'overlook' its landscaped features and the recreational activity consistent to that of the existing open space corridor of Southlakes.

It is acknowledged that Structure Plan 1 illustrates minimum allotment sizes of 4000m^2 and 2000m^2 for land along the southern boundary of the site and Southern Distributor respectively. Council advise that this was done to provide concentric zoning and development (minimum lot sizes), to provide increasing lot sizes in accordance with the *'Dubbo Residential Areas Development Strategy'* (1996) and to provide parity with Councils other planning decisions made in the URA with respect to density and development. It is noted the Southern Distributor does not form part of the 1996 Strategy, however, Council advise consideration of development densities having regard to potential impacts of the Southern Distributor should also be considered.

The proposed minimum allotment plans are at some variance to that indicated within Structure Plan 1 for the South-East Dubbo Residential Area (URA). The proposed minimum allotment size is considered to be at parity with densities in the immediate area and in particular those located to the west along Hennessy Road, within the existing Southlakes Estate and consistent with land to the west and north east over O'Connor's Land.

As detailed further within this letter additional impact assessment of the site and its future development has been undertaken to understand the constraints of the land and future infrastructure most notably the proposed Southern Distributor. In particular an Acoustic Impact Assessment Report provided at **Attachment B** which considers development densities along the Southern Distributor provides the following discussion:

"In most cases, increased housing density (i.e. smaller lots) and/or increasing the building heights of dwellings fronting major roadways provides effective noise attenuation to remaining lots within subdivision developments. This is due to dwellings effectively forming a 4m to 6m barrier between the noise source and ensuing lots.

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Where larger lots front a roadway, the number of dwellings adjacent to the road is reduced and the open spaces between dwellings allow for propagation of road noise further into the development.

Therefore, it is recommended that the development consider the balance between having less dwellings fronting the Southern Distributor (i.e. larger lots) against the additional attenuation benefits that smaller lots (i.e. denser housing) may provide to the overall development.

Notwithstanding, it is recommended that building orientation within each lot, and the location of habitable rooms (e.g. sleeping areas) should be optimized wherever practicable to locate dwellings and/or sleeping areas as far from the Southern Distributor as possible."

In this respect the proposed density is considered to be consistent with the intent of the structure plan and responsive to development impacts of the proposed Southern Distributor as it provides larger lots to its north in a concentric configuration.

Proposed B1 Neighbourhood Centre Zone

We request Council finalise the assessment of the submitted Economic Impact Assessment to enable exhibition of our Planning Proposal as soon as possible.

It should be noted that the proposed 1.9-hectare site is made after concept consideration of other future development site provisions beyond that of retail floor space. In particular, Councils DCP requires the provision of loading and unloading for the complex, vehicle entry and exit points away from the proposed intersection of the north south spine road and the future Boundary Road, the requirement to provide bus facilities, loading and waste areas and emergency facilities and provisions alongside onsite parking areas.

Connectivity to Adjacent Residential Land

Since initial discussions with Council commenced regarding this Planning Proposal we have sought and now have acquired the adjoining 'Ringlands' property (Lot 2 DP 880413). The 30 lot potential identified by Council is an extrapolation of that limited by the current Dubbo Local Environmental Plan 2011. It is assumed this development yield was determined some time ago and is a result of translated zoning without amendment overtime or detailed regard to a detailed servicing strategy over this area. The submitted PP amends the context of past zonings and infrastructure servicing of this land and provides opportunity to further the residential development of this land.

It is Maas Group Properties Intent to redefine the development of this land by extending the Southlakes Estate to the eastern boundary of Sheraton Road serviced by supporting infrastructure installed during Stage 1 of the Structure Plan.

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As formal planning policy has not been finalized over this land, and subject to the exhibition of the submitted Planning Proposal we would commence preparation of Structure Plan 2 for the 'Ringlands' property to confirm future development intentions and also provide supporting due diligence reports to Council to inform this lands future development at **Attachment B**.

The submitted servicing strategy accommodates 300 Equivalent Tenements for the 'Ringlands' land ensures a substantial part of 'Stage 2' of the URA which has sewer and servicing catchment to the existing infrastructure mains along Hennessy Road.

Additionally, we provide a Master Plan lot layout prepared by Maas Group Properties at **Attachment B** for the development of 'Ringlands' property. This further amended lot layout and road corridor has been designed to:

- Provide and ICI of 1.3;
- Extend and connect local and collector Roads to Boundary and Sheraton Roads and the future freight way to the south;
- Relocation of the freight way into flood prone land to the south;
- Provision of 2000m^2 allotments along the northern side of the freight way corridor and western side of Sheraton Road;

This Master Plan is provided to inform Structure Plan 2 and is been informed by recent due diligence assessment reports provided at **Attachment B** over the land and ongoing discussions with Councils Engineering staff regarding the Southern Distributors likely alignment to the east which would ultimately link to the Mitchell Highway.

It is acknowledged that the Southern Distributor would be located within flood prone land however built above the flood planning level. A Flood Impact Assessment prepared by Cardno is provided at **Attachment B** and concludes the impact of land filled through this area of the flood plan would result in a minor impact upon the Eulomogo Creek flood plain.

Noise Impacts

As discussed above, consideration of acoustic impacts associated with the Southern Distributor upon Henessy Road and the proposed extractive industry (quarry) development to the east are considered within the Acoustic Impact Assessment Report prepared by Muller Acoustic Consulting in **Attachment B**.

Section 6.3 of the attached Acoustic Report provides a qualitative assessment of extractive industry noise to the proposed Southlakes Estate based upon the amended Master Plan Lot Layout. The review identified that the several future lots adjoining Sheraton Road and directly opposite the

proposed quarry are predicted to receive noise levels of between 33dBA to 34dBA which would be compliant with the PSNL of 35dBA.

Section 6.2 of the Acoustic Report considers the *'proposed density arrangements of the land'* as requested by Council and advises:

"in most cases, increased housing density (i.e. smaller lots) and/or increasing the building heights of dwellings fronting major roadways provides effective noise attenuation to remaining lots within subdivision developments. This is due to dwellings effectively forming a 4m to 6m barrier between the noise source and ensuing lots.

Where larger lots front a roadway, the number of dwellings adjacent to the road is reduced and the open spaces between dwellings allow for propagation of road noise further into the development.

Therefore, it is recommended that the development consider the balance between having less dwellings fronting the Southern Distributor (i.e. larger lots) against the additional attenuation benefits that smaller lots (i.e. denser housing) may provide to the overall development."

The supporting acoustic report confirms increased density north of the Southern Distributor is appropriate and recommends more detailed assessment be completed when more contemporary operational data for the Southern Distributor and the proposed quarry are available.

The development of the Southlakes Estate is considered feasible with respect to traffic and quarry noise emissions albeit with the inclusion of several noise control measures outlined within the report.

Therefore, based on the findings of the report, with the inclusion of several noise control measures, there are no noise related issues which would prevent Council approving the proposed project and its proposed allotment regime.

Storm Water Associated with R1 General Residential Lands

It is Maas Group Properties intention to development the proposed R1 lands in accordance with the supporting Servicing Strategy. Councils 'particular concern' regarding the information contained within this servicing strategy being, that the overall increase in storm water discharge from the land is in the order of 18% or (3.84m^3/s) from that modelled by Cardno in their '*Keswick Drainage Review – Assessment of Trunk Drainage Requirements'* is acknowledged and in this regard we confirm that we would ensure this additional 18% is accommodated within the R1 and B1 sites prior to discharge in to receiving water / the drainage channel.

In this respect we propose to provide a storm water management system that would control and discharge storm water generally consistent with that modelled by Cardno in their '*Keswick Drainage*

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Review – Assessment of Trunk Drainage Requirements'. Development Application D2017-57 has been lodged with Council within which the same commitments have been made.

Traffic Associated with the R1 General Residential Lands

It is Maas Group Properties intention to development the proposed R1 lands in accordance with the supporting Traffic Study. In this regard the assessed traffic generated by the proposed R1 sites would be 0.5 per dwelling in accordance with Councils current plans and policy's. It is noted that should the anticipated 'future' development of these sites generate a higher rate per dwelling these developments would be subject to further detailed traffic assessment during the development application process at hand.

Land Zoned RE1 Public Recreation

Within the proposed RE1 zoned land, a storm water channel with lakes would control and direct storm water collected on site to the receiving waters of Eulomogo Creek. In this respect we proposed to provide a storm water management system that would control and discharge storm water consistent with that modelled by Cardno in their '*Keswick Drainage Review – Assessment of Trunk Drainage Requirements'*. Development Application D2017-57 has been lodged with Council within which the same commitments are made.

Location of the Southern Distributor

The proposed location of the Southern Distributor has been discussed at length with Councils Technical Services Division Staff. Discussions regarding filling flood affected land to the south and required separation from the Eulomogo Creek corridor along the southern property boundaries have also informed the positioning of this road. Cardno have been engaged to prepare a supplementary report based upon past Keswick Drainage Study's and having regard to the proposed lot layout and the location of the Southern Distributor.

The location of the Southern Distributor would be located above the flood planning level (as originally advised by Council) and further south to maximize development yield of the site. An amended location of the Southern Distributor including a map of the proposed allotment layout for this land is provided at **Appendix B** for Council's detailed consideration.

It is proposed that the future development of the site be primarily for residential development with associated drainage land as affected by Eulomogo Creek zoned RE2 i.e. riparian corridor, storm water detention with 2000m^2 allotments located upon the northern side of the Southern Distributor and lots of a similar or greater size upon its southern side that would include the land affected by the riparian zone.

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We confirm careful consideration of amended lot layouts and location of the Southern Distributor have been undertaken and are now provided for Councils further consideration.

Currently, no structure plan exists for the development of land east of Stage 1 of the Structure Plan and having regard to the abovementioned discussion we seek Structure Plan 1 have a minor amendment made to identify the Southern Distributor as being within the flood prone land (generally) and to progress Structure Plan 2 of the URA.

We believe the abovementioned amendments would allow for the current Planning Proposal to be finally exhibited and subsequently made alongside the commencement of Structure Plan 2 which would confirm the development intentions for the land to the east.

Figure 1 below is provided to generally illustrate our requested Structure Plan 1 amendments.

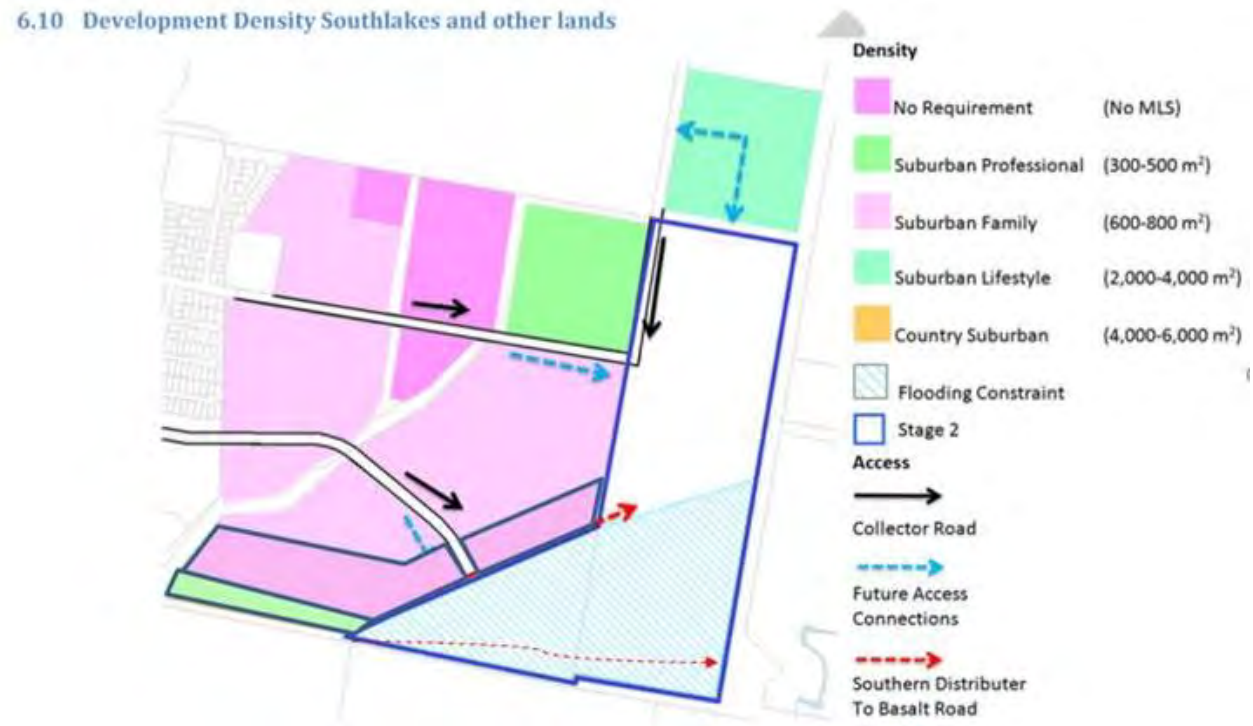

Figure 1: 6.10 Development Density Southlakes and Other Lands Figure extract (as amended)

Voluntary Planning Agreement

The proposed development is supported by GLN Planning's VPA separately submitted to Council. We request Council finalise consideration of our offer and invite discussions to enable the continued development of the URA in the future.

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We trust that this information provided to Council is satisfactory for Council's due consideration of the Development Application.

Please do not hesitate to contact our office should you require any further information.

Kind regards,

Steve Guy
General Manager
Maas Group Properties

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Attachment A

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Attachment B

PLANNING PROPOSAL

PROPOSED REZONING OF R2 LAND AND AMENDMENTS TO THE MINIMUM LOT SIZE WITHIN THE SOUTH EAST URBAN RELEASE AREA

MAAS GROUP PROPERTIES

MARCH 2017

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Collated by Maas Group Properties

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October 2015

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All prepared by Geolyse Pty Ltd
August & September 2016

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GROUNDWATER AND SALINITY STUDY
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September 2016

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ABORIGINAL ARCHAEOLOGICAL ASSESSMENT
Prepared by Ozark Environmental & Heritage Management Pty Ltd
June 2015

Executive Summary

The intention of the Planning Proposal (PP) is to create a planning regime that supports development of the land in a generally consistent manner to that of the existing Southlake's Estate. The PP would provide greater flexibility and choice in residential land and housing product and the provision of a public recreation area within and adjacent to a realigned drainage corridor and the provision of a new neighbourhood centre within the south east urban release area of Dubbo from that currently available under the homogenous residential zoning regime of the *Dubbo Local Environmental Plan 2011 (LEP)*.

The proposed rezoning and subsequent changes to the minimum allotment size of the LEP would facilitate a Master Planned Neighbourhood that would provide;

- Greater flexibility and choice in residential land and housing product within the south east urban release area and the greater residential market of Dubbo. In particular, increasing the medium density and housing choice options in proximity to proposed local collector roads, recreation areas and commercial zones;
- An additional neighbourhood business centre supporting additional local business opportunities in convenient locations for the future residents of the south east of Dubbo; and
- Public recreation areas within and adjacent to the realigned drainage corridor providing opportunities for passive and active recreation for residents of the south east of Dubbo through the landscaped corridor that incorporates cycle ways, footpaths, decorative lakes and parklands.

It is anticipated that primarily the PP would facilitate;

- A combination of single and two storey low density development with some higher building heights achieved upon larger medium density development;
- A neighbourhood business centre of a similar building height to that of surrounding development adjoining and with direct pedestrian and road links to public recreation land and the local road network;
- A retail GFA greater than 1,000m^2 providing the consent authority has considered the economic impact of proposed retail development is satisfied that the development will not have an impact on the commercial hierarchy of Dubbo;
- A retail centre which permits the provision of a gym or like use as defined under the DLEP as recreation facility (indoor);
- Varied infrastructure designed to provide stormwater management integrated into the design of proposed landscaped recreation areas; and
- Recreation and suitable landscaped areas to enhance the amenity of the local area.

This PP affects the *Land Zoning Map – Sheet LZN_008B* and the *Minimum Lot Size Map – Sheet LSZ_008B* of the *Dubbo Local Environmental Plan 2011* (DLEP). In particular, the PP affects three (3) separate land holdings (Lot 503 DP 1152321, Lot 12 DP 1207280 & Lot 399 DP 1199356) within the South East of Dubbo bounded by Boundary Road to the north, Henessy Road to the south Sheraton Road to the east and the existing Southlakes Estate to the west.

This PP seeks to rezone:

- part of the existing R2 – Low Density Residential land to R1 - General Residential land;
- part of the existing R2 – Low Density Residential land to B1 - Neighbourhood Centre;
- part of the existing R2 – Low Density Residential land to RE1 – Public Recreation by the realignment of the existing drainage corridor land (Lot 503 DP 1152321);

The PP seeks to amend the minimum lot sizes for the land affected by the amended rezoning, as follows:

- The southern portion of R2 zoned land to comprise a minimum lot size range of 600m^2 to 4000m^2;

- R1, RE1 & B1 zoned land comprise no minimum lot size;

The R1 and B1 land have been chosen to facilitate higher density residential land options and commercial use land options adjacent to or within close proximity to public recreation land, walkways, and drainage reserves. It is envisioned that the PP would assist in providing a more flexible development suite and potential subdivision layout for each future site within the indicative lot layout of the PP than that currently achievable under the homogenous R2 zoned land.

Due to the minor nature of the proposal, approval of the planning amendments is sought from the Director-General of the Department of Planning as part of the Gateway Determination.

Details of the proposal's compliance with all applicable strategic, regional, and local planning instruments, state environmental planning policies, and ministerial directions are contained in the body of this report.

This PP has been prepared in accordance with the NSW Department of Planning's (DoP) advisory documents *'A Guide to Preparing Local Environmental Plans'* and '*A Guide to Preparing Planning Proposals'.*

Background

1.1 INTRODUCTION

Maas Group Properties have prepared this PP to support a proposed amendment to the *Dubbo Local Environmental Plan 2011*. This PP affects the *Land Zoning Map – Sheet LZN_008B* and the *Minimum Lot Size Map – Sheet LSZ_008B* of the *Dubbo Local Environmental Plan 2011* (DLEP). In particular, the PP affects three (3) separate land holdings (Lot 503 DP 1152321, Lot 12 DP 1207280 & Lot 399 DP 1199356) within the South East of Dubbo bounded by Boundary Road to the north, Henessy Road to the south Sheraton Road to the east and the existing Southlakes Estate to the west.

This land is nearing readiness for development as the existing residential estate of Southlakes progress east towards the property boundary.

The proposed rezoning and subsequent changes to the minimum allotment size of the LEP would facilitate a Master Planned Neighbourhood that would provide;

- Greater flexibility and choice in residential land and housing product within the south east urban release area and the greater residential market of Dubbo. In particular, increasing the medium density and housing choice options in proximity to proposed local collector roads, recreation areas and commercial zones;
- An additional neighbourhood business centre supporting additional local business opportunities in convenient locations for the future residents of the south east of Dubbo; and
- Public recreation areas within and adjacent to the realigned drainage corridor providing opportunities for passive and active recreation for residents of the south east of Dubbo through the landscaped corridor that incorporates cycle ways, footpaths, decorative lakes and parklands.

It is anticipated that primarily the PP would facilitate;

- A combination of single and two storey low density development with some higher building heights achieved upon larger medium density development;
- A neighbourhood business centre of a similar building height to that of surrounding development adjoining and with direct pedestrian and road links to public recreation land and the local road network;
- A retail GFA greater than 1,000m^2 providing the consent authority has considered the economic impact of proposed retail development is satisfied that the development will not have an impact on the commercial hierarchy of Dubbo;
- A retail centre which permits the provision of a gym or like use as defined under the DLEP as recreation facility (indoor);
- Varied infrastructure designed to provide stormwater management integrated into the design of proposed landscaped recreation areas;
- Recreation and suitable landscaped areas to enhance the amenity of the local area.

This PP affects the *Land Zoning Map – Sheet LZN_008B* and the *Minimum Lot Size Map – Sheet LSZ_008B* of the *Dubbo Local Environmental Plan 2011* (LEP).

The proposal is considered to be of a minor nature and in this respect approval is sought from the Director-General of the Department of Planning as part of the Gateway Determination.

Details of the proposal's compliance with relevant strategic, regional, and local planning instruments, state environmental planning policies, and ministerial directions are contained in the following sections.

1.2 SCOPE OF REPORT

This PP has been prepared in accordance with the NSW Department of Planning's advisory documents *'A Guide to Preparing Local Environmental Plans'* and *'A Guide to Preparing Planning Proposals'*. The latter document requires the PP to be provided in four (4) parts, those being;

- *Part 1* – A statement of the objectives or intended outcomes of the proposed LEP;
- *Part 2* – An explanation of the provisions that are to be included in the proposed LEP;
- *Part 3* – The justification for those objectives, outcomes, and provisions and the process for their implementation;
- *Part 4* – Mapping; and
- *Part 5* – Details of the community consultation that is to be undertaken on the Planning Proposal.

It is noted that Part 4 would be confirmed following a Gateway Determination of this Planning Proposal by the NSW Department of Planning and Environment.

1.3 STRUCTURE

This PP is provided in the following structure;

- **Section 2** provides an overview of the subject site; the development intent; and development constraints;
- **Section 3** provides a statement of the objective and explanation of provisions of the PP;
- **Section 4** provides justification regarding the need for the PP; outlines its relationship to strategic planning strategies; and overviews the environmental, economic, and social impacts of the proposal;
- **Section 5** provides the proposed mapping amendments relating to the Planning Proposal area; and
- **Section 6** details how community consultation is to be undertaken with respect to the PP.

Overview

2.1 THE SUBJECT SITE

2.1.1 SITE DESCRIPTION AND LOCATION

This Planning Proposal (PP) affects a portion of land known identified as Lot 399 DP 1199356, Lot 12 DP 1207280 & Lot 503 DP 1152321 within the South East Urban Release Area of Dubbo bounded by the future extension of Boundary Road to the north, Henessy Road and its future extension to the south and the eastern extent of the Southlakes Estate to the west and Sheraton Road to the east.

This land is nearing readiness for development as the existing residential estate development of Southlakes progress east towards the property. This land is located within the visible transition and eastern edge of Dubbo's South Eastern Urban Development Precinct, being the Sheraton Road and Hennessy Road corridors.

Plate 1 provides an aerial view of the land relative to the city of Dubbo and surrounding development which is the subject of this PP.

Plate 1: Aerial view of the subject land, Dubbo City and surrounding development (source: www.maps.sixnsw.gov.au)

2.2 DEVELOPMENT INTENT

The intention of the Planning Proposal (PP) is to provide;

- Greater flexibility and choice in residential land and housing product within the south east urban release area and the greater residential market of Dubbo. In particular, increasing the housing choice options and medium density in proximity to proposed local collector roads, recreation areas and commercial zones;

- A neighbourhood business centre to compliment the south east urban release area with retail services and providing additional local business and employment opportunities; and

- Public recreation areas within and adjacent to the realigned drainage corridor providing opportunities for passive and active recreation for residents of the south east of Dubbo through the landscaped corridor that incorporates cycle ways, footpaths, decorative lakes and parklands

It is anticipated that primarily the PP would facilitate;

- A combination of single and two storey low density development with some higher building heights achieved upon larger medium density development;
- A neighbourhood commercial centre complimenting the surrounding urban release area and its development adjoining and with direct pedestrian and vehicle links to public recreation land and the local road network;
- A retail GFA greater than 1,000m^2 providing the consent authority has considered the economic impact of proposed retail development is satisfied that the development will not have an impact on the commercial hierarchy of Dubbo;
- A retail centre which permits the provision of a gym or like use as defined under the DLEP as recreation facility (indoor);
- Varied infrastructure integrated with the future road and landscaped recreation areas;
- Landscaped recreation spine through the estate that enhances the amenity and connectivity of the estate, its residents and all the various uses within.

2.2.1 EXISTING ZONE REGIME AND PERMISSIBILITY

The existing Land Zoning Map – Sheet LZN_008B describes a land zoning regime for the site of R2 – Low Density Residential with RE1 – Public Recreation Area for Lot 503 being the existing land used to convey overland stormwater through the site.

The current R2 zoning application across the south east precinct results in a large expanse of land area with a predominantly homogenous residential development potential and without a broad choice of housing types supported by a future neighbourhood centre.

The nearest local 'business' centres are approximately 2km to the north and west from the sites north western corner (via either Boundary Road and Wheelers Lane) with other business zoned land located along the Mitchell Highway (Cobra Street) to the east and west.

The B1 Local Centre Zone land use table is a closed table and does not permit the use of land zoned B1 for use as a 'recreation facility (indoor). An LEP B1 land use table extract is provided below:

Zone B1 Neighbourhood Centre

1 Objectives of zone

- To provide a range of small-scale retail, business and community uses that serve the needs of people who live or work in the surrounding neighbourhood.

- To ensure the growth of each neighbourhood centre is consistent with the commercial hierarchy of the City of Dubbo.

2 Permitted without consent

Environmental protection works; Home-based child care; Roads

3 Permitted with consent

Amusement centres; Boarding houses; Business premises; Car parks; Child care centres; Commercial premises; Community facilities; Educational establishments; Entertainment facilities; Environmental facilities; Function centres; Health consulting rooms; Home businesses; Home industries; Home occupations; Information and education facilities; Medical centres;

Neighbourhood shops; Passenger transport facilities; Places of public worship; Respite day care centres; Shop top housing; Signage; Tourist and visitor accommodation; Veterinary hospitals; Waste or resource transfer stations; Water reticulation systems

4 Prohibited

Advertising structures; Bed and breakfast accommodation; Bulky goods premises; Cellar door premises; Farm stay accommodation; Garden centres; Hardware and building supplies; Kiosks; Landscaping material supplies; Markets; Office premises; Plant nurseries; Pubs; Restricted premises; Roadside stalls; Rural supplies; Timber yards; Vehicle sales or hire premises; ***Any other development not specified in item 2 or 3***

Plate 2 below details the current land zoning regime within the South East Precinct.

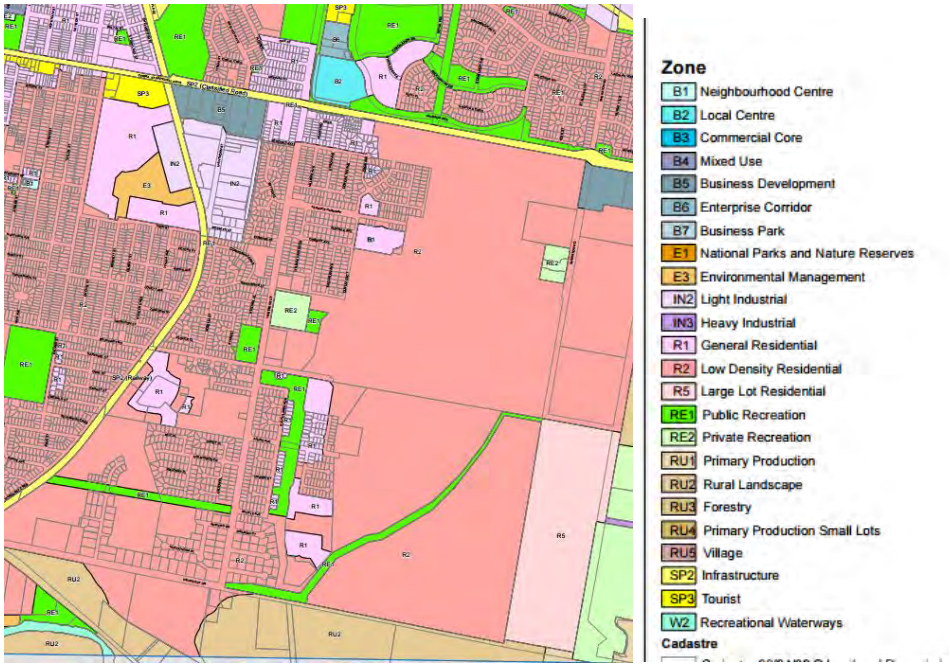

Plate 2: DLEP 2011 Zoning Map LZN_008B extract (Source: www.legislation.nsw.gov.au)

Additional local provisions also apply to the shops in Zone B1 Neighbourhood Centre as prescribed by Clause 7.12 of DLEP the objective of this clause is to maintain the commercial hierarchy of Dubbo by encouraging retail development of an appropriate scale within neighbourhood centres. Subclause (2) does not allow Council to grant development consent to retail development that will exceed a GFA of 1,000m^2. Clause 7.12 extract of the DLEP is provided below:

7.12 Shops in Zone B1 Neighbourhood Centre

(1) The objective of this clause is to maintain the commercial hierarchy of Dubbo by encouraging retail development of an appropriate scale within neighbourhood centres.

(2) Despite any other provision of this Plan, the consent authority must not grant development consent to development for retail premises on land within Zone B1 Neighbourhood Centre if the gross floor area of the development will exceed 1,000 square metres.

(3) Before granting consent to development for the purpose of shops having a gross floor area of 500 square metres or greater, in either one separate tenancy or any number of tenancies, the consent authority must consider the economic impact of the proposed development and be satisfied that the proposed development will not have an adverse impact on the commercial hierarchy of Dubbo.

2.2.2 EXISTING MINIMUM LOT SIZE RESTRICTIONS

Upon viewing the LEP Minimum Lot Size Map – Sheet LSZ_008B the predominant minimum lot size for the majority of R2 zoned land upon the site is 600m^2 with a minimum lot size of 4000m^2 for land adjoining Henessy Road.

Southlakes Estate

The existing residential land within the developed Southlakes Estate is comprised of:

- R1 zoned Land adjoining the stormwater 'lakes' system with no minimum lot size;
- R1 zoned land adjoining the stormwater 'lakes' system with a minimum lot size of 300m^2;
- R2 zoned land adjoining the creek lake system and also generally comprising the majority of the sites land mass with a minimum lot size of 600m^2;
- R2 zoned land in the southern portion of the site north of Hennesy Road with a minimum lot size of 2000m^2

Business and Recreation Land

No minimum lot size is applicable for business zoned land or public recreation land consistent with the general provisions of the LEP as detailed upon the current LEP minimum lot size map shown in Plate 3 below.

The current minimum lot size application across the south east precinct results in a large expanse of land area with a predominantly homogenous residential development potential in the form of standard low density residential subdivision.

Plate 3 below details the current minimum subdivision allotment size regime permissible under the LEP within the South East Precinct. The site is outlined in red.

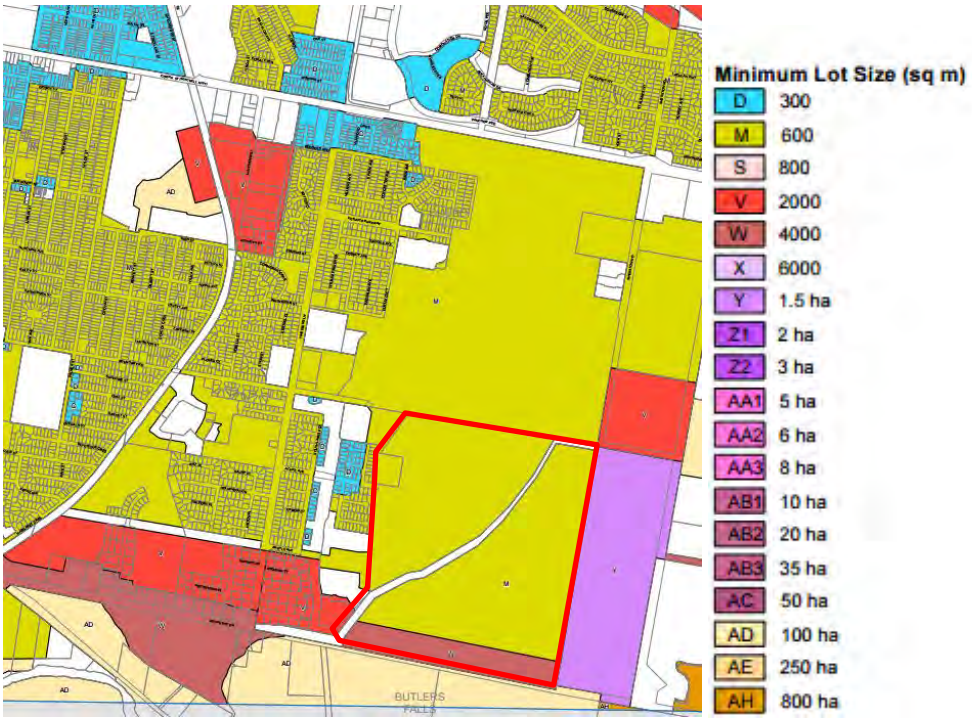

Plate 3: DLEP 2011 Minimum Lot Size Map LSZ_008B extract (Source: www.legislation.nsw.gov.au)

2.2.3 PROPOSED ZONE REGIME

The intention of the rezoning is to provide;

- A combination of single and two storey low density development with some higher building heights achieved upon larger medium density development;
- A neighbourhood commercial centre complimenting the surrounding urban release area and its development adjoining and with direct pedestrian and vehicle links to public recreation land and the local road network;
- A retail GFA greater than 1,000m^2 providing the consent authority has considered the economic impact of proposed retail development is satisfied that the development will not have an impact on the commercial hierarchy of Dubbo;
- A retail centre which permits the provision of a gym or like use as defined under the DLEP as recreation facility (indoor);
- Varied infrastructure integrated with the future road and landscaped recreation areas;
- Landscaped recreation spine through the estate that enhances the amenity and connectivity of the estate, its residents and all the various uses within.

Plate 4 below shows the proposed zoning amendments within the South East Precinct.

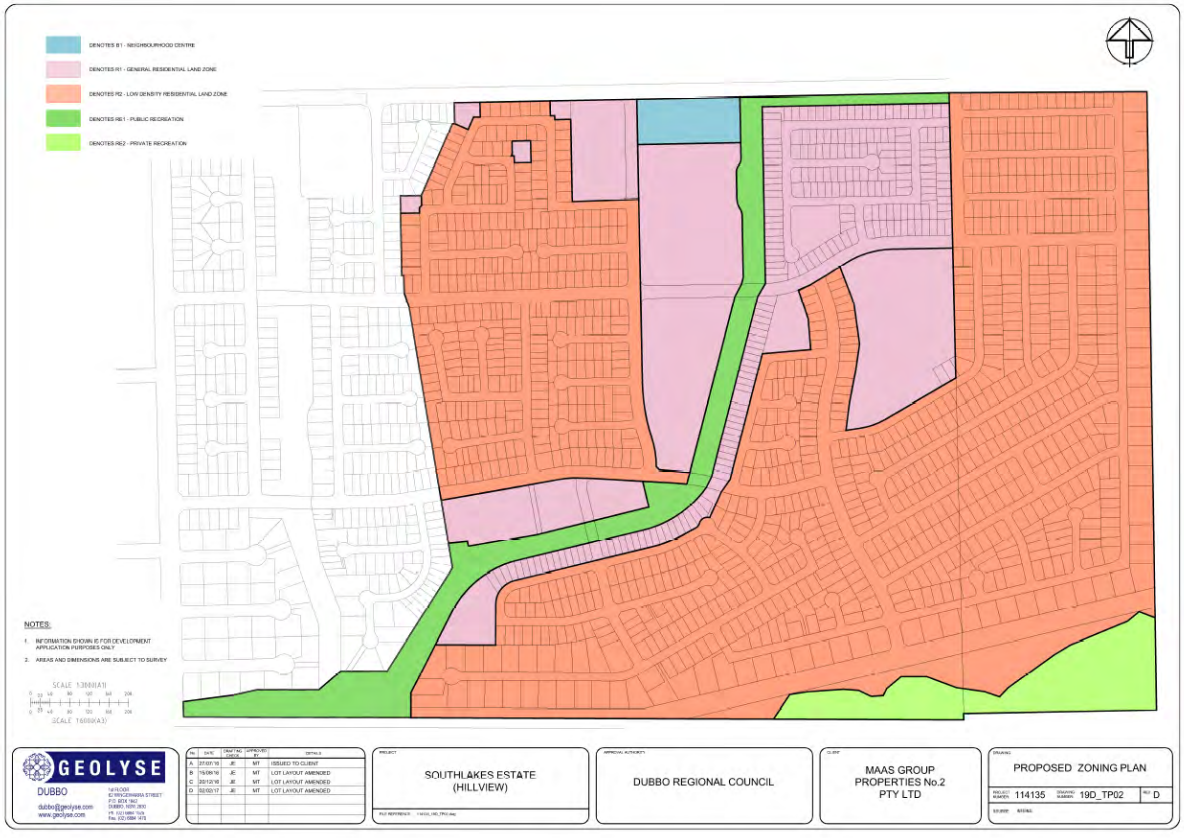

Plate 4: Proposed zoning plan extract (Geolyse Pty Ltd 114135_19D_TP02)

The proposed zoning regime has been developed to;

- Provide a for a variety of housing types and densities;
- Provide higher density residential living adjacent to or within close proximity to neighbourhood shops, public recreation land, cycle ways, walkways, and drainage reserves;
- Provide low density housing within a landscaped setting on the fringe of the Dubbo urban area;

- Provide a range of small-scale retail, business and community uses that serve the needs of people who live or work within the immediate surrounding neighbourhood whilst ensuring the economic viability of the Dubbo CBD and surrounding business zones
- Provide land for infrastructure and related uses;
- Provide land to be used for public open space and recreational purposes; and
- Enhance existing drainage infrastructure land and its surrounding natural environment for recreational use.

2.2.4 PROPOSED MINIMUM LOTS SIZE REQUIREMENTS

In accordance with the Land Zoning Map LZN_008B and Lot Size Map LSZ_008B of the *Dubbo Local Environmental Plan 2011* (LEP), the identified R1 – General Residential land is accompanied by no minimum lot size and a minimum lot size of 450m^2 and the majority of the identified R2 – Low Density Residential land is accompanied by a minimum lot size of 600m^2 with the remaining R2 land having a minimum lot size of 800m^2 and 2000m^2. No minimum lot size applies to RE1 or B1 zoned land of the LEP generally consistent with that immediately to the west.

The proposed B1 zone is approximately 19,500m^2 in area with approximate dimensions of 209.5m (Boundary Road frontage) and 93m (drainage reserve frontage).

Plate 5 below shows the proposed minimum lot size amendments within the South East Precinct.

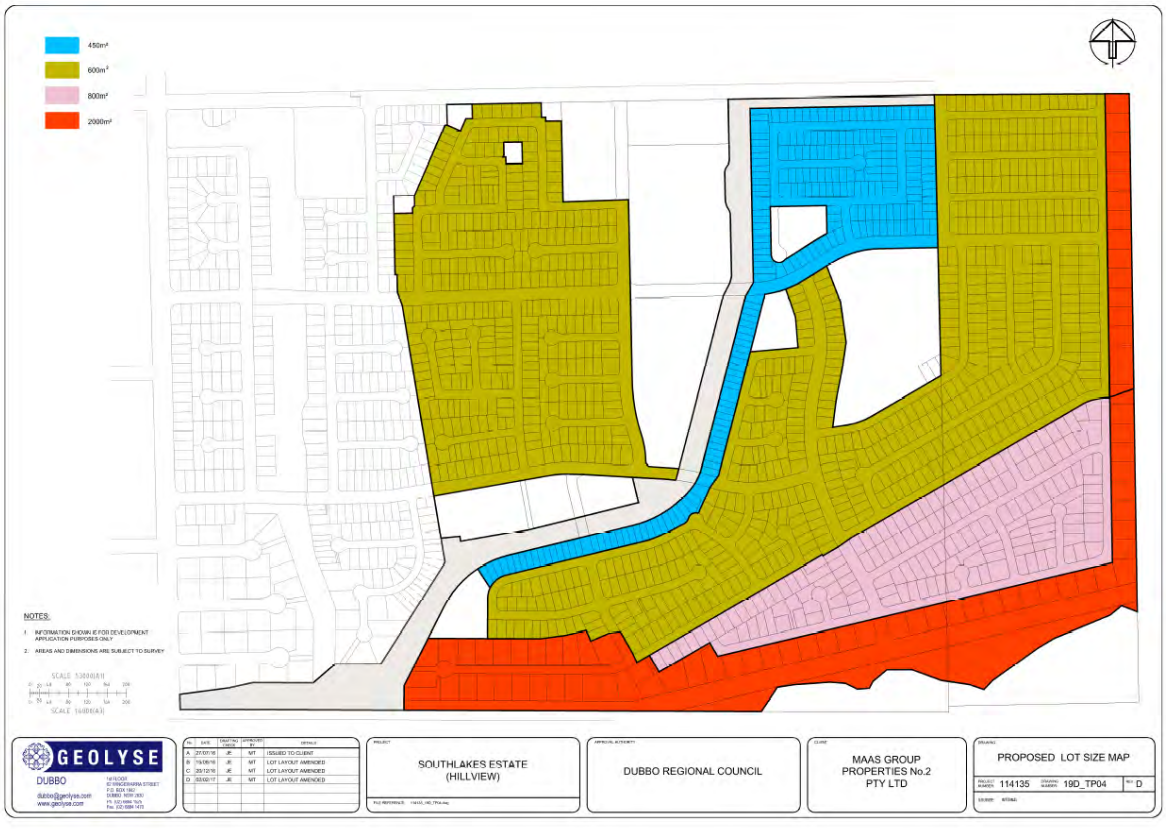

Plate 5: **Proposed lot size plan extract (Geolyse Pty Ltd 114135_19D_TP04)**

As stated above, the intention of the amendment to the minimum allotment size for residential zoned land is to provide greater flexibility and choice in residential land and housing product within the south east land release areas and the greater residential market of Dubbo.

As the future development of these sites would facilitate the establishment of different types of residential development and lots beyond that currently achievable under the LEP land zoning and lot size provisions.

No minimum lot size is provided for B1 and RE1 zoned land consistent with current minimum lot size requirements under the *Dubbo Local Environmental Plan 2011.*

In this regard an amendment to the abovementioned Land Zoning and Lot Size provisions of the LEP would be required in order for the future development of these sites to be permissible and compliant.

2.2.5 ANTICIPATED DEVELOPMENT TYPOLOGIES

It is anticipated that primarily the PP would facilitate a combination of single and two storey development with the majority of development being single storey in height.

The following types of housing to be provided within the R1 zoned land would be:

1. Traditional medium density (multi dwelling housing) development generally in the form of attached 2 bedroom single storey dwellings approximately 4 to 6 dwellings long.

2. Small lot housing (attached and semi-detached dwellings), generally where divided by through roads and drainage corridors and in the form of attached and detached dwellings with minimal private curtilage upon local through roads.

3. Integrated house and land development (Multi dwelling housing, attached dwellings, semi-detached dwellings, and dwellings) with private roads, open space and community facilities.

It is anticipated that the R1 zoned areas would be developed with a mix of all forms of housing ranging from the traditional medium density housing to integrated house and land development.

It is envisaged that the R2 zoned areas would be developed with a mix of traditional house and land development with larger lot living located along the southern fringe.

It is anticipated that the B1 zoned land would be developed with a local neighbourhood business centre that provides a range of supporting retail uses centred around a supermarket with associated parking, loading and unloading, and landscaped areas.

It is envisaged that the RE1 zoned land would be landscaped with a range of vegetation and developed with decorative lakes children's playground and footpaths to provide active and passive recreation areas for residents.

Examples of concept development designs have been compiled to give Council an understanding of the general form and style of development anticipated for the proposed zones are provided at **Appendix A**.

2.2.6 PROPOSED DEVELOPMENT OBJECTIVES

The development of the land is to be developed generally in accordance with the following objectives

- Provide for a neighbourhood centre, attached dwellings and multi dwelling housing in areas of increased amenity including land adjoining or opposite:
    - Neighbourhood centre shops;
    - Parks and open space; and
    - Drainage land corridor.
- Provide opportunities for community open space integrated into the subdivision design.
- Provide opportunities for an increased range of smaller residential lot sizes and varied housing product to the community whilst not preventing the development of detached, single storey dwellings and provide options to make these housing options easier to deliver.
- Provision of local roads including loop roads and laneways for traffic circulation through these areas.

It is noted that future development would be required to be designed in accordance with the objectives of the Dubbo Local Environmental Plan 2011 and Dubbo Development Control Plan 2013, in particular

the development controls for privacy, noise, streetscape amenity and parking provision would be maintained.

In addition to the above objectives it is anticipated that each land use zone would be developed with consideration to the following general objectives:

R1 zoned land

- Provide housing with access to the landscaped 'lakes' corridor which facilitates an active recreation link between the residential zoned land and the neighbourhood centre;
- Provide both local loop roads and lane ways through the larger land areas to create an efficient subdivision layout with effective vehicle and pedestrian circulation;
- Provide varied lot sizes and housing product opportunities integrated with community facilities and open space areas upon larger land areas;
- Provide varied medium density housing options upon smaller land areas including those adjoining and adjacent to opens space and commercial areas;

The market is considered able to provide sufficient varied housing product that is attractive, modern, of good design, employs standard sustainable design provision and is suitably landscaped to ensure an attractive and well-designed development without detriment to future resident's amenity.

It is noted this development is currently being developed within existing R1 zoned land within Southlakes.

R2 zoned land:

- Provide housing with access to the landscaped 'lakes' corridor which facilitates an active recreation link between the residential zoned land and the neighbourhood centre;
- Provide local roads with a mix of traditional grid and some cu-de-sac formation through the majority of the land area to create an efficient subdivision layout with effective vehicle and pedestrian circulation and a range of streetscape typologies;
- Provide varied lot sizes and housing product opportunities with the allotments generally increasing in size as they progress from north to south of the site.

The market is considered to continue to provide attractive, modern, of good design, low density housing products that are suitably landscaped which when the land is full developed would provide for an attractive and well-designed estate.

It is noted this development is currently being developed within existing R2 zoned land within Southlakes.

B1 zoned land:

- Provide a neighbourhood commercial centre with a range of uses to service the daily needs of residents of area;
- Provide a neighbourhood centre with direct access to the adjoining 'lakes' corridor which provides an effective pedestrian link between the neighbourhood centre and the residential zoned land;
- Provide a neighbourhood centre separated from adjoining residential use areas through adjoining roads and landscaped corridor;
- Provide a neighbourhood centre which maintains the commercial hierarchy of Dubbo by providing retail development of an appropriate scale;
- Provide a neighbourhood centre of between 5,000m^2 and 6000m^2 which accommodates a supermarket of at least 3500m^2 and ancillary supporting retail outlets including a gym;
- Provide a neighbourhood centre with direct access to Boundary Road to confirm its identity as the local neighbourhood centre for the urban release area.

The market is considered to provide attractive, modern, good design, commercial development appropriate to surrounding residential and landscaped recreation areas as demonstrated within supporting Economic Impact Assessment prepared by MacroPlan Dimasi dated October 2015 at Appendix B.

It should be noted that the MacroPlan Dimasi assessment includes the recent closure of the full size IGA supermarket within Orana Mall. This amendment within the Dubbo market place adds to the undersupply of supermarket floor space by approximately 3000m^2 (being the floor space of the Super IGA Store previously accounted for in Councils economic impact assessments) resulting in additional capacity within the economy for the provision of an additional supermarket.

RE1 zoned land:

- Provide a landscaped drainage corridor with decorative shallow lakes system through the landscape;
- Provide passive and active recreation areas for use by residents of the area in the form of a children's playground, cycleways, footpaths and bridges meandering through and over a central drainage corridor;
- Provide a landscaped corridor that facilitates additional pedestrian and cycle permeability through the area to adjoining major public transport corridors of Boundary Road, Henessy Road, Wheelers Lane, Sheraton Road including the future freight way;
- Provide a connection through the residential estate to the local neighbourhood centre and adjoining residential estates.

The industry is considered duly able to provide good infrastructure and landscaped areas that would achieve the above objectives as generally designed and detailed within the servicing strategy provided at Appendix C.

2.2.7 SERVICES

A servicing strategy has been prepared and includes the provision of future local roads, water, sewer, stormwater mains infrastructure to support the future development consistent with the required service providers design requirements and similar to that of surrounding arrangements of the urban release area.

In general, telecommunications, roads, power and water service mains are being constructed/extended from the existing mains located to the west within Boundary Road, Wheelers Lane, Argyle Avenue, Azure Avenue and Henessy Road with sewer and stormwater being extended and augmented from their respective downstream mains and would be generally located within the proposed drainage corridor.

The land is to be serviced by all available reticulated utilities, including power, telephone, gas, water and sewerage as are available in the greater locality. Necessary provision and upgrading where required to facilitate the development is acknowledged and generally detailed within the servicing strategy provided at Appendix C. All services would conform to the requirements of the relevant service authority.

2.2.8 TRAFFIC & TRANSPORT CONSIDERATION

R1 and R2 zoned land:

The supporting Traffic Study prepared by Geolyse dated August 2016 and provided at Appendix C calculates the predicted traffic generation rates for the estate once developed in accordance with that indicated upon the masterplan plans numbered 114135_19B_TP02 & TP04.

Once fully constructed the proposed residential estate would be provided with east/west and north/south local collector/spine roads that link to the surrounding local collector roads of Boundary Road, Hennessy Drive and Wheelers Lane

The study identifies additional vehicle trips are not considered to have an adverse impact upon traffic congestion within the surrounding road network and generally result in service levels of A and B for the roads of Boundary Road, Wheelers Lane and their respective intersections as modelled using SIDRA.

It is considered that the surrounding and future road network is of sufficient capacity to cater for the future increase in vehicle trips once developed.

B1 zoned land:

The Neighbourhood Centres would comprise a super market and supporting small retail shops as being like uses that would generate similar trip rates.

The supporting traffic study identifies that the proposed site would be of sufficient area for the provision of onsite parking, loading and unloading and circulation areas.

Once fully constructed the proposed site would provide sufficient area for onsite parking and vehicle circulation that connects to the adjoining road network.

The increase in additional vehicle trips are not considered to have an adverse impact upon traffic congestion within the surrounding road network as they would be designed and constructed to support the additional vehicle trips generated from such development. It is considered that the future surrounding road network is of sufficient capacity to cater for the increase in vehicle trips once developed.

Should future development be considered to generate traffic at a higher rate than that identified within the supporting traffic impact assessment report. Such development would be required at the development application stage of development to demonstrate it would be suitable within the surrounding road network.

2.3 ENVIRONMENTAL CONSIDERATION

2.3.1 TOPOGRAPHY AND SOILS

The subject site has a gradual slope from north east to south west generally following the existing drainage route through the site. The landform contains trees scattered across the site however is predominantly cleared and maintained for agricultural grazing. Some stormwater drainage has been constructed and runoff is directed into the existing drainage corridor network being an informal open grass overland flow path / channel which ultimately discharges to the designed and partially built southern drainage channel of Southlakes Estate.

The land subject of this PP, is located within the Talbragar Valley Subregion of the Brigalow Belt South Bioregion. Within this subregion Morgan and Terrey (1992) describe the soil environment as;

"Thin stony loams and texture contrast soils over most of the landscape with deeper sands and brown earths on valley floors".

This soil type is consistent with being able to sustain urban development such as residential development subject to design improvements to ensure soil salinity and erosion impact are minimised as detailed below.

2.3.2 SALINITY AND GROUNDWATER

The proposal would have the potential to increase the density of development across the subject sites of varying degree depending upon the proposed zone. The land is mapped by the DLEP 2012 Natural Resource Biodiversity Map Groundwater Vulnerability Map – Sheet CL_008 as being of 'Moderately High Vulnerability'. The development intention for these sites being for a majority of residential with supporting neighbourhood centre development and road and stormwater management infrastructure. The resultant development would manage stormwater collection and disposal in a controlled fashion reducing the threat to the contamination of groundwater or exacerbation of soil salinity.

A *Groundwater and Salinity Study* by Envirowest Consulting has been prepared for the future residential layout of the site and is provided at Appendix D. The objective of this report was to provide detailed information including mitigating options (if required) in relation to dryland and urban salinity processes and groundwater. The report assesses the existing salinity conditions of the soil and groundwater and determine the impact of the development on groundwater.

Generally, the report concludes that the development is suitable for the site and intended development to the area and is of a scale and location in the landscape that is not considered to be high risk and measures are recommended to ensure intended development mitigates any adverse impacts.

Consideration of adjoining land has been undertaken in the form of a Salinity Assessment also prepared by Envirowest Pty Ltd. This report will be provided under separate cover to inform Stage 2 structure planning.

2.3.3 FLORA AND FAUNA

As described within the supporting *Ecological Assessment* prepared by Ozark Pty Ltd and provided at Appendix E the site is completely cleared, ploughed and disturbed with few isolated trees.

No known threatened species or ecological communities have been identified as being currently present on these sites. The study identified that the that the vegetation noted upon the site is likely to have been derived from one of the three EECs listed under the TSC Act. In accordance with the TSC Act the 'precautionary principle' has been adopted and an Assessment of Significance has been completed for each to characterise the potential impacts.

Assessments of significance are included within the supporting ecological assessment and having given consideration to the ecology within the subject site, the report concludes the Proposal is:

- Unlikely to significantly affect any of the listed threatened species, fauna populations or communities.
- Unlikely to augment or significantly contribute to any of the National or State listed Key Threatening Processes, if the appropriate safeguards regarding the control of potential vertebrate pests are effectively applied.
- Unlikely to significantly affect any RAMSAR wetland or CAMBA, ROKAMBA or JAMBA listed species;
- Unlikely to significantly affect local hydrology.
- Consistent with ESD principles with regard to fauna, would not adversely affect the local biodiversity and no issue of intergenerational or value added matters are relevant in this instance.

The report concluded that the proposed activity should not be considered to constitute a significant impact and, as such, no Species Impact Statement (SIS) is warranted. No Koala Habitat Management Plan pursuant to SEPP 44 should be required.

Consideration of adjoining land has been undertaken in the form of an Ecological Assessment also prepared by Ozark Pty Ltd. This report will be provided under separate cover to inform Stage 2 structure planning.

2.3.4 BUSHFIRE

Reference is made to Dubbo City Council's Bushfire Prone Land Map which indicates the level of fire risk for properties. In accordance with this Map, the subject land is not identified as being located on bush fire prone land.

2.3.5 FLOODING

The proposed rezoned land is not identified as being within a flood planning area as identified by the *Dubbo Local Environmental Plan 2011.* In this regard the proposed rezoning and the lands future development would not be affected by potential flooding nor result in adverse impact upon the immediate locality.

Consideration of development intention within flood prone land has been undertaken in the form of due diligence environmental reports and discussions with Council's Engineering Staff over the location of

the proposed Southern Distributor. Detailed discussions and supporting reports will be provided under separate cover to inform Stage 2 structure planning.

2.3.6 CONTAMINATION

The soils contained in the area of land proposed for rezoning under this Planning Proposal are of similar quality to that present within the bounds of the adjoining Southlakes Estate. Each of these site have previously been assessed and considered as suitable for residential use and development by past planning rezoning and current development applications across their land.

Notwithstanding, a *Contamination Investigation Study* was conducted by Envirowest Consulting Pty Ltd for the land to ensure the land is suitable for its intended use. The contamination investigation was prepared in accordance with the Contaminated Land Management Guidelines referenced by *State Environmental Planning Policy No. 55 - Remediation of Land*. The final conclusion of the Contamination Investigation Report is as follows:

- The site has a land-use history of grazing;
- There is no evidence of orchards, mines, sheep dips, mixing sheds or contaminating industrial activities on the site;
- The contamination status of the site was assessed from a soil sampling and laboratory analysis program. The soil sampling program did not detect elevated levels of the analysed metals, OCP or TRH. The levels of all substances evaluated were below the EPA investigation threshold for residential and recreational land-use with access to soil. In conclusion no contamination was found;
- Several stockpiles were located across the site. The stockpiles consisted of soil and timber and trace general refuse. No asbestos was identified in the stockpiles on site. The stockpiles are an amenity hazard.

The subject site is therefore suitable for the future residential and recreational activities land uses.

Consideration of adjoining land has been undertaken in the form of a Preliminary Contamination Report also prepared by Envirowest Pty Ltd. This report will be provided under separate cover to inform Stage 2 structure planning.

2.4 SOCIAL AND CULTURAL CONSIDERATION

2.4.1 ABORIGINAL ARCHAEOLOGY

An *Archaeological Survey* was conducted by Mr Jim Kelton in August 1995 covering all of the Southlakes Estate, as well as the majority of the land adjacent to Southlakes Estate / Keswick on the Park Estate.

The *Archaeological Survey* was conducted on behalf of Dubbo City Council, in order to assess the potential impacts of the proposed residential developments of the area on local Aboriginal Cultural Heritage, within the terms of the New South Wales *National Parks and Wildlife Act 1974* and the *Environmental Planning and Assessment Act 1979*.

Keltons survey identified the presence of one (1) site located adjacent to the southern boundary of the site which is identified and recorded upon the AHIMS database.

Notwithstanding the above survey Ozark Environmental Management and Heritage conducted an *Aboriginal Archaeological Assessment* of the land to determine the presence and potential impact of the proposal upon aboriginal heritage significance of the area. The assessment is provided at Appendix G.

The survey identified that the land is not likely to contain additional items and that the significance of the existing item is considered 'low'. In this respect and having regard to the indicative lot layout and likely servicing strategy the existing item is likely to require removal through the issue of an AHIP.

It should be noted that if, during the further development of the site, any artefact, potential site or objects of Aboriginal Cultural Heritage Significance are uncovered, works will cease immediately pending referral for an investigation by the NSW National Parks and Wildlife Service in accordance with *the National Parks and Wildlife Act 1974*.

Consideration of adjoining land has been undertaken in the form of an Heritage Report also prepared by Ozark Pty Ltd. This report will be provided under separate cover to inform Stage 2 structure planning.

2.4.2 EUROPEAN HERITAGE

The land immediately to the south contains a locally listed heritage item identified by the DLEP as a 'Old Dubbo Homestead'. As the item is segregated by an existing road corridor, future freight way and the Eulomogo Creek it is anticipated that the proposed rezoning and amendments to the minimum allotment size would not adversely impact upon the item and that any future development of this land would not require consideration of the Heritage Item.

The remaining sites do not contain any locally listed heritage items as identified by the DLEP. In this regard the proposed rezoning is not considered to adversely affect the heritage significance of the locality.

Consideration of adjoining land has been undertaken in the form of an Heritage Report also prepared by Ozark Pty Ltd. This report will be provided under separate cover to inform Stage 2 structure planning.

Intent and Provisions

3.1 OBJECTIVE

The intention of the Planning Proposal (PP) is to create a planning regime that supports development of the land in a generally consistent manner to that of the existing Southlake's Estate. The PP would provide greater flexibility and choice in residential land and housing product and the provision of a public recreation area within and adjacent to a realigned drainage corridor and the provision of a new neighbourhood centre within the south east urban release area of Dubbo from that currently available under the homogenous residential zoning regime of the Dubbo Local Environmental Plan 2011 (LEP).

3.2 EXPLANATION OF PROVISIONS

This PP affects *Land Zoning Map – Sheet LZN_008B* and *Minimum Lot Size Map – Sheet LSZ_008B* of the DLEP.

This PP seeks to rezone a part of the existing R2 – Low Density Residential land within the South East Precinct of Dubbo as shown upon supporting plans **114135_19B_TP02 & TP04 prepared by Geolyse Pty Ltd** in particular rezone;

The proposed rezoning and subsequent changes to the minimum allotment size of the LEP would facilitate a Master Planned Neighbourhood that would provide;

- Greater flexibility and choice in residential land and housing product within the south east urban release area and the greater residential market of Dubbo. In particular, increasing the medium density and housing choice options in proximity to proposed local collector roads, recreation areas and commercial zones;
- An additional neighbourhood business centre supporting additional local business opportunities in convenient locations for the future residents of the south east of Dubbo; and
- Public recreation areas within and adjacent to the realigned drainage corridor providing opportunities for passive and active recreation for residents of the south east of Dubbo through the landscaped corridor that incorporates cycle ways, footpaths, decorative lakes and parklands.

It is anticipated that primarily the PP would facilitate;

- A combination of single and two storey low density development with some higher building heights achieved upon larger medium density development;
- A neighbourhood business centre of a similar building height to that of surrounding development adjoining and with direct pedestrian and road links to public recreation land and the local road network;
- A retail GFA greater than 1,000m^2 providing the consent authority has considered the economic impact of proposed retail development is satisfied that the development will not have an impact on the commercial hierarchy of Dubbo;
- A retail centre which permits the provision of a gym or like use as defined under the DLEP as recreation facility (indoor);
- Varied infrastructure designed to provide stormwater management integrated into the design of proposed landscaped recreation areas;
- Recreation and suitable landscaped areas to enhance the amenity of the local area.

The R1 and B1 land have been chosen to create higher density residential and commercial use land adjacent to or within close proximity to public recreation land, children's playground, walkways and cycleways in an effort to facilitate a flexible subdivision layout for each site than that currently achievable under the homogenous zoning and minimum allotment regime of the LEP.

Justification

The overarching principles that guide the preparation of PP's are:

- The level of justification should be proportionate to the impact the PP would have;
- It is not necessary to address a question if it is not considered relevant to the PP; and
- The level of justification should be sufficient to allow a Gateway determination to be made with confidence that the LEP can be finalised within the timeframe proposed.

The following justification addresses each relevant question applicable to the PP to ensure confidence can be given to the Gateway determination.

4.1 NEED FOR THE PLANNING PROPOSAL

4.1.1 RESULT OF ANY STRATEGIC STUDY OR REPORT

The PP is not a result of a strategic study or report but rather the current demand of housing choice and residential land product and the need to provide additional local recreation and a local neighbourhood centre within South East Dubbo.

Current land release areas of Dubbo are heavily focused upon delivering the standard R2 – Low Density land and house package yet limited focus exists on delivering medium density options or larger land size.

The existing land supply within the varied zoning regime of the current Southlakes Estate is likely to be exhausted and developed with varied housing product in the near future.

The proposed rezoning seeks to provide a regime for how the land would be developed in the future to create a master planned neighbourhood with a neighbourhood centre and passive and active landscape recreation areas which also serve a dual function of drainage.

Having regard to these current market forces and the reality of housing choice and residential land product within Dubbo it is considered that there is sufficient demand upon the housing market to warrant the expansion of the existing R1 – General Housing zone and continue to vary minimum lot size requirements of both the R1 and R2 zone of the LEP to assist the facilitation of housing choice and varied residential land product centred around a neighbourhood shopping centre within the South East of Dubbo.

The proposed zoning and minimum allotment regime is selected having regard to the lands proximity to public recreation areas, drainage reserve, cycleway and walkways and their proximity to supporting road and infrastructure networks including public transport services. The allotment plan is also focused toward the proposed neighbourhood centre and with regard to the required infrastructure that would support the increased density and commercial development options.

4.1.2 BEST MEANS OF ACHIEVING THE OBJECTIVES OR INTENDED OUTCOMES, OR IS THERE A BETTER WAY

The desired range of housing choice and the provision of neighbourhood commercial development is not comprehensively permissible within the R2 zone and is further limited by the minimum lot size restriction in accordance with the provisions of the DLEP 2011.

The submission of a PP to amend the existing zoning and lot size requirements represents the best method of achieving the desired outcome.

4.2 RELATIONSHIP TO STRATEGIC PLANNING FRAMEWORK

4.2.1 CONSISTENT WITH THE OBJECTIVES AND ACTIONS OF THE APPLICABLE REGIONAL OR SUB-REGIONAL STRATEGY

There are no overriding Regional or Sub-regional strategies that directly relate to the South East Urban Release Area and its future development within the Dubbo Regional LGA or Central West Region.

4.2.2 CONSISTENT WITH COUNCIL'S LOCAL STRATEGY OR OTHER LOCAL STRATEGIC PLAN

South-East Dubbo Residential Urban Release Area Stage 1 Structure Plan

As detailed within the Structure Plan this is the first component of a staged process that aims to ensure residential development opportunities continue to be delivered in Dubbo and in particular the South-East Residential Urban Release Area.

The role of the Plan is to set the overall direction for development in the South-East Residential Urban Release Area, inform land use decisions in the LEP and allow the developers of the Southlakes Estate to pursue a partial development of the Estate having regard to overall infrastructure and servicing constraints.

The objectives of the plan are to

- Identify the opportunities and constraints of the land and the anticipated needs of the community;
- Broadly indicate the likely future development potential of the study area;
- Enable the characteristics of the study area to determine the most appropriate location and form for development;
- Provide a broad context of the consideration, by Council, of individual rezoning submissions within the study area; and
- Establish a vision and set of development objectives which future development proposals will be required to meet;

The Plan provides forty (40) 'Strategic Residential Growth Principles' which have been considered during the preparation of this PP. The principles and a comment having regard to the PP is provided within the following table:

Strategic Residential Growth Principles	Comment
1. *Higher density residential development is encouraged at key locations in the Estate that ensure residents will have a high level of access to public transport, facilities, services and amenity;*	The intent of the allotment regime is to have higher densities located in close proximity to the Neighbourhood Centre and local collector roads of the estate.
2. Seniors housing is encouraged to be provided in locations and formats that provide for integration with residential neighbourhoods, areas of public open space and neighbourhood centre development;	The master plan details some larger parcels in close proximity to the neighbourhood centre and lake system would be suitable for this type of development
3. *Dual occupancy development is encouraged and promoted on land with an area greater than 900m^2 and a frontage of greater than 17m*	Noted.

4. *Dual occupancy development is specifically suited and encouraged as an efficient and effective urban design outcome for corner lots which allows each unit to have a separate frontage and address to a different street;*	Noted.
5. *Small format and small lot housing in the R1 general Residential zone should be provided with a zero lot line on one side boundary to encourage design quality and protect the amenity of residents;*	Noted.
6. *Council will prepare a Residential Design Guide for the use of the Dubbo Development Industry that will encourage site-responsive design and variety of housing offer;*	Noted.
7. *Where applicable and practicable, the provision of shop top housing is encouraged as a mechanism to further activate residential and commercial lands and add further variability in development types;*	The master plan details some larger parcels in close proximity to the neighbourhood centre and lake system would be suitable for this type of development
8. *Small format and integrated housing is encouraged where it can adequately mix with residential neighbourhoods and actively encourage social inclusion*	Noted.
9. *Any future amendment to the Dubbo local environmental plan 2011 to introduce a commercial zoning to facilitate a neighbourhood centre be required to include a maximum floor space limitation to limit the size and configuration of any commercial development to a neighbourhood scale*	The master plans Neighbourhood Centre would be developed and designed to service the needs and add to the amenity of the residents of the Southlakes whilst operating as a viable retail facility without detriment to the CBD of Dubbo and Orana Mall.
10. *Any Planning Proposal to introduce a commercial zone to allow for neighbourhood centre development will be required to provide an economic impact assessment which provides an assessment of such a proposal on the Dubbo Central District, the Orana Mall Market Place and other neighbourhood centres*	An economic impact assessment has been undertaken and is provided at Appendix B.
11. *A variety of access provisions are to be provided to the neighbourhood centre development including facilities for walking, cycling onsite public transport provision and suitable parking for private cars*	A variety of access provisions are provided to neighbourhood centre as it would be connected via walkway/cycleway through the lake system. Sufficient area would be provided on site for parking of vehicles and public transport services.
12. *Any neighbourhood centre development will be of a local scale which will not impact the residential amenity of development.*	Noted, preliminary concept facades are provided at Appendix A.
13. *Residential subdivision establishes a clear urban structure and hierarchy that promotes the creation of*	The master plans layout provides various links to the lakes system reserve through the estate which is

active neighbourhoods and encourages alternative forms of transport;	provided with footpaths and cycleways. The road system would be serviced with footpaths and cycleways along local collector roads linking all use areas within the estate.
14. *The natural attributes of the land should be used and reinforced in subdivision design through the placement of visible key landmark features such as parks and other focal points;*	Noted.
15. *The natural topography of the land shall be used in the design of residential subdivision. The natural site topography is an important design feature to add variation and interest to residential neighbourhoods.*	Noted.
16. *Residential subdivision shall optimise outlook and proximity to public community facilities*	Noted.
17. *Residential allotments shall be provided with a range of lot frontages which actively promotes streetscape variance and allow variation in the size and style of residential housing.*	The master plan has been designed to incorporate a range of lot frontages to assist the promotion of varied streetscapes
18. *Any residential subdivision should comply with the minimum internal connectivity index score of 1.3*	The master plan over both Stages 1 and 2 achieves a connectivity index of 1.3.
19. *Residential development shall not be provided backing onto areas of open space and should be separated by a road or other key access point unless the development provides a suitable level of access to open space areas in accordance with the requirements of Western Plains Regional Council, has open and transparent fencing and promotes living areas fronting open space.*	The master plan details allotments backing onto open space areas of which these lots would be provided with open and transparent fencing and would promote living areas overlooking the public open space.
20. *Any embellishment of current or future lands for the purposes of public open space over and above the requirements of the Dubbo Section 94 Contributions Plan – Open Space and Recreation Facilities shall be at the cost of the developer.*	Noted.
21. *Any developer undertaking embellishment in accordance with Strategic Growth principle 20 shall be required to enter into an appropriate agreement/s with Council in respect of long term maintenance.*	Noted.
22. *Public access and movement shall be maintained across and throughout areas of public open space.*	The master plan includes a footpath and cycleway plan through the public open space.
23. *In any situation where an allotment may have one of its boundaries to public open space, any fencing of this boundary shall be of an open and transparent nature.*	Fencing adjoining the public open space area would be of an open and transparent nature ensured through covenants upon title and guided through development controls within the DCP.

24. *The pedestrian and cycleway shall maintain legibility and ease of access to promote safe walking and cycling*	Noted.
25. *Not existent*	Noted.
26. *New growth areas have a variety of destinations within walking or cycling distance and the density of residential development supports the provision of required infrastructure.*	The masterplan provides a connection to all use areas within the estate.
27. *A movement network is created of streets with bicycle lanes that allows the safe interaction and movement for all road users.*	The master plan includes a bicycle network through the estate integrated with the road design.
28. *Major public transport access is provided throughout the land including connections to the Dubbo Central Business District;*	The master plan details suitable connections both existing and new via local collector roads throughout the estate and ultimately to the Dubbo CBD.
29. *A hierarchy of interconnected streets is established that gives safe, convenient and clear access points within and beyond individual subdivisions in the subject area;*	The master plan and supporting traffic study provides a safe and convenient street layout through the site and to adjoining land.
30. *The design of access and movement systems in the area ensures environmental impacts associated with groundwater and salinity are avoided or minimised;*	Noted.
31. *The access and movement system shall ensure the design of future subdivisions provides for energy efficient lot layouts and building orientation.*	The master plan provides a lot layout that has regard to topographical features and their influence upon required supporting infrastructure whilst also trying to achieve an energy efficient lot layout.
32. *Dubbo is maintained as a 10-minute city.*	The traffic study identifies service levels of key intersections to be of levels A and B demonstrating the efficiency of the surrounding road network.
33. *Based on the information included in Figure 20, the balance of the Hillview land (Southlakes Estate) shall only be developed to the location as shown in Figure 20. Land situated in the Stage 2 Structure plan area will require the preparation of an Infrastructure and Servicing Strategy for the overall land area.*	The proposed master plan excludes Stage 2 land. A master planned lay out is provided under separate cover to demonstrate the PP's lot layour would be able to comply with a 1.3 ICI and enable the location of the Southern Distributor with flood prone land.
34. *The Infrastructure and Servicing Strategy referred to in Principle 33 above shall be prepared by the owners of the subject lands.*	This is provided at Appendix C.

35. *The Cardno Keswick Drainage Review, August 2010 (Report No. W4823-1) is the adopted strategy for the provision of stormwater infrastructure to service the subject lands. Any developer seeking a variance to the regime included in the Strategy shall be required to prepare an independent stormwater drainage strategy that can detail how the projected stormwater volumes can be managed on the subject lands and through to receiving waters. Council is under no specific requirement to approve any alternative stormwater drainage strategy.*	Stormwater management is provided within the Appendix C.
36. *Any future site specific Development Control plan for the Southlakes lands shall be required to include a detailed section providing overall infrastructure principles and information explaining how residential development is proposed to be serviced in accordance with Councils adopted policies, plans and practices.*	Noted. The provisions of the existing Dubbo DCP would be transposed for future development.
37. *Land degradation and clearing is minimised and natural assets are maintained or enhanced.*	Noted.
38. *Development meets the 'improve or maintain test' by avoiding impacts to areas of high conservation value and providing offsets for unavoidable impacts.*	The site does not comprise areas of high ecological conservation value refer to Appendix F.
39. *Any future development application for subdivision across the subject site will provide a detailed and comprehensive Salinity Study and Salinity and Groundwater Management Plan.*	Already, assessed and provided at Appendix D.
40. *The Fuzzy Box Woodland Endangered Ecological Community contained in Keswick shall be protected from development and enhanced with further plantings and an appropriate management and maintenance regime.*	The site is not located within 'Keswick' and does not comprise areas of high ecological conservation value refer to Appendix F.

Having regard to the above consideration of the Structure Plans Strategic Residential Growth Principles the master plan and supporting reports are considered to be consistent with those of Structure Plan 1.

Dubbo City Urban Development Strategy - Residential Areas Development Strategy 1996-2015

The purpose of the Dubbo City Residential Areas Development Strategy 1996-2015 (Strategy) is *"to provide a spatial, servicing and development control framework that will assure the timely provision of residential development opportunities which fit the needs of Dubbo and the region it services"*. The Strategy was designed to provide land for future residential development and to facilitate the servicing, staging, and release of this land.

The Strategy divides the Dubbo LGA into thirteen (13) separate precincts including seven urban precincts. The subject site falls within the 'South East Precinct'. The Strategy sets a goal to *'Identify and protect the established residential neighbourhoods and ensure a sufficient supply of suitable land to meet the future residential development needs of the city.'* The strategy also recognises this precinct as being very significant to Dubbo due to the precinct being the last extensive area for prospective residential development east of the Macquarie River.

The proposed rezoning would be consistent with the strategy for the following reasons:

- An amended R1 and R2 zone and minimum lot size distribution would facilitate the timely provision of residential development that fits the current needs of Dubbo and the region it services;

- The intent of the PP is to meet the residential housing choice needs of Dubbo;
- The intent of the PP is to ensure a neighbourhood centre and community would be established;
- Development of this allotment would continue to complete the eastward phase of suburban development of Dubbo as the market changes and progresses;
- The sites are located within the visible transition/eastern edge of urban development, being the Sheraton Road and Hennessy Road corridors;
- The future construction and the resultant development would have due consideration to the local environmental constraints;
- It is anticipated that the PP would ensure the Dubbo Construction & Development Industry and the Dubbo Real Estate Industry would be provided with a secure and diverse residential and additional commercial land supply that is anticipated to last beyond 5 years;

Dubbo City Planning & Transportation Strategy 2036

The Dubbo City Planning and Transportation Strategy 2036 has been designed to provide guidance regarding the construction of roads and pedestrian pathways in Dubbo City. The 'Context' of the Plan states that the Strategy is to be considered in future strategic land use planning decisions.

The 'Context' also states that the Strategy does not represent the adopted Strategic Land Use Policy for the City and its future growth. In this regard, and due to the fact that the land is located within an expanding part of the residential area of Dubbo, the PP is considered to be generally accommodated within the scheduling, expectations and recommendations of this strategy.

It should be noted that the strategy makes the following statements to which the PP is considered to remain consistent:

"Residential Development in Dubbo is planned in three sectors, the South East Sector, the North West Sector and the South West Sector.

The Density of existing residential areas is approximately 7.8 dwellings per hectare; this is a gross figure including roads, schools and local community facilities including open space.

Should development continue at this density, the three sectors could accommodate 10,500 dwellings, sufficient until about 2050.

The scheduling for the three sectors if described in Table 2.1 and the location is described in Figure 5.1. …"

4.2.3 CONSISTENT WITH APPLICABLE STATE ENVIRONMENTAL PLANNING POLICIES

State Environmental Planning Policy No. 21 – Caravan Parks

The change in zoning would enable 'manufactured home estate' development as caravan parks are a permitted use within the R1 land use table subject to development consent being granted. If the land were to be developed in this manner such development would be required to ensure it achieves the relevant provisions of this plan. The PP does not include provisions that contradict or hinder the application of this policy. It is not the development intention of these sites to the developed as a caravan park.

State Environmental Planning Policy No. 36 – Manufactured Home Estates

The change in zoning would enable 'manufactured home estate' development as caravan parks are a permitted use within the R1 land use table subject to development consent being granted. If the land were to be developed in this manner such development would be required to ensure it achieves the relevant provisions of this plan. The PP does not include provisions that contradict or hinder the application of this policy.

State Environmental Planning Policy No. 44 – Koala Habitat Protection

An Ecological Assessment provided at Appendix E has been prepared which assesses the impact of the proposal upon ecological communities and or their habitats.

The report concluded that the proposed activity should not be considered to constitute a significant impact and, as such, no Species Impact Statement (SIS) is warranted and no Koala Habitat Management Plan pursuant to SEPP 44 should be required. In this respect the suitability of this site for residential and commercial purposes is considered suitable.

State Environmental Planning Policy No. 55 – Remediation of Land

Clause 6 of the *State Environmental Planning Policy No. 55 – Remediation of Land* requires the issue of contamination and remediation to be considered in zoning or rezoning proposals. A contamination investigation has been prepared for the subject land which found the land to be suitable for its intended development. In this respect the suitability of this site for residential and commercial purposes is considered suitable.

State Environmental Planning Policy No. 64 – Advertising and Signage

The change in zoning would enable limited business uses subject to development consent form Council. If signage were to form part of a future development application the provisions of *State Environmental Planning Policy No. 64 – Advertising and Signage* would apply and the development would need to ensure the relevant provisions of the policy are achieved. The PP does not include provisions that contradict or hinder the application of this policy.

State Environmental Planning Policy No 65 – Design Quality of Residential Flat Development

The change in zoning would enable 'Residential Flat Buildings' and 'Shop Top Housing' development of the land subject to development consent being granted. If the land were to be developed in this manner such development would need to ensure it achieves the relevant provisions of this plan. The PP does not include provisions that contradict or hinder the application of this policy.

State Environmental Planning Policy (Affordable Rental Housing) 2009

The provisions of *State Environmental Planning Policy (Affordable Rental Housing) 2009* would continue to apply to the land with future development under this plan being subject to development consent being granted. If the land were to be developed in this manner such development would need to ensure it achieves the relevant provisions of this plan. The PP does not include provisions that contradict or hinder the application of this policy.

State Environmental Planning Policy (Building Sustainability Index: BASIX) 2004

The provisions of *State Environmental Planning Policy (Building Sustainability Index: BASIX) 2004* would continue to apply to residential affected development in accordance with the provisions of this policy. The PP does not include provisions that contradict or hinder the application of this policy.

State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004

The provisions of *State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004* would continue to apply to the land with future development under this plan being subject to development consent being granted. If the land were to be developed in this manner such development would need to ensure it achieves the relevant provisions of this plan. The PP does not include provisions that contradict or hinder the application of this policy.

State Environmental Planning Policy (Exempt and Complying Development Codes) 2008

The provisions of *State Environmental Planning Policy (Exempt and Complying Development Codes) 2008* would continue to apply to the land generally consistent with that achievable under the current land zoning. The PP does not include provisions that contradict or hinder the application of this policy.

State Environmental Planning Policy (Infrastructure) 2007

The provisions of *State Environmental Planning Policy (Infrastructure) 2007* would continue to apply consistent with that achievable under the current zoning. The PP does not include provisions that contradict or hinder the application of this policy.

State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007

The site is not located within any identified resource areas, potential resource areas or transitional areas. There are no known existing mines, petroleum production operations or extractive industries are in the area of the PP or within its vicinity. Given existing development on the site and within the immediate locality the PP would be of minor significance and would not further restrict development potential or create land use conflict beyond existing arrangements.

4.2.4 CONSISTENT WITH APPLICABLE S117 (2) MINISTERIAL DIRECTIONS – 3.1 RESIDENTIAL ZONES

The Minister for Planning and Infrastructure, under Section 117(2) of the EP&A Act 1979 issues directions that local Councils must follow when preparing PP's for new Local Environmental Plans. The directions cover the following broad categories:

1. Employment and Resources
2. Environment and Heritage
3. Housing, Infrastructure and Urban Development
4. Hazard and Risk
5. Regional Planning
6. Local Plan Making

The following section provides an assessment of the PP against the relevant Section 117 directions. Note this section provides the objectives of the relevant direction, a full copy of the directions can be viewed at:

http://www.planning.nsw.gov.au/planningsystem/local.asp.

The following discussion demonstrates the PP's consistency with the relevant Section 117 directions.

Direction 1.1 – Business and Industrial Zones

Ministerial Direction 1.1 – Business and Industrial Zones is applicable as the PP would rezone land for local employment opportunities. The objectives of this direction are to encourage employment growth in suitable locations, protect employment land in business and industrial zones and support the viability of identified strategic centres.

The PP is supported by an economic impact assessment prepared by MacroPlan Dimasi provided at Appendix B and demonstrates that the proposed commercial area would encourage employment growth, not result in adverse impact upon the commercial viability of the Dubbo CBD and Orana Mall and protect existing employment lands of Dubbo.

Direction 1.3 – Mining, Petroleum Production and Extractive Industries

Ministerial Direction 1.3 – Mining, Petroleum Production and Extractive Industries is not applicable as the PP affected land does not prohibit the mining of coal or other minerals, production of petroleum, or winning or obtaining of extractive materials or restricting the potential development of such by permitting a land use that is likely to be incompatible with such development.

It is noted that the sites are currently zoned for residential use and are provided with a buffer of existing residentially zoned land.

Direction 2.1 – Environment Protection Zones

Ministerial Direction 2.1 – Environment Protection Zones does apply to the PP as The Keswick on the Park Estate is mapped by the DLEP 2012 Natural Resource Biodiversity Map NRB_008 as being of 'high' biodiversity significance. The area is known to contain an Endangered Ecological Community (EEC). The site is currently vacant of any vegetation and is currently being constructed for low density residential dwellings. The PP is not considered to adversely affect the EEC.

Direction 2.3 – Heritage Conservation

Ministerial Direction 2.3 – Heritage Conservation is applicable as the PP affected land includes items, areas, objects and places of environmental heritage significance and indigenous heritage significance.

The PP is considered consistent with the objectives of this direction as the existing identified heritage items and the relevant development considerations of the DLEP would remain unaffected by the PP. all future development would require due consideration in accordance with these provisions.

Direction 3.1 – Residential Zones

Ministerial Direction 3.1 – Residential Zones is applicable as the PP proposes to redistribute the residential zones across the site.

The PP is considered consistent with the objectives of this direction as the redistributed rezoning and amended minimum lot sizes;

- Would encourage a variety and choice of housing types to provide for the existing and future housing needs of Dubbo;
- Would make more efficient use of existing and future infrastructure and services of Dubbo;
- Would reduce the consumption of land for housing and associated urban development on the fringe of Dubbo; and
- It is anticipated that future development would be of 'good design' having regard to current modern housing and infrastructure development and construction requirements.

As stated above the PP is located in an area that contains adequate access to services such as sewerage, and water as well as public transport facilities. The future development of the site would make efficient use of these existing services and would reduce the need for additional development to take place upon the urban fringe of Dubbo.

Direction 3.3 – Home Occupations

Ministerial Direction 3.3 – Home Occupations is applicable as the proposed R1 General Residential zone permits dwelling houses. The objective of this direction is to encourage the carrying out of low-impact small business in dwelling houses The PP maintains existing provisions that enable 'home occupations' to be carried out without the need of development consent.

Direction 3.4 – Integrating Land Use and Public Transport

Ministerial Direction 3.4 – Integrating Land Use and Public Transport is applicable as the PP would rezone land for urban residential purposes.

In accordance with the following, the rezoning of the subject site for urban residential purposes must be consistent with the aims and objectives of the following documents.

"A planning proposal must locate zones for urban purposes and include provisions that give effect to and are consistent with the aims, objectives and principles of:

(a) Improving Transport Choice – Guidelines for planning and development (DUAP 2001), and

(b) The Right Place for Business and Services – Planning Policy (DUAP 2001)".

With reference to the abovementioned documents, future occupants of each estate would have access to existing and planned public transport nodes which would traverse these sites and South East Dubbo.

The provision of dwelling house developments in a location serviced by public transport is imperative as future residents would use such services as one of their main means of transportation around Dubbo.

The development of these sites as opposed to other sites in the LGA would negate the need for new transport routes such as new bus routes and road facilities on the urban fringe.

Direction 4.3 – Flood Prone Land

Ministerial Direction 4.3 – Flood Prone Land is not applicable as the PP affected land as detailed upon plans prepared by Geolyse Pty ltd numbered 114135_19B_TP02 and TP04 is not identified as flood prone land by the LEP.

Consideration of future development within the flood prone land would be provided as part of Structure Plan 2. Due diligence reports have been prepared and will be provided under separate cover to assist consideration.

Direction 6.1 – Approval and Referral Requirements

Ministerial Direction 6.1 – Approval and Referral Requirements applies to all Planning Proposals forwarded for Gateway Determination by a local authority.

The proposed rezoning does not include provisions that would trigger a need for concurrence, consultation, or referral to the State Government.

Direction 6.2 – Reserving Land for Public Purposes

Ministerial Direction 6.2 – Reserving Land for Public Purposes applies as this PP would realign and rezone land for public recreation purposes. The objectives of this direction are simply to facilitate the provision of public services and facilities by reserving land for public purposes and to facilitate the removal of reservations of land for public purposes where the land is no longer required for acquisition.

The PP would result in additional land being provided to the public for recreation purposes as a result of the realigned dual public use stormwater channel design accommodating stormwater from the site and upstream catchments (and incorporating suitable freeboard to residential land) and the recreation needs i.e. cycleways, playground and landscaped areas for use by the general public. This recreation land would also provide excellent connectivity through the estate without the need to traverse numerous traffic intersections and other pedestrian hazard areas.

Direction 6.3 – Site Specific Provisions

Ministerial Direction 6.3 – Site Specific Provisions applies to all Planning Proposals forwarded for Gateway Determination by a local authority.

The PP does not propose to create any site specific development standards in addition to those currently within the principal environmental planning instrument other than to also provide a minimum allotment size of 600m^2 consistent with surrounding R2 zoned land and no minimum allotment size for R1 zoned land, that is consistent with other R1 zoned land within Dubbo.

4.3 ENVIRONMENTAL, SOCIAL AND ECONOMIC IMPACTS

4.3.1 IS THERE ANY LIKELIHOOD THAT CRITICAL HABITAT OR THREATENED SPECIES, POPULATIONS OR ECOLOGICAL COMMUNITIES, OR THEIR HABITATS, WILL BE ADVERSELY AFFECTED AS A RESULT OF THE PROPOSAL?

The land is mapped by the LEP 2012 Natural Resource Biodiversity Map Groundwater Vulnerability Map – Sheet CL_008 as being of 'Moderately High Vulnerability'. The development intention for this land is for residential development with supporting neighbourhood centre development and road and stormwater management infrastructure. The resultant development would manage stormwater collection and disposal in a controlled and engineered fashion in accordance with relevant experts' advice and recommendations reducing the threat to groundwater.

An Ecological Assessment provided at Appendix E has been prepared which assesses the impact of the proposal upon ecological communities and or their habitats.

No known threatened species or ecological communities have been identified as being currently present on these sites. The study identified that the that the vegetation noted upon the site is likely to have been derived from one of the three EECs listed under the TSC Act. In accordance with the TSC Act the 'precautionary principle' has been adopted and an Assessment of Significance has been completed for each to characterise the potential impacts.

Assessments of significance are included within the supporting ecological assessment and having given consideration to the ecology within the subject site, the report concludes the Proposal is:

- Unlikely to significantly affect any of the listed threatened species, fauna populations or communities.
- Unlikely to augment or significantly contribute to any of the National or State listed Key Threatening Processes, if the appropriate safeguards regarding the control of potential vertebrate pests are effectively applied.
- Unlikely to significantly affect any RAMSAR wetland or CAMBA, ROKAMBA or JAMBA listed species;
- Unlikely to significantly affect local hydrology.
- Consistent with ESD principles with regard to fauna, would not adversely affect the local biodiversity and no issue of intergenerational or value added matters are relevant in this instance.

The report concluded that the proposed activity should not be considered to constitute a significant impact and, as such, no Species Impact Statement (SIS) is warranted. No Koala Habitat Management Plan pursuant to SEPP 44 should be required.

The PP does not affect the existing DLEP 2012 'Additional Local Provisions' for consideration of Natural Resource – biodiversity and Groundwater vulnerability.

4.3.2 ARE THERE ANY OTHER LIKELY ENVIRONMENTAL EFFECTS AS A RESULT OF THE PLANNING PROPOSAL AND HOW ARE THEY PROPOSED TO BE MANAGED?

The parcels of land proposed for rezoning largely consist of vacant grassland of no particular environmental value. No known threatened species or ecological communities are present on each site.

The PP does not propose to amend the flood prone land of the Eulomogo Creek in the south east extent of the site and does not proposed to impact by way of earthworks or road corridors within 80m of the existing creek line.

Any future development of these areas would require due consideration of relevant environmental impacts be undertaken during a development application if Council required assurance whether the land is suitable for the proposed use.

4.3.3 HAS THE PLANNING PROPOSAL ADEQUATELY ADDRESSED ANY SOCIAL AND ECONOMIC EFFECTS?

Due to the site's location within a residential area, the land has adequate access to public transport and due to its location to the Dubbo CBD and the Orana Mall, it is anticipated that a future property owners would be within a reasonable vicinity of any required medical, educational, and retail services and facilities along with all transport means, including trains, coaches and planes to neighbouring towns and cities.

Additionally, with the inclusion of the proposed Neighbourhood Centre zone it is anticipated that future residents would be within a reasonable distance of future permissible medical and retail services and facilities should they occupy this site once developed.

The PP is supported by an economic impact assessment prepared by MacroPlan Dimasi provided at Appendix B and demonstrates that the proposed commercial area would encourage employment growth, not result in adverse impact upon the commercial viability of the Dubbo CBD and Orana Mall and protect existing employment lands of Dubbo.

4.4 STATE AND COMMONWEALTH INTERESTS

4.4.1 ADEQUATE PUBLIC INFRASTRUCTURE FOR PROPOSAL?

Adequate public infrastructure would be available to all future allotments. The lots would have the capacity to be serviced by sewer, water, and stormwater infrastructure and would each be connected to electricity and telecommunications infrastructure from the surrounding existing service mains designed and installed to service the development of these estates.

As detailed above the land would enjoy reasonable access to public transport and are within close proximity of any required medical, educational, and retail services and facilities and all transport means, including trains, coaches and planes to neighbouring towns and cities.

4.4.2 VIEWS OF STATE/COMMONWEALTH PUBLIC AUTHORITIES CONSULTED IN ACCORDANCE WITH THE GATEWAY DETERMINATION?

The views of state and commonwealth public authorities would be ascertained during the formal course of this PP in accordance with the comments contained in the future Gateway Determination.

Required Instrument Amendments

5.1 AMENDED MAPPING REQUIRED

The following DLEP maps would be amended as part of the PP;

- Land Zoning Map LZN_008B of the DLEP 2011 with regard to the new R1 – General Residential and B1 Neighbourhood Centre zoned land and the amended R2 – Low Density Residential and amended RE1 – Public Recreation a zoned land as shown upon supporting plan **114135_19D_TP02 prepared by Geolyse Pty Ltd**; and
- Lot Size Map LSZ_008B of the DLEP 2011 with regard to the new R1 General Residential and B1 Neighbourhood Centre zoned land and the amended R2 – Low Density Residential zoned land. In particular the amended minimum lot sizes would be as show upon supporting plan **114150_19D_TP04 prepared by Geolyse Pty Ltd.**

The following clauses and schedules of the DLEP would be amended as part of the PP;

- Part 7 Additional Local Provisions clause 7.12 Shops in Zone B1 Neighbourhood Centre by amending subclause (2) to allow Council to grant consent to retail development that would exceed 1,000 square meters where such development maintains the objective of Clause 7.12 being to maintain the commercial hierarchy of Dubbo by encouraging retail development of an appropriate scale within neighbourhood centres. Suggested amended wording is provided as follows:

(2) Development for the purposes of retail premises on land within Zone B1 Neighbourhood Centre that exceeds 1,000 square meters of Gross Floor Area may be carried out but only with development consent.

- Schedule 1 Additional Permitted Uses. In particular the inclusion of an additional use within the proposed B1 zone located upon Boundary Road bounded by Sheraton Road to the east and Wheelers Lane to the west being development for the purposes of recreation facility (indoor);

Community Consultation

6.1 TYPE OF COMMUNITY CONSULTATION REQUIRED

Section 5.5.2 of 'A Guide to Preparing Local Environmental Plans' identifies two different exhibition periods for community consultation;

- Low Impact Proposals – 14 days; and
- All other Planning Proposals (including any proposal to reclassify land) – 28 days.

The Guide describes Low Impact Proposals as having the following attributes;

- *A 'low' impact planning proposal is a planning proposal that, in the opinion of the person making the gateway determination, is;*
    - o *Consistent with the pattern of surrounding land use zones and/or land uses;*

The proposed amendments to the zoning and minimum lot sizes of these site generally accords with Council's local strategies and policies as detailed above and would be consistent with other R1, R2, B1 and RE1 zoned land within Dubbo and the immediate locality.

- o *Consistent with the strategic planning framework;*

Responses have been provided within section 4.2 of this report detailing the proposal's compliance with relevant local, regional and state planning strategies, policies, and ministerial directions.

- o *Presents no issues with regard to infrastructure servicing;*

The future residential development of these sites would have access to sewer, water, and stormwater services, and would be connected with electricity and telecommunications facilities.

- o *Not a principle LEP; and*

Not relevant.

- o *Does not reclassify public land.*

The PP does not seek to reclassify existing public land.

In accordance with the responses to the above 'Low Impact Proposals' guide, the PP is considered to be of low impact as it does not seek to reclassify land and is considered generally consistent with the Southlakes Structure Plan, the objectives of the LEP and the EP & A Act. Respectfully, it is therefore requested that a community consultation period of 14 days be applied to the exhibition of this PP.

Reference s

Morgan and Terrey. 1992, Nature Conservation in Western New South Wales. National Park Association, Sydney.

NSW Department of Planning (DoP). 2009a, A Guide to Preparing Local Environmental Plans, DoP, Sydney.

NSW Department of Planning (DoP). 2009a, A Guide to Preparing Planning Proposals, DoP, Sydney.

Section 117 Directions Issued by the Minister for Planning dated 1 July 2009 updated 14 April 2016

Drawings

Appendix A

EXAMPLE CONCEPT DESIGNS

Shallow lake with adjoining public reserve area.

Landscaped gardens and reserve furniture within reserve area.

Landscaped lake system with meandering footpaths and cycleway

Detached Dwellings backing onto the lake system with transparent fencing

Potential Dual Occupancy Development

Master Planned community with local through roads / access ways

Master Planned community with local through roads directly connected to bushland reserves

Master Planned community with local loop road, central community facilities and open space areas

Attached and multi-unit dwellings fronting community facilities and open space areas

Attached dwellings fronting landscaped pathways through the subdivision

Internal community facilities adjoining residential dwellings.

Internal landscaped areas adjoining residential dwellings.

Landscaped entrance to a Master Planned community delineating between the local road and community areas.

Envisaged Typical Neighbourhood Centre Facades and Street Presentation

Appendix B

ECONOMIC IMPACT ASSESSMENT

Prepared by MacroPlanDimasi

October 2016

Appendix C

SERVICING STRATEGY & TRAFFIC STUDY

All prepared by Geolyse Pty Ltd

August & September 2016

Appendix D

GROUNDWATER AND SALINITY STUDY

Prepared by Envirowest Consulting Pty Ltd

September 2016

Appendix E

ECOLOGICAL ASSESSMENT

Prepared by Ozark Environmental & Heritage Management Pty Ltd

May 2015

Appendix F

CONTAMINATION INVESTIGATION STUDY

Prepared by Envirowest Consulting Pty Ltd

September 2016

Appendix G

ABORIGINAL ARCHAEOLOGICAL ASSESSMENT

Prepared by Ozark Environmental & Heritage Management Pty Ltd

June 2015

Overview of the north bank of Eulomogo Creek, facing west.

ABORIGINAL DUE DILIGENCE ARCHAEOLOGICAL ASSESSMENT

Subdivision of Lot 2 DP880413
Sheraton Road, Dubbo NSW
Dubbo Regional LGA
March 2017

Report Prepared by

OzArk Environmental & Heritage Management Pty Ltd

For

MAAS Group Properties

Environmental and Heritage Management P/L

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Client	MAAS Group Properties		
Project No / Purchase Order No			
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	Name	**Signed**	**Date**
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Clients Representative Managing this Document		**OzArk Person(s) Managing this Document**	
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Acknowledgement

OzArk acknowledge Traditional Owners of the area on which this assessment took place and pay respect to their beliefs, cultural heritage and continuing connection with the land. We also acknowledge and pay respect to the post-contact experiences of Aboriginal people with attachment to the area and to the elders, past and present, as the next generation of role models and vessels for memories, traditions, culture and hopes of local Aboriginal people.

EXECUTIVE SUMMARY

OzArk Environmental & Heritage Management was engaged by MAAS Group Properties to complete an Aboriginal Due Diligence archaeological assessment for the proposed subdivision of Lot 2 DP880413 at 24R Sheraton Road, Dubbo NSW. Lot 2 DP880413 was previously assessed by Kelton (1995) who recorded two Aboriginal sites in the southern portion of the Study Area and one Aboriginal site 20 metres south of the Study Area adjacent to Eulomogo Creek.

A visual inspection of the Study Area was undertaken by OzArk Senior Archaeologist, Dr Chris Lovell, on Thursday 19 January 2017. One new site was recorded during the inspection (Hillview-IF1) and the three Aboriginal sites previously recorded by Kelton (1995) were assessed. No artefacts were identified at the previously recorded site locations; however, this was due to low ground surface visibility and the artefacts are likely to exist at the site locations. Two of the site locations (AHIMS ##36-1-0186 and #36-1-0188) were confirmed as being within the Study Area and one site location (AHIMS #36-1-0187) was confirmed as being 20 metres south of the Study Area southern boundary. An area of potential archaeological sensitivity (PAS) was identified in the southern portion of the Study Area, encompassing the Eulomogo Creek banks, the banks of an unnamed drainage line in the vicinity of #36-1-0188, and the creek flat to the south of Eulomogo Creek.

The Due Diligence archaeological assessment concluded that Aboriginal objects or intact archaeological deposits are likely to be harmed by the Proposal. This moves the Proposal to the following outcome: 'further investigation and impact assessment' of the Study Area must be undertaken. To ensure that the Aboriginal cultural heritage values of the Study Area are protected, the following recommendations are made:

1. Further investigation and impact assessment of the Study Area must be undertaken, including the preparation of an Aboriginal Cultural Heritage Assessment Report (ACHAR), following the *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (DECCW 2010a) and adhering to the *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW 2010b; Code of Practice). If this assessment concludes that harm to Aboriginal objects will occur, then an Aboriginal Heritage Impact Permit (AHIP) application must be made.
2. Ground disturbing activities must not occur within the riparian zone or within the Study Area boundaries south of Eulomogo Creek. This will avoid harm to AHIMS #36-1-0186 and most of the area of PAS (**Figure 3-8**). Due to the close proximity to the Study Area, management of AHIMS #36-1-0187 may also be required during the proposed work to avoid inadvertently harming the site.
3. The establishment of a riparian zone has not avoided ground disturbing activities within the updated AHIMS #36-1-0188 site extent and potential archaeological deposit (PAD)

area (**Figure 3-6**) or within the northeast portion of the area of PAS (**Figure 3-8**). If ground disturbing work cannot be avoided in this area, test excavations in accordance with the Code of Practice will be required to establish whether an archaeological deposit exists in this area, with the results reported in an Archaeological Assessment Report or included in the ACHAR. Surface salvage of previously recorded artefacts and, possibly, salvage excavations will subsequently be required under an AHIP.

4. Harm to Hillview-IF1 has not been avoided and therefore surface collection of the artefact will be required under an AHIP.

CONTENTS

FIGURES

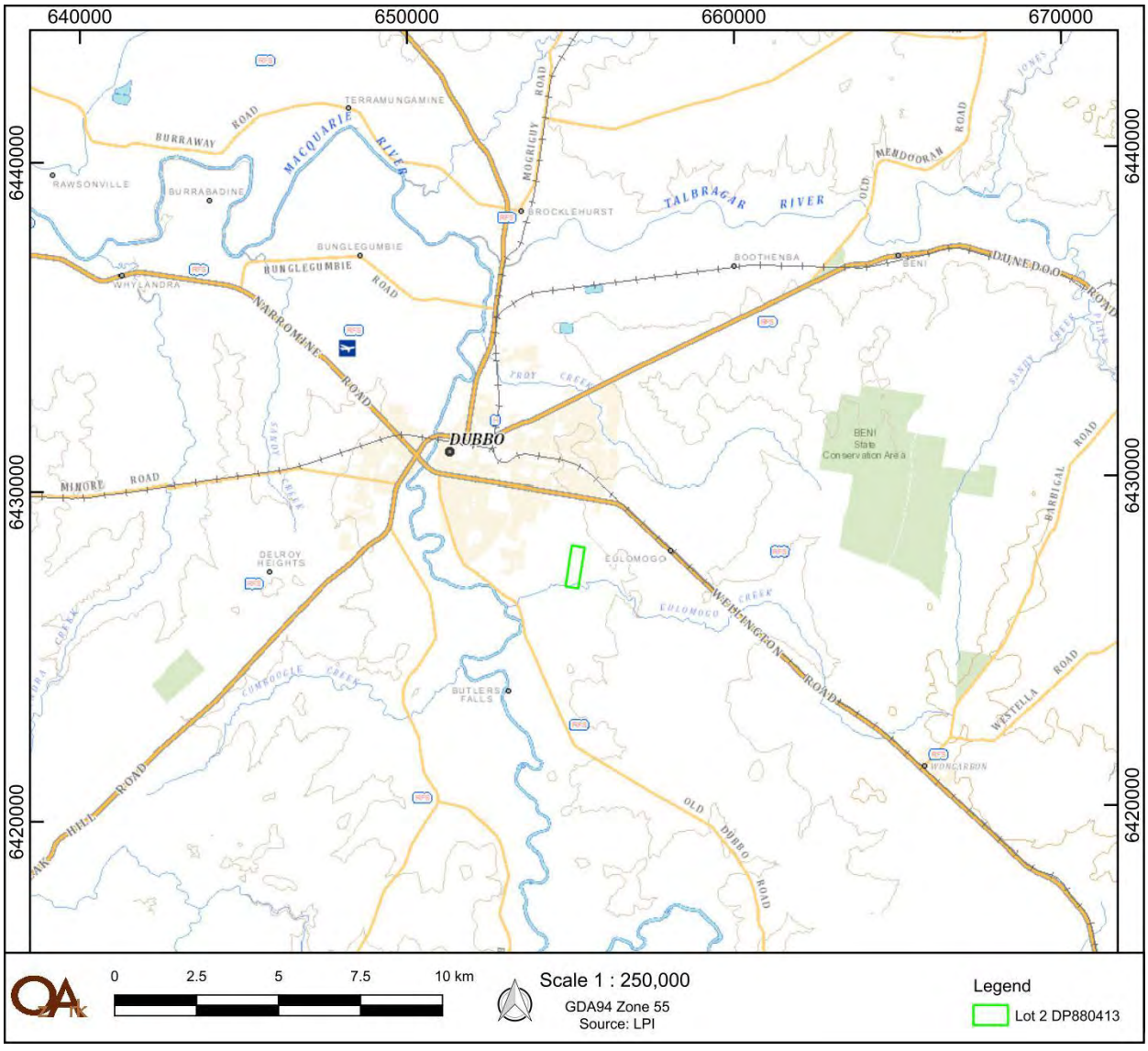
TABLES

1 INTRODUCTION

1.1 BRIEF DESCRIPTION OF THE PROPOSAL

OzArk Environmental & Heritage Management (OzArk) has been engaged by MAAS Group Properties (the Proponent) to complete an Aboriginal Due Diligence archaeological assessment for the proposed subdivision of Lot 2 DP880413 at 24R Sheraton Road, Dubbo NSW. This report examines proposed works associated with the subdivision of Lot 2 DP880413 (the Proposal). The Proposal is situated within the Dubbo Regional Local Government Area (LGA) (**Figure 1-1**).

Figure 1-1: Map showing the location of the Proposal in the region.



1.2 BACKGROUND

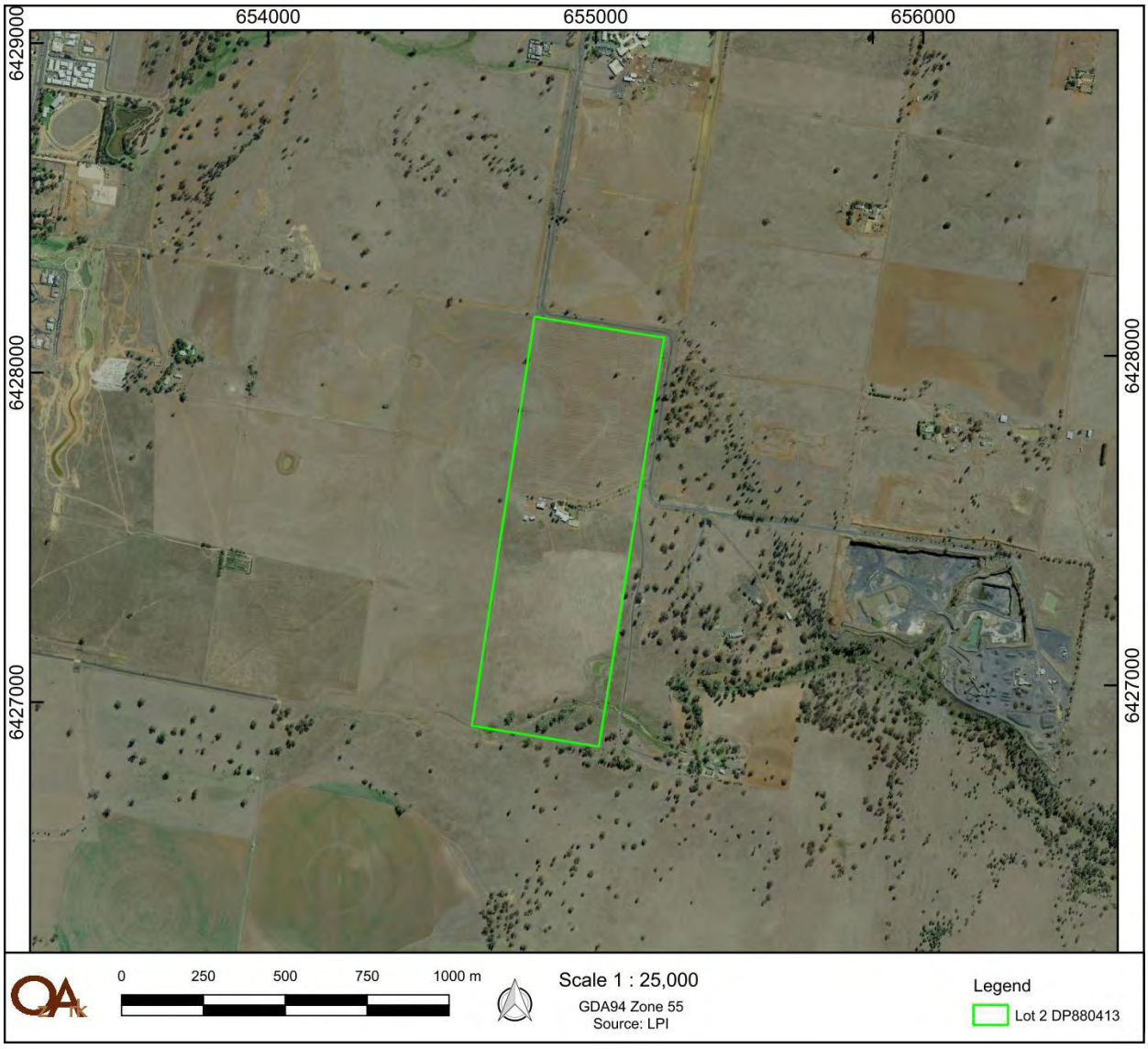
Lot 2 DP880413 was assessed by Kelton (1995) for the proposed 'Keswick' housing subdivision of 415 hectares of rural land located southeast of Dubbo and encompassing Lot 2 DP880413. The assessment included some consultation with Aboriginal community representatives, which included requests for information regarding the cultural significance of the development area and

briefings at the end of each field survey day. Discussions with Aboriginal community representatives did not suggest that the development area contained areas of Aboriginal cultural significance, except that parts of the area were located close to the Macquarie River. Lot 2 DP880413 is located at the eastern boundary of the Kelton (1995) development area, approximately two kilometres northeast of the Macquarie River. Seven sites were recorded by Kelton (1995) within the development area, two of which are located within Lot 2 DP880413. The results of the Kelton (1995) assessment and relevance to the current project are outlined in **Section 2.3.3** and **Section 3.2**.

1.3 STUDY AREA

The Study Area includes Lot 2 DP880413, encompassing approximately 51 hectares of land, located approximately 4.7 kilometres southeast of the Dubbo CBD at 24R Sheraton Road (**Figure 1-2**).

Figure 1-2: Map showing satellite imagery of the Study Area (Lot 2 DP880413).



1.4 ASSESSMENT APPROACH

The desktop and visual inspection component for the Study Area follows the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* (Due Diligence; DECCW 2010c).

2 DUE DILIGENCE ASSESSMENT

2.1 INTRODUCTION

The National Parks and Wildlife Regulation 2009 (NPW Regulation) made under the *National Parks and Wildlife Act 1974* advocates a Due Diligence process to determining likely impacts on Aboriginal objects. Carrying out Due Diligence provides a defence to the offence of harming Aboriginal objects and is an important step in satisfying Aboriginal heritage obligations in NSW.

2.2 DEFENCES UNDER THE NPW REGULATION 2009

2.2.1 Low Impact Activities

The first step before application of the Due Diligence process itself is to determine whether the proposed activity is a "low impact activity" for which there is a defence in the NPW Regulation. The exemptions are listed in Section 80B (1) of the NPW Regulation (DECCW 2010c: 6).

The activities of MAAS Group Properties are not an except 'low impact activity' listed in the NPW Regulation. Furthermore, this defence does not apply to situations where there is reason to suspect that an Aboriginal object may be present. The proposed work includes landforms that contain previously recorded Aboriginal sites (Kelton 1995), therefore the Due Diligence process must be applied.

2.2.2 Disturbed Lands

Relevant to this process is the assessed levels of previous land-use disturbance.

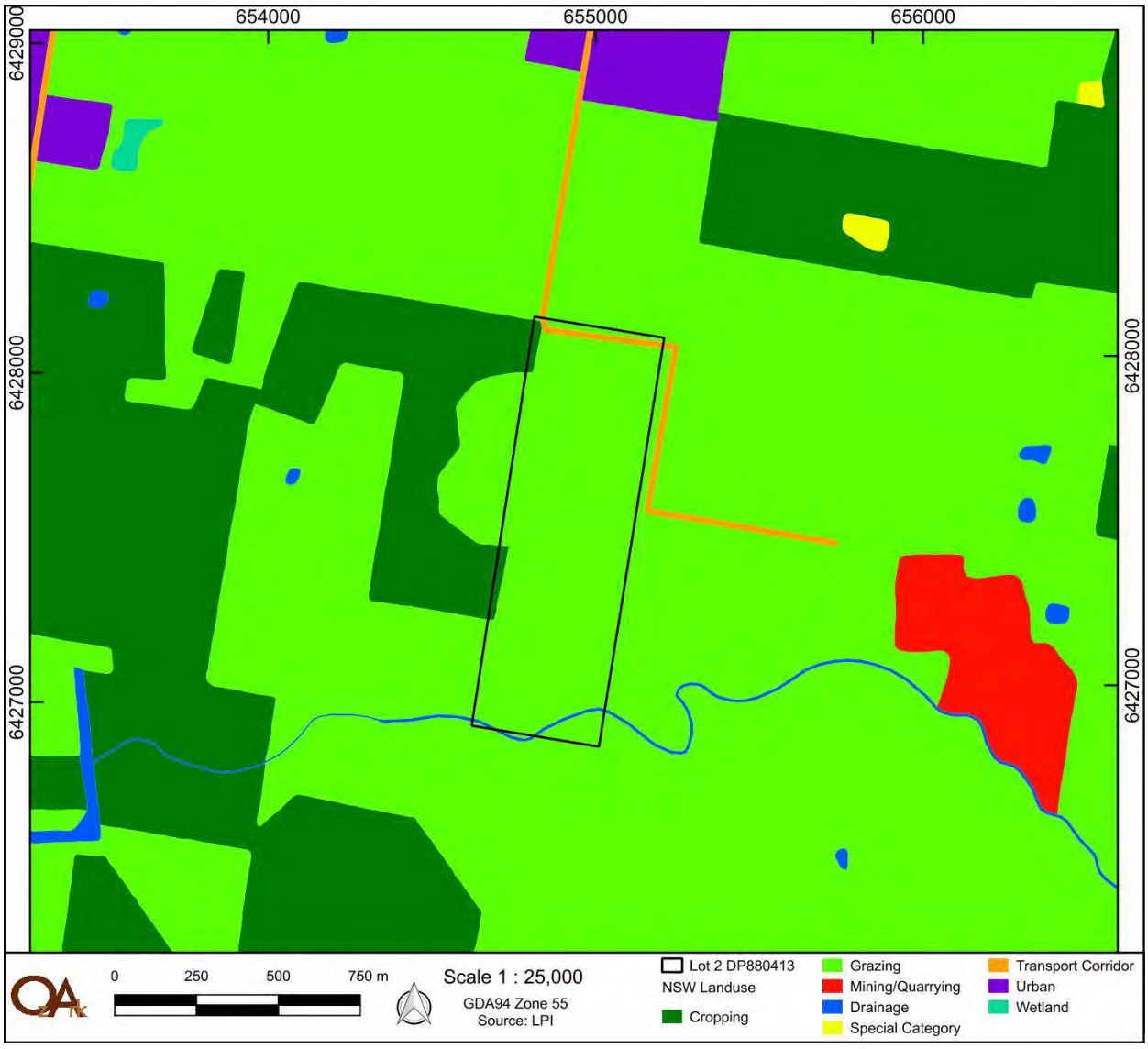
The NPW Regulation Section 80B (4) (DECCW 2010c: 18) define disturbed land as follows:

> *Land is disturbed if it has been the subject of a human activity that has changed the land's surface, being changes that remain clear and observable.*
>
> *Examples include ploughing, construction of rural infrastructure (such as dams and fences), construction of roads, trails and tracks (including fire trails and tracks and walking tracks), clearing vegetation, construction of buildings and the erection of other structures, construction or installation of utilities and other similar services (such as above or below ground electrical infrastructure, water or sewerage pipelines, stormwater drainage and other similar infrastructure) and construction of earthworks.*

Figure 2-1 shows land use in the vicinity of the Study Area. Examination of satellite imagery (**Figure 1-2**) and visual inspection of the Study Area confirmed that the area has been cleared of vegetation, although some remnant trees exist in the southern and south-eastern portion, adjacent to Eulomogo Creek. House, shed and driveway construction has occurred in the central parts of the Study Area (**Plate 9**). The Study

Area is composed of several fenced paddocks that have undergone prolonged grazing. Visual inspection confirmed that the large northern (**Plate 10**) and southern paddocks (**Plate 11**) have been ploughed. Two low voltage powerlines and an earthen dam have been constructed in the southeast corner of the Study Area. Most of the Study Area therefore falls under the NPW Regulation definition of 'disturbed land', with the exception perhaps of: a low hill along the north western boundary; some areas to the east and west of the house and sheds; and the south eastern parts of the Study Area in the vicinity of Eulomogo Creek. As such, some portions of the Study Area cannot be considered 'disturbed land' and therefore the Due Diligence process must be applied.

Figure 2-1: Map showing land use in the Study Area.



2.3 APPLICATION OF THE DUE DILIGENCE CODE OF PRACTICE TO THE PROPOSAL

To follow the generic Due Diligence process, a series of steps in a question/answer flowchart format (DECCW 2010c: 10) are applied to the proposed impacts and the Study Area, and the responses documented.

2.3.1 Step 1

Will the activity disturb the ground surface or any culturally modified trees?

Yes. The Proposal involves the subdivision of Lot 2 DP880413 in preparation for a future housing development (**Figure 2-2**). The subdivision of land is a local government administrative procedure that does not involve surface ground disturbance and will not affect any culturally modified trees. However, a housing development is proposed to occur after the subdivision is complete and this development will disturb the ground surface and could affect culturally modified trees, if present. This assessment takes into consideration the impacts of the subsequent housing development. A riparian zone has been established in the southern portion of the Study Area, including a 40 metre vegetated riparian buffer either side of Eulomogo Creek. No ground disturbing work is proposed in this area or south of Eulomogo Creek. A freight way is proposed to the north of the riparian zone (**Figure 2-2** and **Figure 2-3**).

Figure 2-2: Map showing the lot layout for the proposed subdivision within the Study Area (green dashed line).

Figure 2-3: Map showing the overall site plan within the Study Area (dashed green line) including the limits of the riparian zone along Eulomogo Creek and the proposed freight way.

2.3.2 Step 2 a)

Are there any relevant confirmed site records or other associated landscape feature information on AHIMS?

Yes. A search of the Office of Environment and Heritage (OEH) administered Aboriginal Heritage Information Management System (AHIMS) database was conducted on 12 January 2017. The search encompassed a five kilometre by five kilometre area, centred on the Study Area. The AHIMS search returned 26 Aboriginal sites within the search area (**Appendix 1**). The results are summarised in **Table 2-1** and site types and site locations and types are plotted in **Figure 2-4** in relation to the Study Area. Two sites are located in the southeast portion of the Study Area (AHIMS #36-1-0186 and #36-1-0188) and two sites are located in close proximity to the Study Area (AHIMS #36-1-0187 and #36-1-0246) as shown in **Figure 2-5**. The site extents shown in **Figure 2-5** are approximate and were reconstructed on the basis of information contained on the AHIMS site cards.

Table 2-1: AHIMS site types and frequencies.

Site Type	Number	% Frequency
Artefact	12	46
Modified tree (carved or scarred)	12	46
Grinding groove	2	8
TOTAL	**26**	**100**

Artefact scatters and isolated artefacts comprise almost half of the AHIMS search results. None of the AHIMS sites are registered as being associated with a potential archaeological deposit (PAD). Most of the artefact sites are located within 200 metres of a watercourse, particularly Eulomogo Creek. As such, it is possible that other unrecorded stone artefact scatters and isolated stone artefacts could be located within the Study Area, particularly within 200 metres of Eulomogo Creek. Isolated finds could be located anywhere within the Study Area. Two axe grinding groove sites are located on the bank and creek flat adjacent to Eulomogo Creek (AHIMS #36-1-0253 and #36-1-0254) on exposed sandstone outcrops several hundred metres east of the Study Area. The site cards note that there is potential for additional grinding grooves to be present beneath accumulated silt deposits. Likewise, unrecorded axe grinding grooves could exist in the Study Area on outcropping sandstone within 50 metres of Eulomogo Creek, although they could have been covered by silty sediments deposited during flood events and therefore be undetectable. Modified trees also comprise close to half the AHIMS search results. Most of these trees are located within several hundred metres of the Macquarie River, Eulomogo Creek and other ephemeral drainage lines, although several are located more than a kilometre from water. As such, culturally modified trees could exist in the Study Area where remnant mature trees of sufficient age exist – i.e. in the southeast portion of the Study Area adjacent to Eulomogo Creek.

Figure 2-4: Map showing the location of previously recorded AHIMS sites (including site types) in the vicinity of the Study Area.

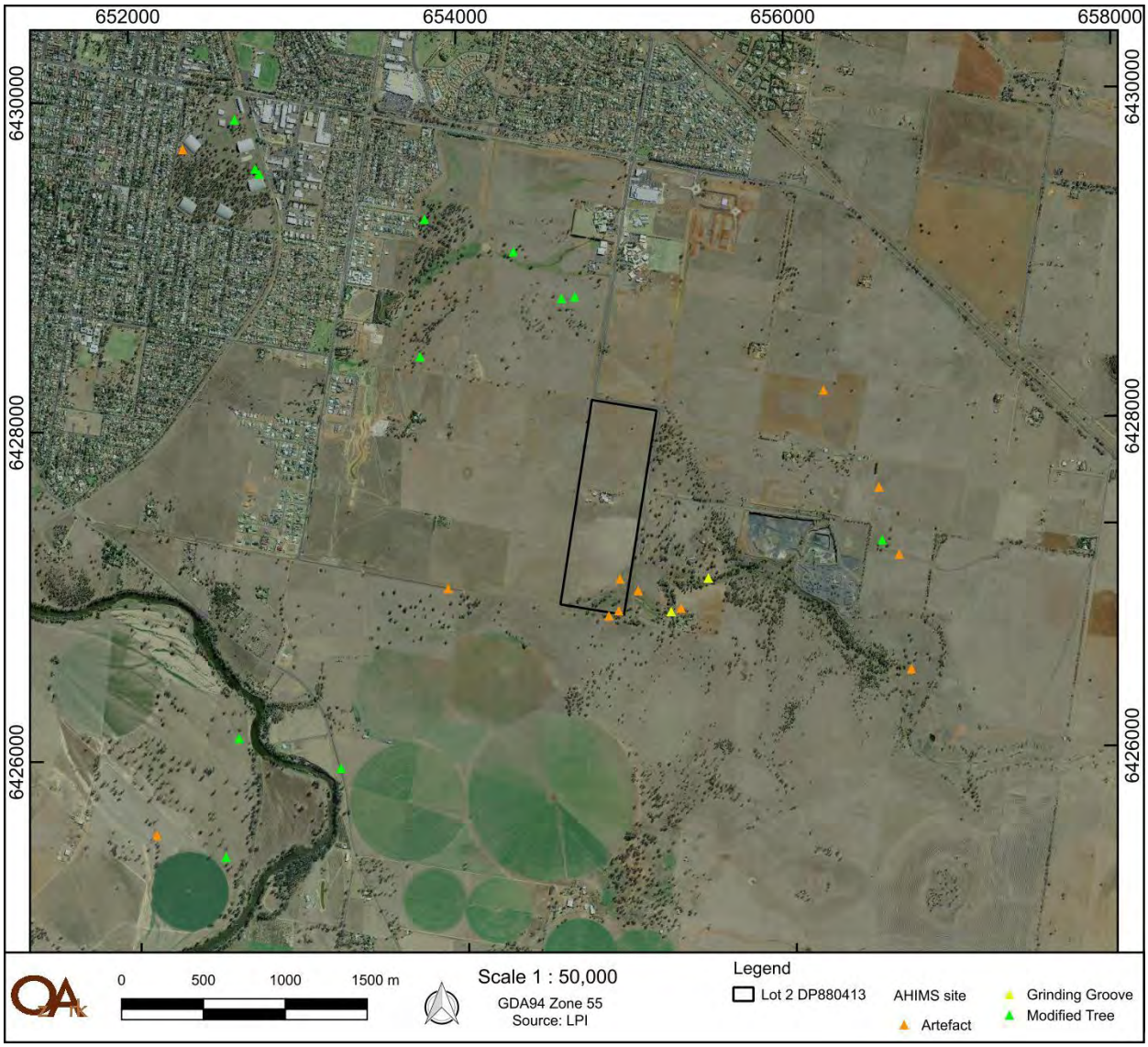


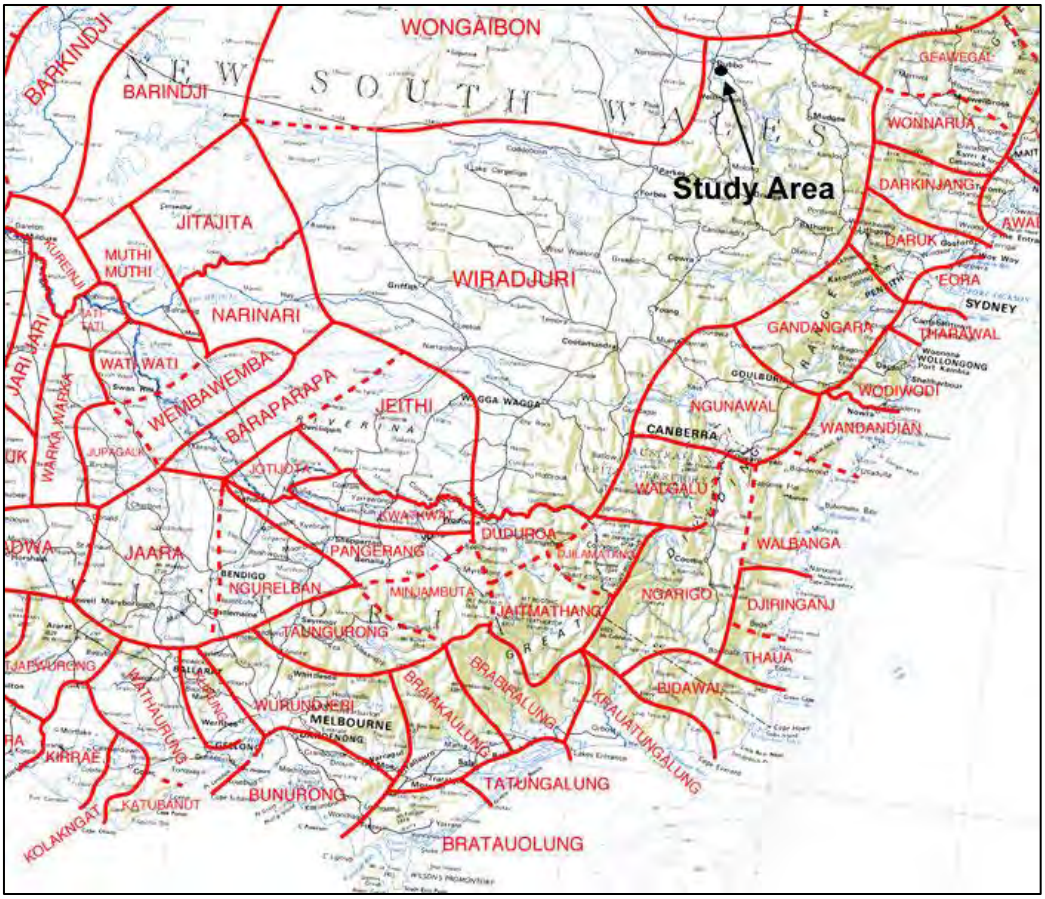
Figure 2-5: Map showing the location of previously recorded AHIMS sites (site types, AHIMS numbers and reconstructed site extents) and watercourses in the southeast of the Study Area.

2.3.3 Step 2 b)

Are there any other sources of information of which a person is already aware?

Yes. According to Tindale's (1974) and Horton's (1994) maps of tribal boundaries, the Dubbo area falls within the northern limits of the Wiradjuri 'tribal' or ethno-linguistic group (**Figure 2-6**). The Wiradjuri are typically described as a large language group or tribal nation extending over a considerable area of New South Wales, comprising numerous sub-groups. Use of the term 'tribe' and the delineation of 'tribal boundaries' on maps is considered problematic, although distinctive ethno-linguistic groups are known to exist. Two group names are used within the Dubbo region: Wiradjuri and Tubba-Gah. The Tubba-Gah comprise a local sub-group, 'clan' or mob within the larger Wirajuri entity and are historically linked to the locality encompassing the Study Area (Kelton 1995:7-8; Koettig 1985:21-22). The territory thought to have been traversed by the Tubba-Gah lies to the east of the Macquarie River, south of the Talbragar River and north of Eulomogo creek.

Figure 2-6: A portion of Tindale's (1974) map showing the location of the Wiradjuri ethno-linguistic group in relation to the Study Area.



Little recorded information survives concerning the life of Aboriginal people in the Dubbo area following European settlement (Koettig 1985:19). The most important historical resources are the oral histories passed from parent to child by local Indigenous inhabitants. The current caretakers of this knowledge are involved in a project to record that information. When it becomes available,

this resource stands to replace existing documents as the most valuable written resource describing Aboriginal cultural practices at the time of European settlement.

Early accounts of contact between European and Aboriginal people in the Macquarie River area were provided by Oxley (1820) and Sturt (1834) and later by Garnsey (1942) who was born in Dubbo in 1874. Garnsey's interest in Aboriginal cultures led him to record information gleaned from his father and from Aboriginal elders in the Dubbo area. His work remains a useful account of everyday life and religious/ceremonial practices.

According to early accounts, Tubba-Gah territory was rich in animal and plant food resources (Koettig 1985). Garnsey's (1942:6) description of camp life suggests that many activities were performed communally, for the benefit of the mob. Campsites comprised a series of bark or bush shelters arranged in a semi-circle opening to the east, arranged around a central fire, with men occupying shelters to the north, women in the centre, and children to the south. Camps moved frequently over short distances due to alterations in social relations and weather, and in response to hygiene concerns, among other factors. Longer distance movements tended to be linked to participation in large-scale gatherings (e.g. ceremony or warfare) or alterations in resource availability. Garnsey (1942:16–23) also provides detailed descriptions of ceremonial practices related to alterations in social status and passages from infancy to adulthood. These descriptions of are a composite of various verbal accounts, the accuracy of which is difficult to ascertain. Garnsey (1942:14) suggests that the 'mob' structure began to break down during the 1890s when only older men appeared to retain the tribal markings and knowledge associated with ceremonial practice. Oral histories of traditional custodians are likely to elaborate upon and refute aspects of these early accounts.

Prior to 1985, no systematic archaeological studies had been undertaken in the Dubbo region. During the late nineteenth and early twentieth centuries, interested locals and amateurs, including Milne and Gresser and to a lesser extent Garnsey, recorded a number of sites and collected artefacts, contributing to the body of archaeological data available to researchers today. A number of archaeological studies have since been conducted within the Dubbo region (Balme 1986; Koettig 1985; OzArk 2006; Pearson 1981; Purcell 2000). These provide baseline data for placing past Aboriginal sites within a regional landscape context.

Pearson (1981) worked primarily in the Upper Macquarie region. The proximity of this area to the current study area and general topographic similarities render the findings relevant to the Dubbo region. Pearson divided the archaeological sites he recorded into two main categories: occupation sites and non-occupation sites (including grinding grooves, scarred or carved trees, ceremonial and burial sites). Analysis of site locations produced a site prediction model with occupation occurring in areas with: access to water, good drainage, level ground, adequate fuel and appropriate localised weather patterns for summer or winter occupation. Occupation sites were most frequently located on low ridge tops, creek banks, gently undulating hills and river flats

and usually in open woodland vegetation (Pearson 1981:101). The location of non-occupation sites was dependent upon a variety of factors relating to site function. For instance, grinding grooves were found where appropriate outcropping sandstone occurred close to occupation sites. The location of scarred trees displayed no obvious patterning, other than proximity to watercourses. Pearson suggested that these patterns would differ on the drier plains to the west, towards Dubbo and beyond, where dependence upon larger, more permanent water supplies was greater.

Koettig (1985:81–82) examined evidence of Aboriginal occupation within five kilometres of Dubbo's city limits. She concluded that sites existed throughout all landscape units surveyed; artefact scatters, scarred trees and grinding grooves were the most frequently occurring site types; and that site location and size were determined by various environmental and social factors. Of the environmental factors, proximity to water, geological formation and availability of food resources were most important. As such, her site prediction model suggested that: all site types would occur along watercourses; stone arrangements would occur most frequently on knolls or prominent landscape features; larger campsites would occur most frequently along permanent watercourses, near springs or wetlands; small campsites could occur anywhere; scarred trees could occur anywhere, but particularly in remnant native woodland communities; campsites would be smaller and more sporadic near the headwaters of creeks; grinding grooves could occur where appropriate sandstone existed; quarries could occur wherever there were suitable stone sources; and shell middens could occur only along the Macquarie River.

The North-Central Rivers study undertaken by Balme (1986) examined site location in terms of site preservation. Balme (1986:182) found that, other than historic impacts, site distribution was most affected by geomorphic processes affecting site preservation and leading to site exposure. In addition, there was little scope for the assessment of site chronologies as few datable contexts had been located. Balme also concluded that sites recorded on AHIMS from ethnographic accounts were unlikely to be relocated.

In an assessment of the Pilliga and Goonoo State Forests, Purcell (2000) recorded 47 and 106 Aboriginal sites respectively. Purcell (2000:31) found that sites were more frequently located within alluvium landforms including creeks, swamps and chains of ponds surrounded by floodplains and terraces, and that 91.5 per cent of sites were recorded within 200 to 300 meters of water.

OzArk (2006) assessed Indigenous heritage resources within the former Dubbo LGA (now part of the Dubbo Regional LGA) to assist Dubbo City Council with planning. This study aimed to: consolidate previous surveys and assessments of Indigenous heritage; set a baseline for further study; and survey areas zoned for future expansion. Approximately 1,120 hectares of land was surveyed within five study areas surrounding the city of Dubbo, including two areas located within three kilometres west of the Study Area. During the survey, 26 new Aboriginal sites were recorded

and eight out of 12 previously recorded sites were relocated. Proportions of newly located sites by type were similar to those found in previous studies. Fewer scarred trees were found than expected, likely due to intensive agricultural practices and associated tree clearance around Dubbo city compared to the broader Dubbo LGA. No new grinding groove sites were found, which was likely, given that this site type comprised only 3.6 per cent of previously located sites within the Dubbo LGA. Scarred tree distribution adhered to the predictive model, exclusively following waterways and fence-lines, although this probably reflected land clearing practices more than Indigenous site patterning. Isolated finds and open sites followed a similar pattern, largely limited to watercourse edges and elevated terraces within 500 meters of the Macquarie River and other permanent to semi-permanent waterways. No significant patterning emerged in terms of site size or quality, perhaps because surface manifestations often do not adequately reflect site size or complexity.

OzArk (2014) undertook an archaeological assessment of Lot 710 DP 1041906 comprising approximately 15 hectares located 1.5 kilometres west of the Study Area. One new open site comprising two silcrete artefacts and an associated PAD was recorded on a gentle south trending slope, approximately 300 metres north of the Macquarie River.

Kelton (1995) undertook an archaeological survey for the proposed 'Keswick' housing subdivision of 415 hectares of rural land encompassing the Study Area and several adjoining lots. Seven Aboriginal sites comprising four artefact scatters, two isolated artefacts and one culturally modified tree (scarred) were recorded in the area. All recorded sites were located within several hundred metres of Eulomogo Creek and the Macquarie River on elevated floodplains (above the one-in-a-hundred-year flood zone) and the banks and elevated banks of Eulomogo Creek. Flaked stone artefacts were composed of chert, mudstone, quartzite, quartz and basalt; and grinding stone fragments were composed of mudstone and sandstone.

During the Kelton (1995) survey two sites were recorded in the southeast corner of the Study Area and one site just outside of the Study Area. An extensive artefact scatter was recorded in the Study Area on the north bank of Eulomogo Creek (AHIMS #36-1-0188); an isolated artefact was recorded on the southern bank of Eulomogo Creek in the Study Area (#36-1-0186); and an artefact scatter was recorded on the southern bank of Eulomogo Creek about 20 metres south of the Study Area (#36-1-0187) (**Figure 2-5**). As such, Kelton (1995:36) assessed the entire south bank of Eulomogo Creek (within the area surveyed, including the southeast portion of the Study Area and AHIMS #36-1-0186) as being as being archaeologically sensitive with potential to contain relatively undisturbed subsurface archaeological deposits. Kelton recommended that no further disturbance occur in this area, particularly in relation to any future development. Kelton (1995:39) assessed the area in the vicinity of AHIMS #36-1-0188 north of Eulomogo Creek in the Study Area as having potential to contain an extensive subsurface archaeological deposit in areas of minimal ground surface disturbance. As such, Kelton (1995:48) provides three management

options for the southeast corner of the Study Area: (1) that the entire south-eastern corner of the Study Area be set aside as an 'archaeological conservation zone'; or (2) that no ground surface disturbance occur within the #36-1-0188 site boundaries, including a 50 metre buffer around the site; or (3) that text excavations occur to characterise #36-1-0188.

OzArk (2015) undertook a Due Diligence assessment of neighbouring Lot 399 DP1199356 and Lot 503 DP1152321 west of the Study Area, previously surveyed by Kelton (1995). No new sites were recorded during the field inspection and AHIMS #36-1-0189, previously recorded by Kelton (1995), was unable to be located, probably due to low ground surface visibility (GSV). AHIMS #36-1-0189 is an artefact scatter located approximately 700 metres west of the Study Area, 100 metres northwest of Eulomogo Creek, comprising an approximately 1.2 hectare open artefact scatter containing 50 to 100 stone artefacts including: a bifacially knapped basalt axe blank, three 'multipurpose hammerstones' and quartzite and chert flakes and flaked pieces.

Heritage database searches were undertaken to identify any previously recorded Aboriginal sites and places in the Study Area. The database search results are summarised in **Table 2-2**.

Table 2-2: Aboriginal heritage: summary of desktop-database search results.

Name of Database Searched	Date of Search	Type of Search	Comment
Australian Heritage Database	7/2/2017	Dubbo Regional LGA	No places listed are near the Study Area
NSW Heritage Office State Heritage Register and State Heritage Inventory	7/2/2017	Dubbo Regional LGA	No places listed are near the Study Area
National Native Title Claims Search	7/2/2017	Dubbo Regional LGA	No Native Title Claims cover the Study Area
OEH AHIMS	12/1/2017	5 km x 5km area centred on the Study Area	26 sites are located within the search area
Local Environment Plan (LEP)	7/2/2017	Dubbo LEP 2011	No places listed are near the Study Area

Previous archaeological studies and the results of heritage databases searches indicate that two previously recorded Aboriginal sites exist in the Study Area (AHIMS #36-1-0186 and #36-1-0188) and one previously recorded site is located close to the southern boundary of the Study Area (AHIMS #36-1-0187). There are no other known Aboriginal cultural values associated with the Study Area, although it is noted that Aboriginal community representatives did not accompany the current visual inspection. The results of the desktop assessment suggest that unidentified Aboriginal sites could exist in the Study Area, particularly on landforms with Aboriginal archaeological potential, including the southeast portion of the Study Area adjacent to Eulomogo Creek.

2.3.4 Step 2 c)

Are there any landscape features that are likely to indicate presence of Aboriginal objects?

Yes. The Study Area is located in the Brigalow Belt South bioregion (Talbragar subregion) (NPWS 2003: 131-137). At the time of European settlement, vegetation in the vicinity of the Study Area would have comprised eucalypt and cyprus pine woodland, with some river oak (*Casuarina cunninghamiana*) along Eulomogo Creek. These plant communities would have supported a variety of native fauna and provided Aboriginal people with access to a range of plant and animal resources.

Characteristic landforms of the Talbragar subregion include residual rocky hills, undulating long slopes and wash plains, and wide valley floors with sandy streams. Thin stony loams and texture contrast soils cover most of the landscape with deeper sands and brown earths on valley floors. The Study Area includes three Mitchell (2002) landscape units (**Figure 2-7**): (1) Macquarie Alluvial Plains (southwest corner); (2) Goonoo Slopes (south-central parts); and (3) Dubbo Basalts (northern parts). The Macquarie Alluvial Plain landscape unit is a plain associated with the Macquarie River main alluvial fan and distributary stream system with local relief of one to three metres. The Goonoo Slopes landscape unit includes undulating to stepped low hills with long slopes; and the Dubbo Basalts landscape unit includes slightly elevated plains and low hills on flat lying Tertiary basalt and trachyte flows, roughly parallel to the present course of the Macquarie River, with local relief to 10 metres.

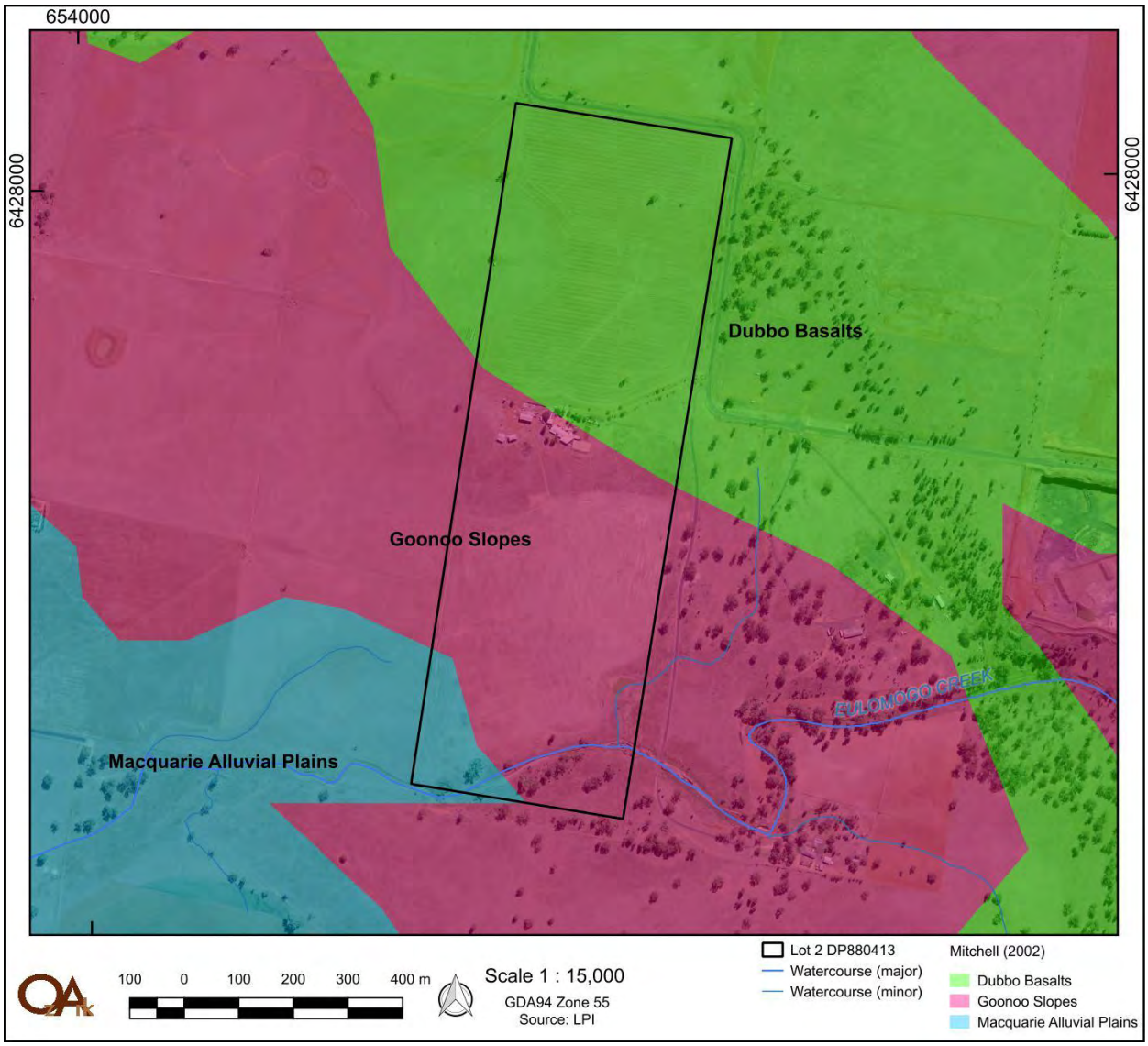
In terms of hydrology, the Study Area is located approximately two kilometres northeast of the Macquarie River, the region's major waterway. Eulomogo Creek is an intermittent tributary of the Macquarie River that flows southwest through the southern portion of the Study Area. An ephemeral drainage line also enters the southeast corner of the Study Area, flowing south into Eulomogo Creek (**Figure 2-5** and **Figure 2-7**).

In summary, artefact scatters and culturally modified trees are the most likely site types to be encountered in the Study Area. Artefacts are likely to have been manufactured from chert, mudstone, quartzite, quartz and volcanic materials. Artefact scatters are likely to be located adjacent to Eulomogo Creek and the ephemeral drainage line, particularly on flat alluvial rises and gentle slopes, as well as on the gentle upper slopes and crests of nearby hills. Aboriginal scarred trees could also exist in the Study Area where mature trees of sufficient age to contain Aboriginal scarring exist. Axe grinding grooves could be located on outcropping sandstone within 50 metres of Eulomogo Creek including the creek bed, particularly adjacent to artefact scatters and open camp sites. Quarries for the procurement of raw materials for the manufacture of stone tools are possible where suitable sources of outcropping stone occur.

Aboriginal archaeological deposits are likely to have been harmed or destroyed by a variety of land use activities and disturbances within the Study Area, particularly: vegetation clearing;

ploughing; powerline construction; construction of farm buildings, fences and water management infrastructure (e.g. pipelines and an earthen dam); and erosion (e.g. wind, sheet wash, rill, gully and streambank erosion). Nevertheless, two known Aboriginal sites exist in the Study Area and landforms with potential to contain unidentified Aboriginal sites exist. As such, visual inspection of the Study Area is required.

Figure 2-7: Map showing the Michell (2002) landscape units of the Study Area.



2.3.5 Step 3

Can harm to Aboriginal objects listed on AHIMS or identified by other sources of information and/or can the carrying out of the activity at the relevant landscape features be avoided?

No. The Proposal includes landscape features that contain, or have potential to contain, Aboriginal objects and sites, and these landscape features have not been avoided.

2.3.6 Step 4

Does a desktop assessment and visual inspection confirm that there are Aboriginal objects or that they are likely?

Yes. The visual inspection of the Study Area was undertaken by OzArk Senior Archaeologist, Dr Chris Lovell, on Thursday 19 January 2017. One new site was recorded during the survey (Hillview-IF1; isolated artefact) and three previously recorded Aboriginal sites were assessed, including two that were confirmed as being located within the Study Area (**Section 3**).

Standard archaeological field survey and recording methods were employed (Burke and Smith 2004). A combination of vehicle traverses and pedestrian transects were used to assess the Study Area. Emphasis was placed upon areas with minimal ground surface disturbance and landforms identified as having Aboriginal archaeological potential. These areas include: the crest of a low hill on the western boundary to the north (survey unit 1; **Plate 1**); central areas to the west (survey unit 2; **Plate 2**) and east (survey unit 3; **Plate 3**) of the house and sheds; an area to the north of Eulomogo Creek in the vicinity of AHIMS #36-1-0188 (survey unit 4; **Plate 4**); areas along the northern and southern banks and bed of Eulomogo Creek (survey unit 5; **Plates 5** to **7**); and the crest of a low hill overlooking Eulomogo Creek (survey unit 6; **Plate 8**). Survey data for each survey unit is summarised in **Table 2-3**.

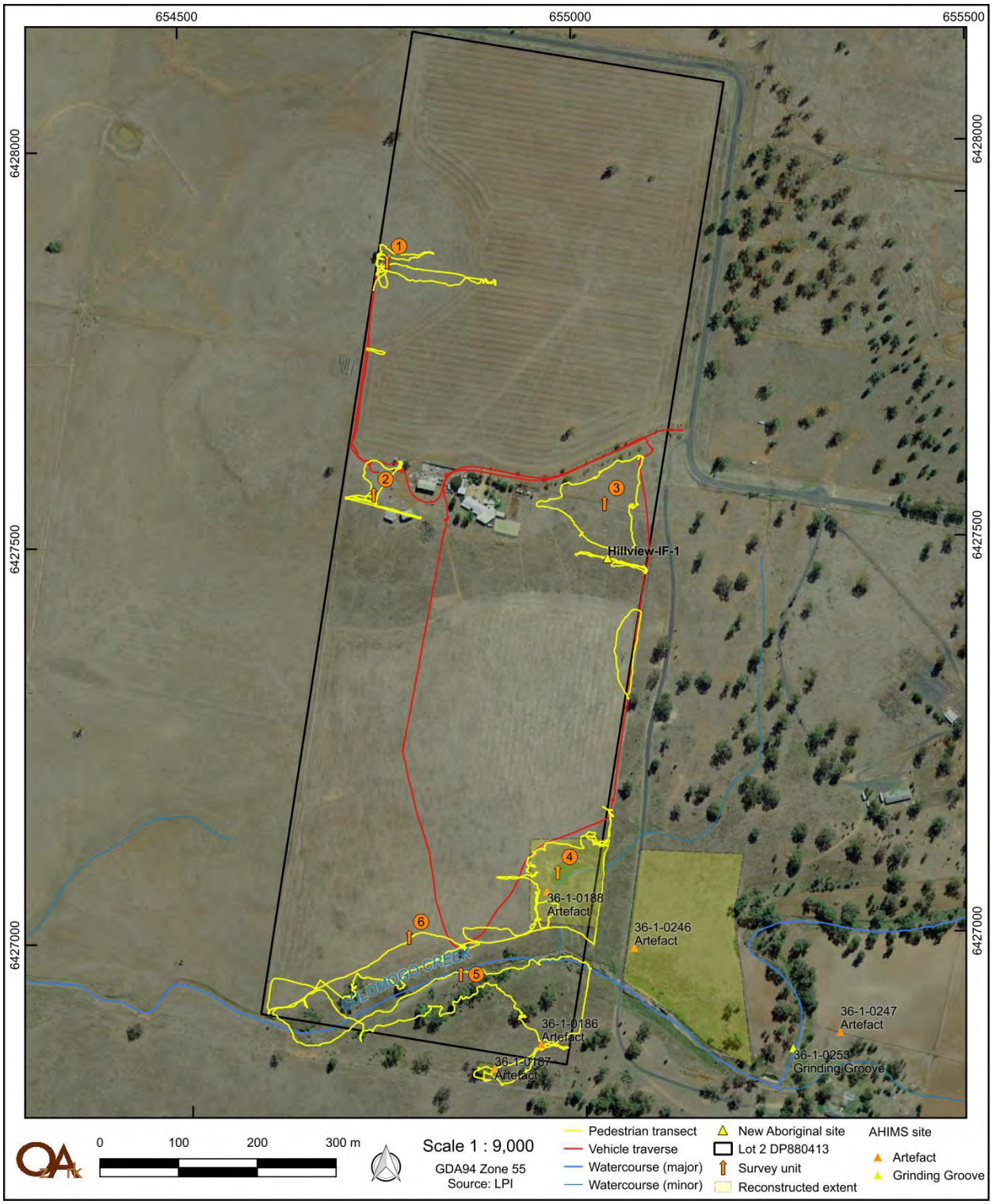
Table 2-3: Survey data

Survey unit	Landform	Exposure	GSV	Note	Disturbance
1	Crest and gentle to moderate upper slope	20	10	Low GSV due to grass/forb cover	Cleared, grazed, fence, vehicle track, trampled, sheet wash, wind erosion, water tank
2	Flat to gentle bench and mid-slope	30	20	Low GSV due to grass/forb cover	Cleared, grazed, fence, vehicle track, trampled, sheet wash, wind erosion, machinery cut
3	Gentle mid-slope	30	20	Low GSV due to grass/forb cover	Cleared, grazed, fence, trampled, sheet wash, wind erosion, machinery cut, possibly ploughed
4	Stream bank	30	10	Low GSV due to grass/forb cover	Cleared, grazed, fence, dam, vehicle track, trampled, sheet wash, machinery cut
5	Stream bank, flat and bed	40	10	Low GSV due to grass/forb cover	Cleared, grazed, vehicle track, trampled, sheet wash, streambank, wind erosion, powerline
6	Crest of low hill	30	0	Low GSV due to grass/forb cover	Cleared, grazed, trampled, sheet wash, wind erosion

All trees with potential to contain Aboriginal cultural scarring or carving were inspected and no Aboriginal modified trees were identified. The Eulomogo Creek bed and banks were inspected for axe grinding grooves and none were identified. Vehicle and pedestrian track data, survey unit locations and the new site location were captured via handheld GPS as shown in **Figure 2-8**. Representative photographs of the survey units are shown in **Plates 1** to **8**. Exposure within the survey units ranged from 20 to 40 per cent, which is considered sufficient to reveal archaeological material; however, GSV was generally low to very low (ranging from zero to 20 per cent) due to

extensive grass and forb cover attributable to recent prevailing wet weather. Nevertheless, GSV and exposure combined with background research identifying previously recorded and predicted Aboriginal site locations was considered sufficient to assess the locations of previously recorded sites as well as the archaeological potential of all landforms within the Study Area.

Figure 2-8: Map showing survey coverage (survey units, vehicle traverses and pedestrian transects), AHIMS sites and the newly recorded Aboriginal site in the Study Area.



A ‘yes’ answer to Step 4 requires that ‘further investigation and impact assessment’ of the Study Area be undertaken. Integral to the preparation of an Aboriginal Cultural Heritage Assessment Report (ACHAR) is the requirement to follow the OEH *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (DECCW 2010a; ACHCRs).

If, after this detailed investigation and impact assessment, it is decided that harm will occur to Aboriginal objects then an Aboriginal Heritage Impact Permit (AHIP) application must be made. The NPW Act is complemented by the *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW* (DECCW 2010b; Code of Practice) that sets out the requirements for archaeological investigation in NSW where an application for an AHIP is likely to be made.

3 ABORIGINAL SITES RECORDED AND ASSESSED

One new Aboriginal site was recorded during the visual inspection (Hillview-IF1) and three previously recorded Aboriginal sites were assessed (AHIMS #36-1-0186, #36-1-0187 and #36-1-0188). Details of these sites are summarised in **Table 3-1** and their locations and reconstructed site extents are shown in **Figure 2-8**.

Table 3-1: Summary of Aboriginal sites recorded and assessed.

Site Name	AHIMS ID	Coordinates (GDA94 Zone 55, centre point)	Site type	Artefact Count	Site Dimensions (m)
Hillview-IF1	36-1-0707	655038E 6427478N	Isolated find	1	1 x 1
K-IF-2	36-1-0186	654944E 6426865N	Isolated find	1	1 x 1
K-OS-2	36-1-0187	654884E 6426835N	Artefact scatter	6	10 x 2
K-OS-3	36-1-0188	654954E 6427058N	Artefact scatter	37	85 x 110

3.1 NEWLY RECORDED ABORIGINAL SITE

Hillview-IF1

AHIMS ID: 36-1-0707

Site Type: Isolated find

Location of Site: Hillview-IF1 is approximately 5.5 kilometres southeast of the Dubbo CBD; 510 metres north of Eulomogo Creek; 185 metres south southwest of the property entrance gates off Sheraton Road; 150 metres east south east of a residential house; and one metre south of a paddock fence (**Figure 2-8** and **Figure 3-2**).

Description of Site: Hillview-IF1 is a newly recorded isolated stone artefact (**Figure 3-1**): a mudstone multidirectional core with at least five flake removal scars at a secondary stage of reduction (approximately 25 per cent cortex remaining). The core is possibly opportunistic, with flakes perhaps removed to test the cobble. The site is located on a gentle mid-slope landform in a cleared, grazed and possibly ploughed paddock, beside a paddock fence, below a large bench that contains the property's residence and sheds (**Figure 3-2**). No other artefacts were visible in the vicinity of the site, although exposure was good (40 per cent) but GSV was poor (10 per cent). As such, other Aboriginal objects could exist in the vicinity of the site. However, the potential for subsurface archaeological deposits was assessed as being low-moderate due to distance from water (500 metres to Eulomogo Creek, and 200 metres from an ephemeral drainage line), the gentle sloping landform, and levels of ground disturbance (fence construction, machinery cut, vegetation clearing, grazing, trampling and possibly ploughing). Soils comprised brown medium sand and vegetation included grasses and forbs.

Figure 3-1: Photographs showing an overview of Hillview-IF1 and the artefact.

<table>
<tr><td>  </td><td>  </td></tr>
<tr><td>1. View west to Hillview-IF1 (pink flag) beside fence.</td><td>2. View east to Hillview-IF1 (pink flag) beside fence</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td>3. View of mudstone core showing flake removal scars.</td><td>3. View of mudstone core showing flake removal scars.</td></tr>
</table>

Figure 3-2: Map showing Hillview-IF1 in relation to the Study Area.

3.2 PREVIOUSLY RECORDED ABORIGINAL SITES

K-IF-2 (#36-1-0186)

AHIMS ID: 36-1-0186

Site Type: Isolated find

Location of Site: According to the site card, K-IF-2 is located approximately 5.7 kilometres southeast of the Dubbo CBD; 800 metres south of the property entrance gates off Sheraton Road; 100 metres west of a north-south to east-west bend in Sheraton Road; 100 metres south of Eulomogo Creek; and 30 metres west of a low voltage powerline pole (number: 6287-820) (**Figure 2-8** and **Figure 3-4**).

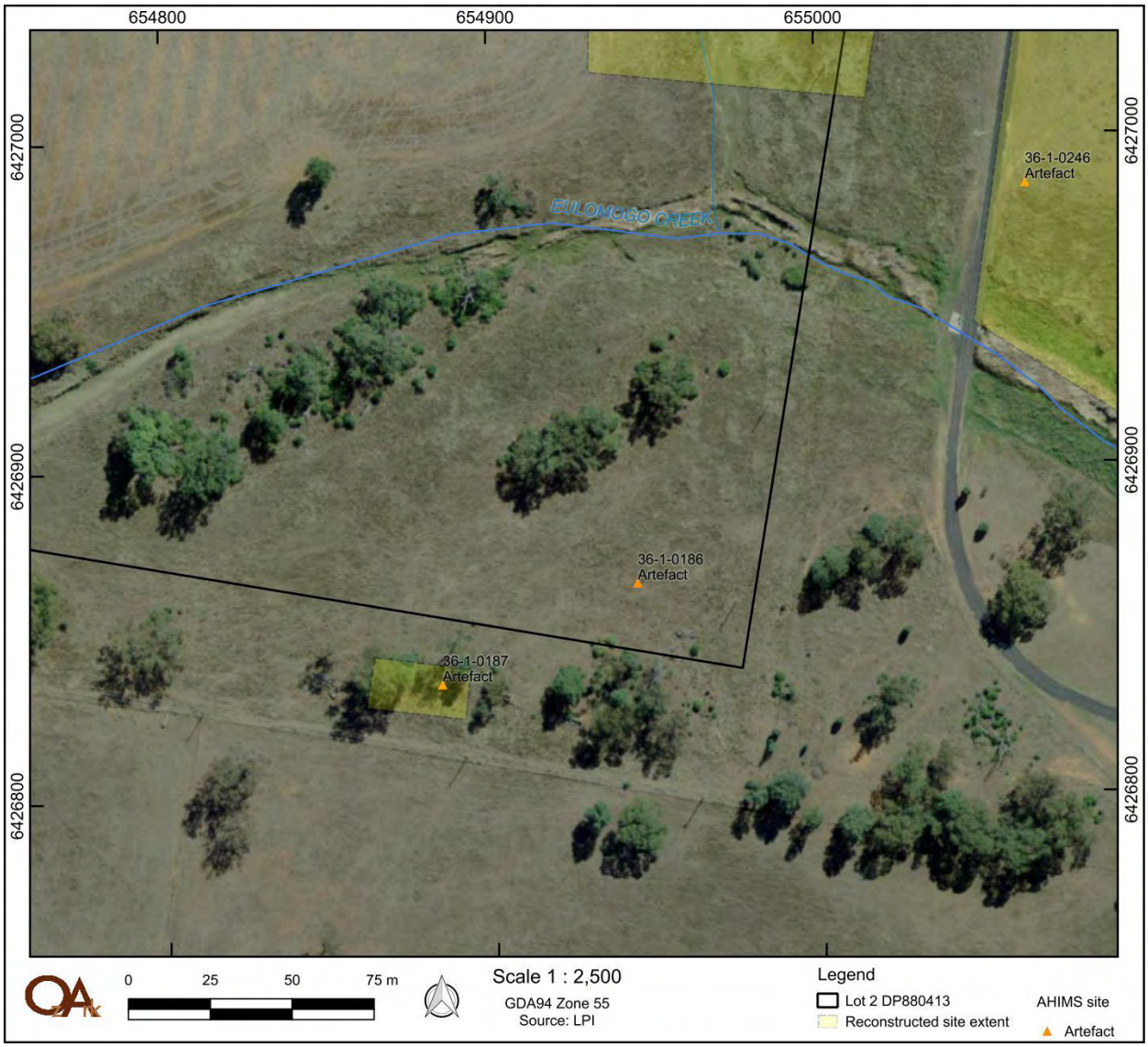
Description of Site: According to Kelton (1995) and the site card, K-IF-2 is a yellow/tan broken sandstone grinding stone (millstone) with unifacial use wear (silica gloss, barely visible on one side) located on a creek flat landform adjacent to Eulomogo Creek. The artefact measures approximately 22 by 19 by 3.2 centimetres. A large freshwater mussel fragment of uncertain provenance was found 10 to 20 metres west of the grinding stone.

During the visual inspection, an attempt was made to locate the artefact using a GPS receiver (**Figure 3-3**). AHIMS site coordinates were verified against the site card maps and location description (**Figure 3-4**). The artefact was unable to be located, probably due to extensive grass cover obscuring GSV (close to zero). It is considered likely that the artefact is present at the location and would be visible under conditions of greater GSV.

Figure 3-3: Photograph from Kelton (1995) and current overview of the K-IF-2 site location.

	
1. Photograph taken by Kelton (1995) showing the site location and grinding stone fragment (foreground, in front of peg).	2. Current photograph of the K-IF-2 site location, facing west, showing limited GSV and intensive grass cover. The photograph appears to show a similar location and orientation to photograph 1. The shrub in the foreground appears to have been removed.

Figure 3-4: Map showing the K-IF-2 (#36-1-0186) and K-OS-2 (#36-1-0187) AHIMS site locations and reconstructed site extents in relation to the Study Area.



K-OS-2 (#36-1-0187)

AHIMS ID: 36-1-0187

Site Type: Open site (artefact scatter, area of potential archaeological sensitivity [PAS])

Location of Site: According to the site card, K-OS-2 is located approximately 5.7 kilometres southeast of the Dubbo CBD; 840 metres south of the property entrance gates off Sheraton Road; 160 metres west southwest of a north-south to east-west bend in Sheraton Road; 130 metres south of Eulomogo Creek; and 20 metres north northwest of a low voltage powerline pole (number: 6289-820) (**Figure 2-8**).

Description of Site: According to Kelton (1995) and the site card, K-OS-2 is a small artefact scatter located on an unformed vehicle track on a creek flat landform adjacent to Eulomogo Creek. Kelton (1995) recorded six artefacts (quartz and quartzite flakes, cores

and debitage) in an approximately 10 by two metre area. Kelton (1995) assessed the entire southern bank and creek flat of Eulomogo Creek in the Study Area as being an area of PAS, with potential to contain subsurface archaeological deposits, due to the high potential landform and proximity to the high significance site: K-OS-3 (see below).

During the visual inspection, an attempt was made to locate the artefact scatter using a GPS receiver. Site location coordinates were provided by AHIMS and verified against the site card maps and location description (**Figure 3-4**). An approximate site extent was reconstructed on the basis of the site card map. The artefacts were unable to be located, probably due to intensive grass cover obscuring GSV (close to zero) in the vicinity of the site location. It is considered likely that the artefacts are present at the site location and would be visible under conditions of greater GSV.

It was confirmed that the site location and reconstructed site extent are not located in the Study Area, but are about 20 metres south of the Lot 2 DP880413 southern cadastral boundary. It was noted that the southern paddock boundary fence does not follow the Lot 2 DP880413 cadastral boundary, but is located approximately 40 metres to the south.

Figure 3-5: Photographs from Kelton (1995) and a current overview of the K-OS-2 site location.

	
1. Photograph taken by Kelton (1995) showing an overview of the site location, facing west.	2. Photograph of the K-OS-2 site location taken during the visual inspection, facing west, showing limited GSV and intensive grass cover. This photograph appears to have been taken in a similar location and orientation to photograph 1. The shrub in the foreground (left) of photograph 1 appears to have been removed and the vehicle track that contains the site rerouted to follow the fence line.

K-OS-3 (#36-1-0188)

AHIMS ID: 36-1-0188

Site Type: Open site (artefact scatter, PAD)

Location of Site: According to the site card, K-OS-3 is located approximately 5.5 kilometres southeast of the Dubbo CBD; 600 metres south of the property entrance gates off Sheraton Road; 200 metres north northwest of a north-south to east-west bend in Sheraton Road and 80 metres north of Eulomogo Creek. The site extent contains a low voltage powerline pole (number: 6284-820) in the northeast corner and an ephemeral drainage line and earthen dam in the central parts (**Figure 2-8**).

Description of Site: According to Kelton (1995) and the site card, K-OS-3 is an extensive low-density artefact scatter located on a slightly elevated, gently sloping landform northwest of the confluence of Eulomogo Creek and an unnamed ephemeral drainage line. On the basis of visible surface artefacts, Kelton (1995: 38) determined that the site extent was roughly crescent-shaped, extending from the northern elevated bank of Eulomogo Creek in a northern and northeast direction, along the elevated northern and western banks and shoulders of the unnamed drainage line, within an approximately 90 by 90 metre area (**Figure 3-6**).

Kelton observed 37 stone artefacts and recorded 22 of them in five different areas of exposure. Artefacts included quartz, quartzite, chert and silcrete flakes, cores and debitage and a grinding stone (millstone) fragment. Kelton (1995) assessed the site as having potential to contain an extensive subsurface archaeological deposit in areas of minimal disturbance due to the high potential archaeological sensitivity of the landform and presence of surface archaeological material.

During the visual inspection, an attempt was made to locate the artefact scatter using a GPS receiver and focusing on the five areas where Kelton recorded artefacts. Site location coordinates were provided by AHIMS and verified against the site card maps and location description. The artefacts were unable to be located, probably due to intensive grass cover obscuring GSV (close to zero) in the vicinity of the site location. An earthen dam has been constructed within the site extent since the site was recorded (**Figure 3-7**) and has likely destroyed part of the site, including at least one area where Kelton recorded artefacts. It is nevertheless considered likely that artefacts are present within the remaining intact portions of the site and would be visible under conditions of greater GSV.

An updated site extent was delineated on the basis of Kelton's (1995) site description, landform potential and currently observed levels of site disturbance, including the construction of the earthen dam (**Figure 3-7**). The updated site extent is assessed as

being a PAD on the basis of landform potential, levels of disturbance and presence of previously recorded artefacts.

Figure 3-6: Map showing the K-OS-3 (#36-1-0188) AHIMS site location and updated reconstructed site extent in relation to the Study Area.

Figure 3-7: Photographs from Kelton (1995) and current views of the K-OS-3 site location.

1. Photograph taken by Kelton (1995) showing an overview of the site location, facing east.

2. Photograph taken by Kelton (1995) showing an overview of the site location, facing north.

3. Current photograph of the K-OS-3 site location in the northern part of the site, facing south, showing the earthen dam and nil GSV due to grass cover. This is one of the areas Kelton recorded artefacts.

4. Current photograph of the K-OS-3 site location in the southern part of the site, facing northeast, showing the earthen dam, dumped construction waste and limited GSV due to grass cover.

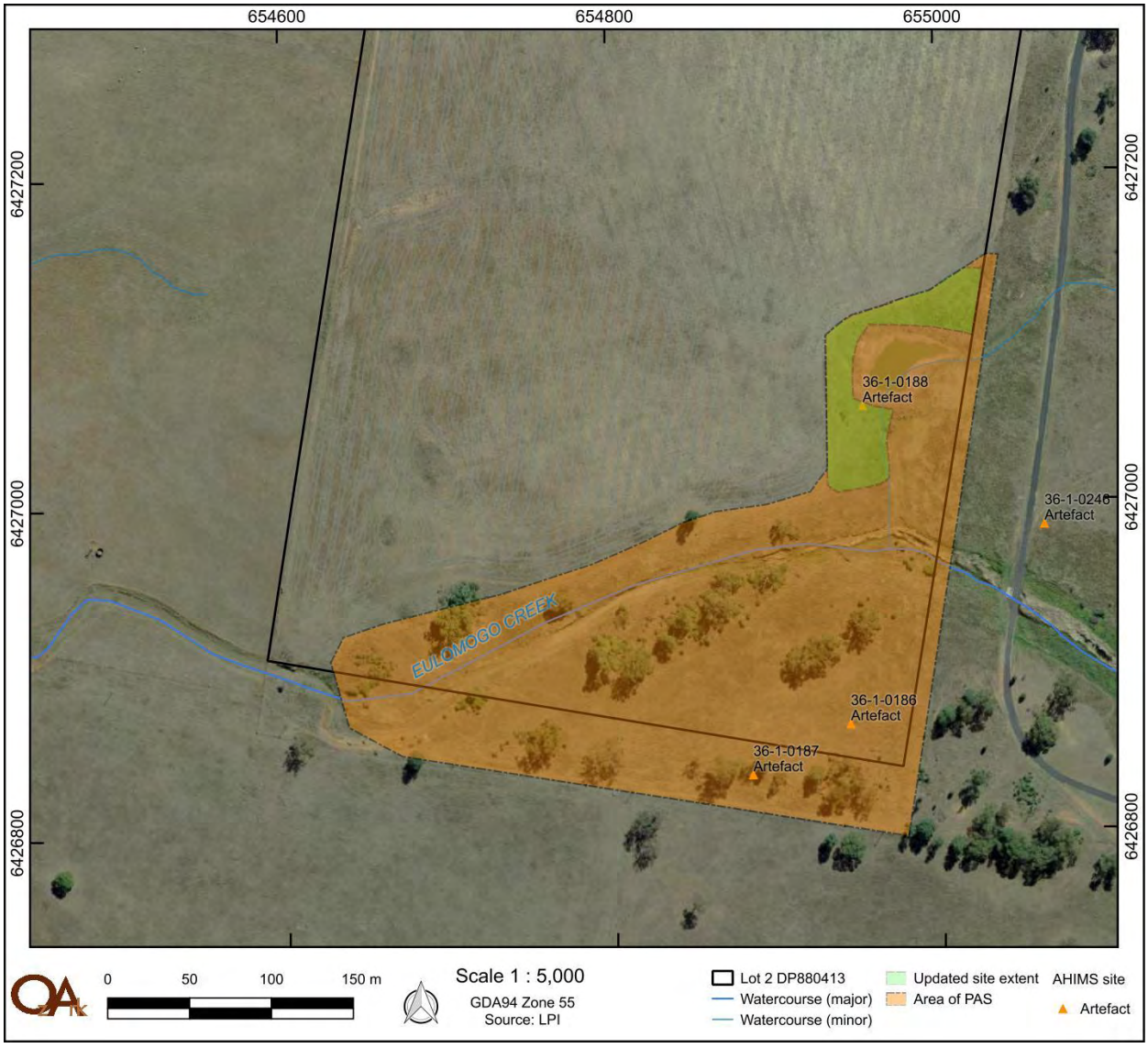
5. Current photograph of the K-OS-3 site location in the western part of the site, facing west, showing an area of exposure where Kelton recorded artefacts, with limited GSV due to grass cover.

6. Current photograph of the K-OS-3 site location in the southern part of the site, facing northwest, showing nil GSV due to grass cover.

3.3 AREA OF POTENTIAL ARCHAEOLOGICAL SENSITIVITY

In accordance with Kelton's (1995) assessment of the southern bank of Eulomogo Creek and creek flat, and an updated assessment of archaeological potential of the northern bank and associated gently sloping landforms, an area of PAS has been delineated as shown in **Figure 3-8**. This area is delineated on the basis of landform potential and the presence of previously recorded Aboriginal objects, sites and PAD. The area of PAS is delineated by: an approximately 30 metre buffer north of the Eulomogo Creek northern bank; the #36-1-0188 updated site extent; and the eastern and southern paddock fence lines. The area of PAS likely extends further east and south of the fence lines, but these areas are not within the Study Area and were therefore not assessed.

Figure 3-8: Map showing the Area of PAS in relation to the Study Area.



There is a moderate to high likelihood that additional Aboriginal objects and archaeological deposits exist in the area of PAS. If the area of PAS is to be impacted, a detailed archaeological investigation would be required to establish whether additional Aboriginal objects, sites and PADs

exist – i.e. in addition to the objects, sites and PAD identified at AHIMS #36-1-0186, #36-1-0187 and #36-1-0188. Ideally, survey would be conducted when there is significantly more GSV than existed during the current visual inspection.

4 MANAGEMENT RECOMMENDATIONS

The Due Diligence archaeological assessment has taken into consideration the impacts of a proposed housing development that will disturb the ground surface. Two previously recorded AHIMS sites, one newly recorded Aboriginal site and an area of PAS have been identified and assessed within the Study Area. The assessment has concluded that Aboriginal objects or intact archaeological deposits are likely to be harmed by the Proposal. This moves the Proposal to the following outcome: 'further investigation and impact assessment' of the Study Area must be undertaken.

To ensure that the Aboriginal cultural heritage values of the Study Area are protected, the following recommendations are made:

1. Further investigation and impact assessment of the Study Area must be undertaken, including the preparation of an ACHAR, following the ACHCRs and adhering to the Code of Practice. If this assessment concludes that harm to Aboriginal objects will occur, then an AHIP application must be made.
2. Ground disturbing activities must not occur within the riparian zone or within the Study Area boundaries south of Eulomogo Creek. This will avoid harm to AHIMS #36-1-0186 and most of the area of PAS (**Figure 3-8**). Due to the close proximity to the Study Area, management of AHIMS #36-1-0187 may also be required during the proposed work to avoid inadvertently harming the site.
3. The establishment of a riparian zone around Eulomogo Creek has not avoided ground disturbing activities within the updated AHIMS #36-1-0188 site extent and PAD area (**Figure 3-6**) or within the northeast portion of the area of PAS (**Figure 3-8**). If ground disturbing work cannot be avoided in this area, test excavations in accordance with the Code of Practice will be required to establish whether an archaeological deposit exists in this area, with the results reported in an Archaeological Assessment Report or included in the ACHAR. Surface salvage of previously recorded artefacts and, possibly, salvage excavations will subsequently be required under an AHIP.
4. Harm to Hillview-IF1 has not been avoided and therefore surface collection of the artefact will be required under an AHIP.

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PLATES

Plate 1: View of survey unit 1 (crest of low hill on eastern boundary, northern paddock) facing north, showing disturbance around a water tank, gate and fence.

Plate 2: View of survey unit 2 (central area, flat bench, west of house and sheds) facing south, showing limited GSV and disturbance due to the installation of farming infrastructure.

Plate 3: View of survey unit 3 (gentle mid slope, east of house and sheds) facing west, showing good GSV and disturbance due to water tank installation, fencing and house construction.

Plate 4: View of survey unit 4 (northern bank of Eulomogo Creek and unnamed drainage line encompassing AHIMS #36-1-0188) showing very limited GSV due to grass cover.

Plate 5: View of survey unit 5 showing the northern bank of Eulomogo Creek, facing west, with very limited GSV due to grass cover.

Plate 6: View of survey unit 5 showing the southern bank and creek flat of Eulomogo Creek, facing southeast, with very limited GSV due to grass cover.

Plate 7: View of survey unit 5 showing the Eulomogo Creek bed, facing west.

Plate 8: View of survey unit 6 (crest of low hill overlooking Eulomogo Creek) facing east, showing very limited GSV.

Plate 9: View of the central Study Area facing east, showing disturbance around the house and sheds.

Plate 10: View of ploughed paddock in the northern portion of the Study Area, facing south.

Plate 11: View of ploughed paddock in the southern portion of the Study Area, north of Eulomogo Creek, facing southwest.

APPENDIX 1: AHIMS SEARCH RESULTS

Office of Environment & Heritage NSW

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : 1545 Lot2DP880413#1
Client Service ID : 262045

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
36-1-0246	EC-OS-1; Eulomogo Creek;	AGD	55	654950	6426800	Open site	Valid	Artefact : -	Open Camp Site	4378
	Contact	Recorders	Central West Archaeological and Heritage Services Pty Ltd					Permits	1276,1277	
36-1-0247	EC-OS-3; Eulomogo Creek;	AGD	55	655210	6426690	Open site	Valid	Artefact : -	Open Camp Site	4378
	Contact	Recorders	Central West Archaeological and Heritage Services Pty Ltd					Permits	1276,1277	
36-1-0248	Eulomogo Creek (EC-OS-3)	GDA	55	656544	6427593	Open site	Valid	Artefact : -	Open Camp Site	4378
	Contact	Recorders	Central West Archaeological and Heritage Services Pty Ltd,OzArk Environmental a					Permits	1276,1277	
36-1-0249	EC-OS-4; Keswick South (Eulomogo);	AGD	55	656100	6426000	Open site	Valid	Artefact : -	Open Camp Site	4378
	Contact	Recorders	Central West Archaeological and Heritage Services Pty Ltd					Permits	1276,1277	
36-1-0250	EC-OS-5; Keswick South (Eulomogo)	GDA	55	656662	6427183	Open site	Valid	Artefact : -	Open Camp Site	4378
	Contact	Recorders	Central West Archaeological and Heritage Services Pty Ltd,OzArk Environmental a					Permits	1276,1277	
36-1-0251	EC-OS-6; Keswick South (Eulomogo)	GDA	55	656726	6426485	Open site	Valid	Artefact : -	Open Camp Site	4378
	Contact	Recorders	Central West Archaeological and Heritage Services Pty Ltd,OzArk Environmental a					Permits	1276,1277	
36-1-0252	EC-ST-1; Keswick South (Eulomogo)	GDA	55	656559	6427271	Open site	Valid	Modified Tree (Carved or Scarred) : -	Scarred Tree	4378
	Contact	Recorders	Central West Archaeological and Heritage Services Pty Ltd,OzArk Environmental a					Permits	1276,1277	
36-1-0253	EC-AG-2; Eulomogo Creek;	AGD	55	655150	6426670	Open site	Valid	Grinding Groove : -	Axe Grinding Groove	4378
	Contact	Recorders	Central West Archaeological and Heritage Services Pty Ltd					Permits	1276,1277	
36-1-0254	EC-AG-1; Eulomogo Creek;	AGD	55	655380	6426870	Open site	Valid	Grinding Groove : -	Axe Grinding Groove	4378
	Contact	Recorders	Central West Archaeological and Heritage Services Pty Ltd					Permits	1276,1277	
36-1-0154	Old Dubbo Rd	AGD	55	653120	6425750	Open site	Valid	Modified Tree (Carved or Scarred) : -	Scarred Tree	
	Contact	Recorders	Katrina Geering					Permits		
36-1-0213	K-ST-6	AGD	55	653640	6428240	Open site	Valid	Modified Tree (Carved or Scarred) : -	Scarred Tree	3350
	Contact	Recorders	Jim Kelton					Permits		
36-1-0179	Keswick-Scarred Tree-5 (K-ST-5)	GDA	55	653794	6429259	Open site	Destroyed	Modified Tree (Carved or Scarred) : -	Scarred Tree	3350
	Contact	Recorders	Central West Archaeological and Heritage Services Pty Ltd,OzArk Environmental a					Permits	3873	
36-1-0180	K-ST-4	AGD	55	654590	6428590	Open site	Valid	Modified Tree (Carved or Scarred) : -	Scarred Tree	3350
	Contact	Recorders	Central West Archaeological and Heritage Services Pty Ltd					Permits		

Report generated by AHIMS Web Service on 12/01/2017 for Chris Lovell for the following area at Datum :GDA, Zone : 55, Eastings : 652000 - 657000, Northings : 6425000 - 6430000 with a Buffer of 0 meters. Additional Info : Due diligence assessment. Number of Aboriginal sites and Aboriginal objects found is 26

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Office of Environment & Heritage NSW

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : 1545 Lot2DP880413#1
Client Service ID : 262045

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
36-1-0181	K-ST-3	AGD	55	654510	6428580	Open site	Valid	Modified Tree (Carved or Scarred) : -	Scarred Tree	3350
	Contact	Recorders	Central West Archaeological and Heritage Services Pty Ltd					Permits		
36-1-0182	K-ST-2	AGD	55	654220	6428870	Open site	Valid	Modified Tree (Carved or Scarred) : -	Scarred Tree	3350
	Contact	Recorders	Central West Archaeological and Heritage Services Pty Ltd					Permits		
36-1-0186	K-IF-2;	AGD	55	654630	6426680	Open site	Valid	Artefact : -	Isolated Find	3348
	Contact	Recorders	Jim Kelton					Permits		
36-1-0187	K-OS-2;	AGD	55	654770	6426650	Open site	Valid	Artefact : -	Open Camp Site	3348
	Contact	Recorders	Jim Kelton					Permits		
36-1-0188	K-OS-3;	AGD	55	654840	6426873	Open site	Valid	Artefact : -	Open Camp Site	3348,102800
	Contact	Recorders	Jim Kelton					Permits		
36-1-0189	K-OS-4;	AGD	55	653790	6426830	Open site	Valid	Artefact : -	Open Camp Site	3348
	Contact	Recorders	Jim Kelton					Permits		
36-1-0109	M16 Dubbo	AGD	55	652500	6425940	Open site	Valid	Modified Tree (Carved or Scarred) : 1	Scarred Tree	1065
	Contact	Recorders	N Franklin,Margrit Koettig,Rex Silcox					Permits		
36-1-0110	M17 Dubbo	AGD	55	652410	6425220	Open site	Valid	Modified Tree (Carved or Scarred) : 1	Scarred Tree	1065
	Contact	Recorders	N Franklin,Margrit Koettig,Rex Silcox					Permits		
36-1-0111	M18 Dubbo	AGD	55	651990	6425360	Open site	Valid	Artefact : 1000	Open Camp Site	1065
	Contact	Recorders	N Franklin,Margrit Koettig,Rex Silcox					Permits		
36-1-0665	DSD1 (RAAF-OS1)	GDA	55	652323	6429705	Open site	Valid	Artefact : 1		
	Contact	Recorders	Ms.Morgan Wilcox					Permits		
36-1-0666	RAAF-ST3	GDA	55	652764	6429580	Open site	Valid	Modified Tree (Carved or Scarred) : 1		
	Contact	Recorders	Ms.Morgan Wilcox					Permits		
36-1-0667	Scarred Tree 1 (RAAF-ST1)	GDA	55	652642	6429881	Open site	Valid	Modified Tree (Carved or Scarred) : 1		
	Contact	Recorders	Ms.Morgan Wilcox					Permits		

Report generated by AHIMS Web Service on 12/01/2017 for Chris Lovell for the following area at Datum :GDA, Zone : 55, Eastings : 652000 - 657000, Northings : 6425000 - 6430000 with a Buffer of 0 meters. Additional Info : Due diligence assessment. Number of Aboriginal sites and Aboriginal objects found is 26

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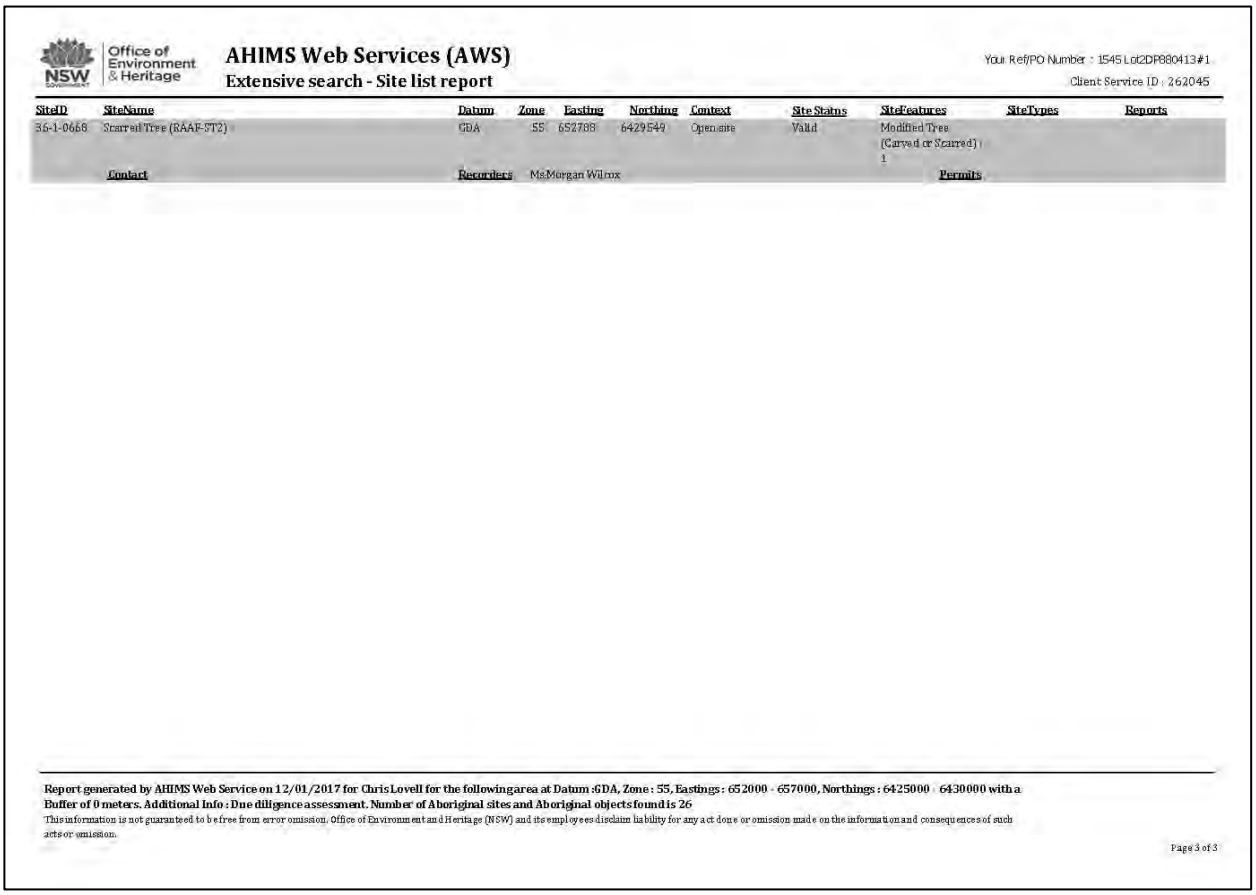

Office of Environment & Heritage

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : 1545 Lot2DP880413#1

Client Service ID : 262045

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
36-1-0668	Scarred Tree (RAAF-ST2)	GDA	55	652788	6429549	Open site	Valid	Modified Tree (Carved or Scarred) : 1		

Contact	Recorders	Ms Morgan Wilcox	Permits

Report generated by AHIMS Web Service on 12/01/2017 for Chris Lovell for the following area at Datum :GDA, Zone : 55, Eastings : 652000 - 657000, Northings : 6425000 - 6430000 with a Buffer of 0 meters. Additional Info : Due diligence assessment. Number of Aboriginal sites and Aboriginal objects found is 26

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Overview of the north bank of Eulomogo Creek, facing west

ECOLOGICAL ASSESSMENT: SUBDIVISION OF LOT 2 DP880413 SHERATON ROAD, DUBBO NSW

MARCH 2017

Report Prepared by

OzArk Environmental & Heritage Management Pty Ltd

For

MAAS Group Properties Pty Ltd

Environmental and Heritage Management P/L

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DOCUMENT CONTROLS

Proponent	MAAS Group Properties		
Client	MAAS Group Properties Pty Ltd		
Project No/Purchase Order No			
Document Description	Biodiversity Assessment Subdivision of Lot 2 DP880413, Dubbo NSW, Dubbo Regional LGA		
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Clients Reviewing Officer			
Clients Representative Managing this Document		**OzArk Person(s) Managing this Document**	
		Phil Cameron	
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Prepared For		**Prepared By**	
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EXECUTIVE SUMMARY

OzArk Environmental & Heritage Management was engaged by MAAS Group Properties to complete an ecology assessment for the proposed subdivision of Lot 2 DP880413 at 24R Sheraton Road, Dubbo NSW.

This investigation has been completed to fulfil the requirements of Part 4 of the *Environmental Planning and Assessment Act 197*9 (EP&A Act), to take into account all matters affecting or likely to affect the environment as a result of the proposal.

Field assessment of the Subject Site was undertaken by Phillip Cameron (Principal Ecologist of OzArk) on Friday 6 January 2017.

The majority of the Subject Site has continued or historical agricultural practices, infrastructure provision and low density rural housing. Satellite imagery of the Subject Site (**Figure 3-1**) demonstrates high levels of broad scale land clearance for grazing and cropping.

Grey Box (*Eucalyptus microcarpa*), Yellow Box (*E. melliodora*), Rough-barked Apple (*Angophora floribunda*) and Fuzzy Box (*E. conica*) are dominant trees along the Eulomogo Creek line in the Subject Site. This community was mapped by NSW OEH as PCT ID:81 Western Grey Box - cypress pine shrub grass shrub tall woodland in the Brigalow Belt South Bioregion (**Figures 3-1, 3-2 and Table 3-1**). Approximately 4.5ha of this area is considered to be the community and the majority occurs south of Eulomogo Creek.

The areas mapped by NSW OEH as PCT ID:45 Plains Grass grassland on alluvial mainly clay soils in the Riverina Bioregion and NSW South Western Slopes Bioregion in the Subject Site, were ground truthed as 'not native vegetation' (**Table 3-1**).

PCT ID:81 is an endangered ecological community listed in the NSW TSC Act (*Inland Grey Box Woodland*). This total EEC patch size (i.e. the same vegetation community that extends onto surrounding property) is 77.7 ha (determined by VIS map 4358) thus 5.9 percent of the local viable population is within the proposal.

The Commonwealth listed EEC with a similar name does not occur in the Subject Site as it's too weedy to meet the minimum quality criterion.

Eulomogo Creek forms part of the FM Act listing for the '*aquatic ecological community in the natural drainage system of the lowland catchment of the Darling River.'* The creek is in poor condition however provides connectivity to the Macquarie River.

This report assumes the NSW EEC will not be affected by the proposal. An Assessment of Significance has been completed to characterise the potential impacts and concluded it would not be significant. If the Inland Grey Box EEC is affected, where more than five percent of the

viable local population is cleared, then it would be a significant impact and a Species Imapct Statement and Biodiversirty Offsetting approved by NSW OEH would be needed.

No listed plants or animals were recorded during the assessment.

No ground water dependant ecological communities or trees with hollows will be affected by the proposal.

On the basis of regional records, reports and the presence of suitable habitat, 15 threatened items listed in the schedules of the TSC Act and / or EPBC Act that can used agricultural landscapes as habitat were assessed as likely to be affected by the Proposal (**Table 4-7**). Assessments of significance were conducted for these species (**Appendix 5**). Having given consideration to the ecology within the Subject Site, it is apparent that the Proposal is:

- unlikely to significantly affect any of the listed threatened species, fauna populations or communities.
- unlikely to augment or significantly contribute to any of the National or State listed Key Threatening Processes, if the appropriate safeguards regarding the control of potential vertebrate pests are effectively applied.
- unlikely to significantly affect any Ramsar wetland or any CAMBA, ROKAMBA or JAMBA listed species;
- unlikely to significantly affect local hydrology.
- consistent with ESD principles with regard to fauna, would not adversely affect the local biodiversity and no issue of inter-generational or value added matters are relevant in this instance.

The proposed activity should not be considered to constitute a significant impact and, as such, no Species Impact Statement (SIS) is warranted. No Koala Habitat Management Plan pursuant to SEPP 44 should be required.

CONTENTS

FIGURES

TABLES

1 INTRODUCTION

1.1 THE PROJECT

OzArk Environmental & Heritage Management was engaged by MAAS Group Properties to complete an ecology assessment for the proposed subdivision of Lot 2 DP880413 at 24R Sheraton Road, Dubbo NSW (**Figures 1-1** to **1-3**).

This investigation has been completed to fulfil the requirements of Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act), to take into account all matters affecting or likely to affect the environment as a result of the proposal.

Figure 1-1: Location Map and Subject Site.

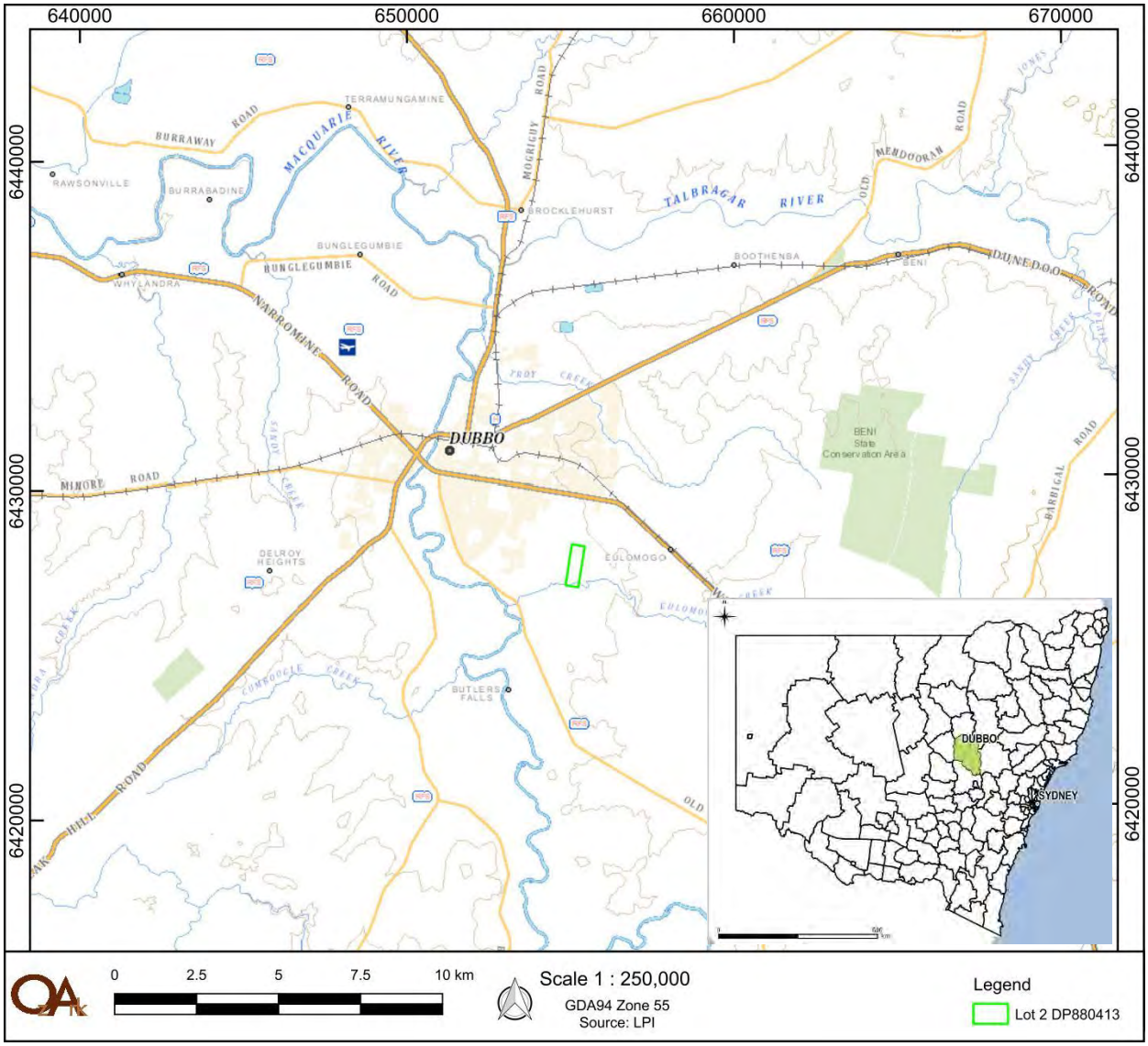
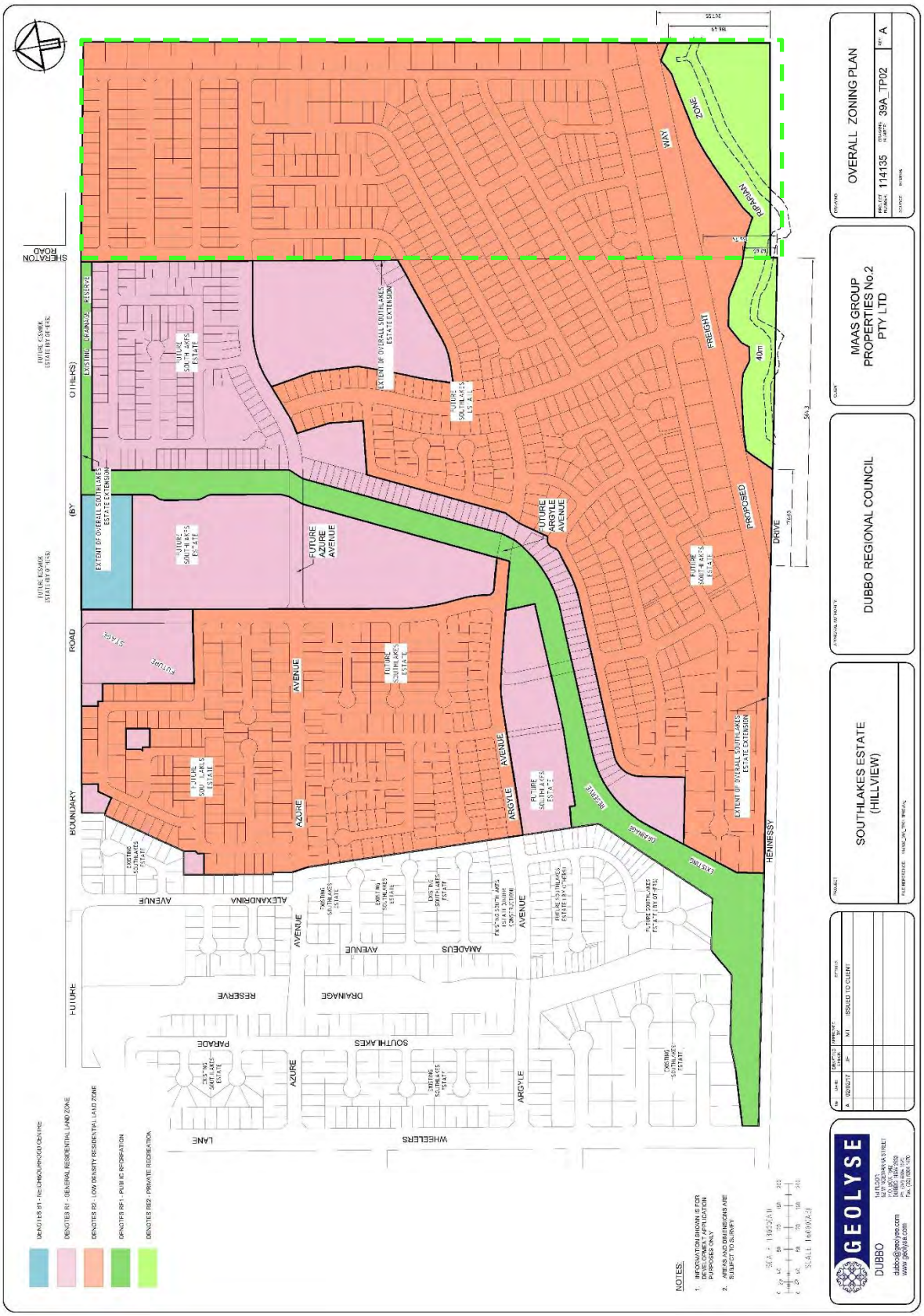


Figure 1-2: Map showing satellite imagery of the Subject Site (Lot 2 DP880413).

Figure 1-3: Map showing the lot layout for the proposed subdivision within the Subject Site (green dashed line).



1.2 LOCATION

The Subject Site is located in Central West NSW on Lot 2 DP880413, encompassing approximately 51 hectares of land, located approximately 4.7 kilometres southeast of the Dubbo CBD at 24R Sheraton Road (

Figure 1-2).

1.1 LEGISLATIVE CONTEXT

1.1.1 Environmental Planning and Assessment Act 1979

The *Environmental Planning and Assessment Act 1979* (EP&A Act) is the principal planning legislation for the state, providing a framework for the overall environmental planning and assessment of development proposals. Under the EP&A Act there are three distinctive processes, which are:

- Part 3.1 (Previously Part 3A) 'State Significant Infrastructure', which regulates specific types of 'Infrastructure' and requires an Environmental Assessment report to be prepared and submitted to the Department of Planning and Infrastructure for the Minister's approval;
- Part 4, which regulates 'development' requires a development application to be accompanied by an Environmental Impact Statement 'prepared by or on behalf of the applicant in the form prescribed by the regulations.'
- Part 5, which regulates 'activities' and requires a REF for determination by a state self-determining authority.

The proposal is to be undertaken by MASS, under Part 4 of the Act. This ecological assessment and report will support a Development Application to Dubbo Regional Council for Approval.

1.1.2 Environment Protection and Biodiversity Conservation Act 1999

The *Environmental Protection and Biodiversity Conservation Act 1999* protects nationally and internationally important flora, fauna, ecological communities and heritage places, which are defined in the EPBC Act as matters of national environmental significance. Matters of national environmental significance relevant to biodiversity are:

- Wetlands of international importance.
- Nationally threatened species and ecological communities.
- Migratory species.
- Commonwealth marine areas.

Significance of impacts is determined in accordance with the *Significance impact guidelines 1.1– matters of national environmental significance* (Department of Environment, Water, Heritage and the Arts, 2006).

Where a proposal is likely to have a significant impact on a matter of national environmental significance, the proposal is referred to the Commonwealth Environment Minister via the Department of the Environment and Energy (DoEE). The Minister then determines whether the proposal is a 'controlled action'. If a proposal is declared a controlled action, an assessment of the action is carried out and the Minister makes a decision to approve, approve with conditions, or not approve the proposed action. A requirement for biodiversity offsetting is triggered in controlled actions.

1.1.3 Other Relevant legislation, Plans and Policies

A summary of applicable environmental legislation have been provided in **Table 1-1**.

Table 1-1: Environmental considerations.

Environmental considerations	Comment
An area reserved or dedicated under the *National Parks and Wildlife Act 1974*?	No
Is the proposal located within land reserved or dedicated within the meaning of the Crown Lands Act 1989 for preservation of other environmental protection purposes?	No
A World Heritage Area?	No
Environmental Protection Zones in environmental planning instruments?	No
Lands protected under SEPP 14 – Coastal Wetlands?	No
Lands protected under SEPP 26 – Littoral Rainforests?	No
Lands protected under SEPP 71 – Coastal Protection?	No
Lands protected under SEPP 44 – Koala Protection?	No
Lands protected under SEPP - Sydney's drinking water?	No
Land identified as wilderness under the *Wilderness Act 1987* or declared as wilderness under the *National Parks and Wildlife Act 1974*?	No
Aquatic reserves dedicated under the *Fisheries Management Act 1994*?	No
Wetland areas dedicated under the Ramsar Wetlands Convention?	No
Land subject to a conservation agreement under the *National Parks and Wildlife Act 1974*?	No
Land identified as State Forest under the *Forestry Act 1916*?	No
Western Lands Lease	No
Freehold or Crown Land. If Crown Land, what type?	Freehold
Land within a mining subsidence district?	No
Acid sulphate area?	No
Protected riparian habitat?	**Yes**
Critical habitat NSW?	No
Critical habitat nationally?	No

Table 1–2 summarises relevant ecological approvals or licenses required from State or National bodies prior to undertaking the works.

Table 1-2: Summary of other relevant legislation, licensing and approval required.

Act	Authority	Requirements
NSW *Threatened Species Conservation Act 1995* (TSC Act)	Office of Environment & Heritage (OEH)	This act aims to conserve biological diversity, promote ecologically sustainable development, prevent extinctions and promote recovery of threatened entities, protect critical habitat, assess the impacts of actions on, and encourage the conservation of, threatened entities. An assessment of the potential impacts of the Proposal on threatened species, populations, ecological communities and critical habitat listed on the TSC Act must be undertaken in accordance with section 5A of the EP&A Act (7-part test).Where a significant impact is likely to occur a Species Impact Statement (SIS) must be prepared for projects assessed under Part 4 and Part 5 of the EP&A Act. The content of a SIS is outlined in Sections 110–112 of the Threatened Species Conservation Act 1995 (TSC Act) and includes requesting Director-General's requirements.
Native Vegetation Act 1997 (NV Act)	OEH	The Native Vegetation Act 2003 (NV Act) regulates the clearing of native vegetation on all land in NSW. The NV Act requires development approval from the Central West Local Land Services for the clearing of any native vegetation. Currently, it is illegal to remove or damage vegetation, without a permit, from within 40 metres of the banks of nominated waterways in NSW (Category B Riparian Land, State Protected Land or SPL). As this project will be assessed under Part 4 of the EP&A Act, the NVA Act applies.
Noxious Weeds Act 1993 (NW Act)	NSW Department of Primary Industries (NSW DPI)	The Noxious Weeds Act 1993 (NW Act) guides the management of declared noxious weeds within Local Government Areas (LGAs) and provides for a coordinated approach to the removal and control of scheduled noxious weeds across the State. Individual land holders and managers are required under the NW Act to control noxious weeds declared for their area according that have been proclaimed under the NW Act. A list of declared noxious weeds for the Dubbo LGAs is provided in **Appendix 1**. In addition to the NW Act, an effort to gain control of weeds in Australia led to the development of a National Weeds Strategy. The strategy was first developed in 1997 and further refined in 2007 by the Commonwealth of Australia and issued under the authority of the National Resource Management Ministerial Council. Detailed management procedures have been outlined under the strategy and published for the control of 21 of the 32 recognised Weeds of National Significance (WoNS). WoNS are recognised as having potential to cause a significant impact upon natural values including: threats to human health and safety; threats to pastoral and agricultural industries; threats to water quality and supply; threats to indigenous flora; and threats to biodiversity and cultural values. A list of WoNS known or predicted to occur in the Subject Site has been provided in the Appendices.
Fisheries Management Act 1994 (FM Act)	DPI and OEH	The objective of the Fisheries Management Act 1994 Act (FM Act) is to conserve, develop and share the fishery resources of the State for the benefit of present and future generations. The developer will need to obtain a 'whole of project permit' to engage in a dredging (trenching) and reclamation activity (section 199, Part 7, Div 3 of the FM Act 1994) for the purpose of rehabilitation within the banks of the Eulomogo Creek in Subject Site. Under the 'integrated development' provisions of the *NSW Environmental Planning and Assessment Act 1979*. The developer will need to seek approval from DPI for a permit to temporarily or permanently block fish

Act	Authority	Requirements
		passage (section 219, of the FM Act 1994). If required, allow eight weeks to obtain this permit.
NSW National Parks and Wildlife Act 1974 (NP&W Act)	OEH	The NP&W Act aims to conserve nature, habitat, ecosystems, ecosystem processes and biological diversity at the community, species and genetic levels. Under this Act all native fauna is protected, threatened or otherwise. Schedule 13 of the act lists protected plants which shall not be harmed or picked on any land either on or off National Park estate. With regard to threatened species a person must not: a) harm any animal that is of, or is part of, a threatened species, an endangered population or an endangered ecological community, or b) use any substance, animal, firearm, explosive, net, trap, hunting device or instrument or means whatever for the purpose of harming any such animal.
Water Management 2000 (WM Act)	NSW Office of Water (NoW)	The WM Act provides for the protection of river and lakeside land in NSW and aims to provide for the sustainable management of the water sources throughout NSW. All controlled development on or under waterfront land is regulated by the Act. The Act aims to minimise impacts on waterfront land and water courses and requires buffer zone, called the riparian corridor, between the waterfront and the adjacent development. NoW administers the WM Act and is required to assess the impact of any proposed controlled activity to ensure that no more than minimal harm will be done to waterfront land as a consequence of carrying out the controlled activity. Waterfront land includes the bed and bank of any river, lake or estuary and all land within 40 metres of the highest bank of the river, lake or estuary. The Subject Site borders Eulomogo Creek and may require a permit under WM Act. A water access licence may be required under the WM Act prior to commencement of works if water is to be sourced from a creek or a river (for water trucks etcetera). Allow a minimum of 28 days prior to the commencement of the works.
Water Act 1912	NoW	There are still some provisions in the Water Act 1912 that are yet to be incorporated into the WM Act. Under Part 8 of the Act, approval is required for a "controlled work". A "controlled work" is defined as an earthwork, embankment or levee or any work proposed to be constructed, on land that form part of a bank of a river or is within a designated floodplain and that is declared by order of the Ministerial Corporation published in the Gazette to be a controlled work. The subdivision will occur on the edges of the Macquarie River floodplain. Under Part 4 of the EPA Act, the developer may be required to submit a Controlled Works Application to NoW. Seek further advice from this department.
SEPP44 – Koala Habitat Protection	NSW Planning & Environment	This Policy aims to encourage the proper conservation and management of areas of natural vegetation that provide habitat for koalas to ensure a permanent free-living population over their present range and reverse the current trend of koala population decline: • by requiring the preparation of plans of management before development consent can be granted in relation to areas of core koala habitat, and • by encouraging the identification of areas of core koala habitat, and • by encouraging the inclusion of areas of core koala habitat in environment protection zones. SEPP 44 aims to identify areas of potential and core Koala Habitat. These are described as follows:

Act	Authority	Requirements
		• Core Koala Habitat is defined as an area of land with a resident population of Koalas, evidenced by attributes such as breeding females, and recent and historical records of a population. • Potential Koala Habitat is defined as areas of native vegetation where the trees listed in Schedule 2 of SEPP 44 constitute at least 15% of the total number of trees in the upper or lower strata of the tree component. SEPP 44 does not apply to the Dubbo Local Government area, however Koala habitat still requires consideration.
Local Environmen t Plan	Dubbo Regional Council	The Subject Site is zoned as R2 (Low density residential). The application of ISEPP does not override the need to consider zoning controls under a LEP.
National Wildlife Corridors Plan	DoE	Works have been assessed against the types of biodiversity links (wildlife corridors) defined in of the National Wildlife Corridors Plan. Mitigation and redesign in sensitive ecological areas would be recommended to avoid large scale clearing. Offsets and rehabilitation will be consistent with this plan.

Biodiversity offsetting policies

Biodiversity offsets may be required as a condition of approval or a concurrence under the NSW EP&A Act or the EPBC Act. Both State and National levels of government aim to 'maintain, enhance or improve biodiversity', through the developer.

Following consultation with Dubbo Regional Council (DRC), offsetting is required by Council. DRC are currently developing offsetting policies. To ensure offsetting is consistent with Councils requirements, this chapter was written taking into consideration their feedback to date.

Offsets would demonstrate an 'improve or maintain' outcome. Offsets are best directed at improving the habitat for all threatened species and connectivity to remnants. Plants used for revegetation would be consistent with those locally occurring in the Subject Site and would improve Eulomogo Creek bank stability, address erosion and assist in managing salinity.

DRC Offsetting Objectives

To meet offsetting requirements the offsetting package would:

- improve creek structural stability, and the condition and extent of native vegetation suitable for listing as a NSW EEC (Fuzzy Box, Box-gum Woodland, Inland Grey Box Woodland). The *Water Management Act 2000 Guidelines for controlled activities* (2008) would be used as a guide for works within the proposed waterway the end result.
- maintain or improve the extent, distribution and condition of the existing native vegetation in the offset area.
- support the recovery of priority fauna populations, and threatened species, populations and communities.

DRC Offsetting Principles

The following principles would be considered when developing biodiversity offsets:

1. Offsets will be used as a last resort, after consideration of alternatives to avoid and/or mitigate impacts.
2. Offset areas be kept within the Dubbo Regional Government Area (either wholly or in part – as a contiguous area of native vegetation).
3. Council stipulate the offset area will be publically accessible.
4. Offsets must be of the same vegetation type and be at least the size, equivalent biodiversity value and configuration of the vegetation lost through development and be additional to existing native vegetation areas.
5. Offsetting must achieve biodiversity benefits in perpetuity and be registered on title.
6. Offset conditions must be monitored, enforceable, clearly mapped, recorded and publicly available.
7. An offset area, once designated, cannot be used for offsetting of subsequent developments in future.

1.2 STUDY AIMS

The scope and aims of this report are to:

- Determine biodiversity values of the Subject Site including identifying protected and threatened flora and fauna species, populations and ecological communities and their habitats.
- Identify the ecological constraints of the proposal.
- Identify the impacts of the proposed activity on flora and fauna species, populations, ecological communities and critical habitat.
- Address the requirements of the relevant legislation including the EP&A Act, the TSC Act and the EPBC Act.
- Assess the significance of the impact of the proposed activities on species, ecological communities and populations listed under the TSC Act and EPBC Act.
- Propose environmental management measures to minimise, mitigate and if necessary offset impacts.

2 METHODOLOGY

The flora and fauna assessment has been completed in accordance with Section 5a of the EP&A Act and the EPBC Act for threatened species populations and ecological communities potentially affected by the proposal.

The methodology employed for this report consisted of:

- A desktop and literature review of ecological databases and literature sources as direct references for the survey undertaken.
- A field survey of the Subject Site.

2.1 PERSONNEL

2.1.1 Field assessment

Field assessment of the Subject Site was undertaken by Phillip Cameron (Principal Ecologist of OzArk) on 6 January 2017.

2.1.2 Reporting

Reporting components were completed by:

- Main Author: Phillip Cameron
- Editor: Jane Book
- QMS: Phillip Cameron

2.1.3 Licensing and qualifications

OzArk operates under NSW Department of Primary Industries (DPI) Ethics Approval No 11/5475 and NSW Scientific Research License 101087. Key details of scientific personnel from OzArk EHM are provided in **Table 2–1**.

Table 2-1: Summary of OzArk qualifications.

Name	Position	CV Details
Phil Cameron	Principal Ecologist Senior Project Manager	• BSc. Major in Biology. Macquarie University. • Ass Dip App Sci. University of Queensland. • Certified Environmental Practitioner (EIANZ). • Lean Six Sigma Certificate (Sydney Uni) • OEH BioBanking and Bio-certification Assessor: accreditation number 0117 • OEH Scientific License: 101087. • NSW DPI Ethics Approval 11/5475. • Practicing member of the NSW Ecological Consulting Association. • Practicing member of the Environment Institute of Australia and New Zealand (EIANZ) Member. • National Railtrack Safety Induction (ARTC and John Holland Inductions).

Name	Position	CV Details
		• WHS White Card and Blue Card. • Apply First Aid (Parasol) ID: 6007221.
Jane Book	Environmental Scientist	• Masters of Environmental and Business Management (Newcastle Uni) • Graduate Certificate in Environmental and Business Management • Bachelor of Applied Science (Hons) • Member Royal Zoological Society, National Trust, NSW Ecological Consulting Association

2.2 DATABASE SEARCHES AND LITERATURE REVIEWS

Preliminary assessments drew on a number of information sources including previous preliminary reporting and information held on government databases and archives. Data was used to assist in identifying distributions, suitable habitats and known records of threatened species to guide field investigations. Information sources included:

- Aerial Photograph Interpretation (API) of the landscape and previous vegetation maps.
- Literature reviews to determine vegetation and species habitat(s) within the proposed Subject Site and environs.
- Review of flora and fauna records contained in the OEH Threatened Species Database, EPBC Protected Matters Search and DPI Records Viewer.
- NSW Wildlife Atlas/Bionet GIS data request and website search.
- Australia Museum records.
- Royal Botanical Gardens (PlantNet NSW Flora Online).
- NSW Atlas of Living Australia records.
- Birds Australia Atlas.

2.3 PREDICTIVE MODEL FOR THREATENED SPECIES DETECTION

The concepts of the modelling formed the basis of the methodology designed for the current assessment. These reflect the predominant patterns of threatened species distribution as elicited from prior survey work.

Remnant patch size is the primary factor appearing to determine the location of threatened plants and animals in the region and to a lesser degree in disturbed habitats proximity to a permanent water supply. Predictive modelling for EECs in the locality is fairly straight forward as it can be summarised as likely to be any native vegetation left in the valley floor and on the undulating hills which is suitable for cropping or grazing agriculture.

An assessment of likelihood of occurrence was made for threatened species of flora, fauna, populations, ecological communities and migratory species identified from the database searches

identified in **Section 2.2**. Five terms for the likelihood of occurrence of species are used in this report. This assessment was based on database or other records, presence or absence of suitable habitat, features of the proposal site, results of the field survey and professional judgement. The terms for likelihood of occurrence are defined below:

- "Yes" = the species was or has been observed on the site.
- "Likely" = a medium to high probability that a species uses the site.
- "Potential" = suitable habitat for a species occurs on the site, but there is insufficient information to the species as likely to occur, or unlikely to occur.
- "Unlikely" = a very low to low probability that a species uses the site.
- "No" = habitat on-site and in the vicinity is unsuitable for the species.

The background searches detailed in **Section 2.2 (Appendix 2)** enabled a predictive model of threatened flora and fauna occurrence to be developed for the Subject Site (**Section 4.1.5**).

The ecology and habitat requirements of threatened species, populations, and endangered ecological communities and the likelihood of those occurring within the Project Area are detailed in **Appendix 3**.

2.4 FIELD SURVEY

2.4.1 General survey methodology

The survey methods employed during the field investigations in the Subject Site were based on relevant recovery and threat abatement plans and the following documents:

- Threatened Species Survey And Assessment: Guidelines for Developments and Activities- Working Draft (DEC 2004).
- Field Survey Methods (DECCW 2009).
- Survey guidelines for Australia's threatened birds: Guidelines for detecting birds listed as threatened under the EPBC Act (DEWHA 2010a).
- Survey guidelines for Australia's threatened bats: Guidelines for detecting bats listed as threatened under the EPBC Act (DEWHA 2010b).
- Survey guidelines for Australia's threatened mammals: Guidelines for detecting mammals as threatened under the EPBC Act. (DEWHA 2010c).
- Survey guidelines for Australia's threatened frogs: Guidelines for detecting frogs listed as threatened under the EPBC Act (DEWHA 2010d).

2.4.2 Floristic survey methods

During the desktop assessment phase about six hectares of native vegetation was predicted to remain on the property (the rest had been ploughed for agriculture) and subsequently three vegetation plots were undertaken following Biobanking Assessment Methodology (2014). Plot details are as follows:

- Plot 1 (GDAz55 654777E,6426906N). This plot was within grassy woodland mapped as native vegetation.
- Plot 2 (GDAz55 654675E,6426910N). This plot was within a grassland area mapped as native vegetation.
- Plot 3 (GDAz55 654930E,6426869N). This plot was within a grassland area mapped as native vegetation.

Additional survey of the Subject Site followed the "Random Meander Technique" described by Cropper (1993). Special consideration was given to locating rare or threatened plants identified as having the potential to occur in **Appendix 2**.

Plant Identification

Plant identification followed nomenclature in Harden 1990–2002, Cunningham et al. 1992, Royal Botanic Gardens (RBG 2014a), and PlantNet NSW Flora Online (RBG 2014b). The national conservation significance of flora was determined by referencing *Rare or Threatened Australian Plants* (ROTAP) (Briggs and Leigh 2006) and the Schedules associated with the TSC Act or the EPBC Act.

2.4.3 Fauna survey methods and habitat assessment

A general habitat assessment was carried out to assess habitat features such as the presence of hollow bearing trees, logs and the potential for suitable habitat to provide breeding, nesting, feeding and roosting resources for native species.

Opportunistic fauna observations and targeted searches were carried out during the field survey to identify cryptic species in the Subject Site. Fauna identification was achieved via:

- Identification of scats, diggings, tracks and other traces.
- Direct observation: ie bird watching.
- Ground, leaf litter and other refuge searches.
- Searches for indirect evidence of mammals (vocalisation, tracks, scats, burrows etc.).
- Targeted assessment – Pink-tailed Worm Lizard

Fauna species identification

All fauna was readily identified through the use of available standard references (Strahan, R. [ed.] 1983 Groves *et al.* 2005).

2.4.4 Hollow bearing trees

Habitat values of trees assessed in the Subject Site were considered for their potential to provide habitat for the regions hollow dependant threatened fauna.

2.5 SURVEY EFFORT

All areas mapped as native vegetation or thought to possess native vegetation was assessed on foot. All trees with hollows inside the Subject Site were assessed and considered. Ploughed paddocks were not accessed unless it was essential to do so to determine if native vegetation was present.

Where ground debris or rocks were present they were overturned to search for frogs and reptiles in these areas. A targeted Pink-tailed Worm-Lizard search was undertaken in the area mapped as native vegegation but ground truthed as 'not native vegetation' (**Figure 3-1**). This area has basalt outcrops and suitable surface rocks. Approximately 300 rocks were overturned in this area as per EPBC Act survey guidelines for this species.

All native trees were assessed for evidence of Koala use.

2.6 LIMITATIONS

Not all animals and plants can be fully accounted for within any given Subject Site. The presence of threatened species is not static. It changes over time, often in response to longer term natural forces that can, at any time, be dramatically influenced by man-made disturbance. As such, the 'precautionary approach' for species occurrence has been adopted where required.

The above-mentioned constraints are not considered to compromise the scientific rigour of the field assessment.

3 EXISTING ENVIRONMENT

3.1 LANDSCAPE CONTEXT

The majority of the Subject Site has continued or historical agricultural practices, infrastructure provision and low density rural housing. Satellite imagery of the Subject Site (**Figure 3-1**) demonstrates high levels of broad scale land clearance for grazing and cropping. The Land Use mapping provided by the NSW government shows the areas as 'grazing' (**Figure 3-3**), this map is probably dated or incorrect.

3.2 CLIMATE OF THE SUBJECT SITE

The Subject Site experiences warm to very warm (hot) summers, and has an average rainfall of 590 millimetres, which occurs throughout the year. The average maximum temperature is 33.2 degrees Celsius and the average minimum temperature 18.2 degrees (Bureau of Meteorology 2017).

3.3 TOPOGRAPHY AND GEOLOGY

Low hills with long slopes characterise the locality. The Subject Area is located on the undulating plain above the Macquarie River floodplain at approximately 270m Australian Height Datum (AHD) in the south to 280m AHD in the north with the highest point (mapped as native vegetation but ground truthed as 'cropped paddock') being 290m AHD on the northwestern boundary (**Figure 3-2**).

3.4 VEGETATION

Grey Box (*Eucalyptus microcarpa*), Yellow Box (*E. melliodora*), Rough-barked Apple (*Angophora floribunda*) and Fuzzy Box (*E. conica*) are dominant trees along the Eulomogo Creek line in the Subject Site. This community was mapped by NSW OEH as PCT ID:81 Western Grey Box - cypress pine shrub grass shrub tall woodland in the Brigalow Belt South Bioregion (**Figures 3-1, 3-2 and Table 3-1**). Approximately 4.5ha of this area is considered to be the community and the majority of it occurs south of Eulomogo Creek.

The areas mapped as PCT ID:45 Plains Grass grassland on alluvial mainly clay soils in the Riverina Bioregion and NSW South Western Slopes Bioregion, were ground truthed as 'not native vegetation' (**Table 3-1**).

3.1 GROUND WATER DEPENDENT COMMUNITIES

Land along Eulomogo Creek is mapped as having a moderate potential for groundwater interaction.

3.2 MITCHELL LANDSCAPES AND SOIL OF THE SUBJECT SITE

Mitchells Landscapes in Subject Site includes "Goonoo Slopes" and "Dubbo Basalts" (**Figure 3-4**).

Goonoo Slopes are characterised by extensive undulating to stepped low hills with long slopes on sub-horizontal Triassic/Jurassic quartz sandstone, conglomerates, siltstone, shale and some coal. Stony yellow earths with sandstone outcrop on ridgelines to yellow harsh texture-contrast soils in shallow valleys (Mitchell 2002).

The Dubbo Basalts landscape unit includes slightly elevated plains and low hills on flat lying Tertiary basalt and trachyte flows, roughly parallel to the present course of the Macquarie River, with local relief to 10 metres. The Macquarie Alluvial Plain landscape unit is a plain associated with the Macquarie River main alluvial fan and distributary stream system with local relief of one to three metres.

3.1 HYDROLOGY OF THE SUBJECT SITE

The Subject Site is within the Talbragar Valley sub region of the Central West Catchment Management Area (CMA) situated within the larger Brigalow Belt South Bioregion (BBSB) (Thackway and Cresswell 2000). Eulomogo Creek transects the southern portion of the Subject Site. One small dam also exists on the southern portion of the Subject Site. All surface water drains south into adjoining agricultural / disturbed land and into the Macquarie River approximately 1.2 kilometres to the south.

Figure 3-1: Vegetation map (aerial background).

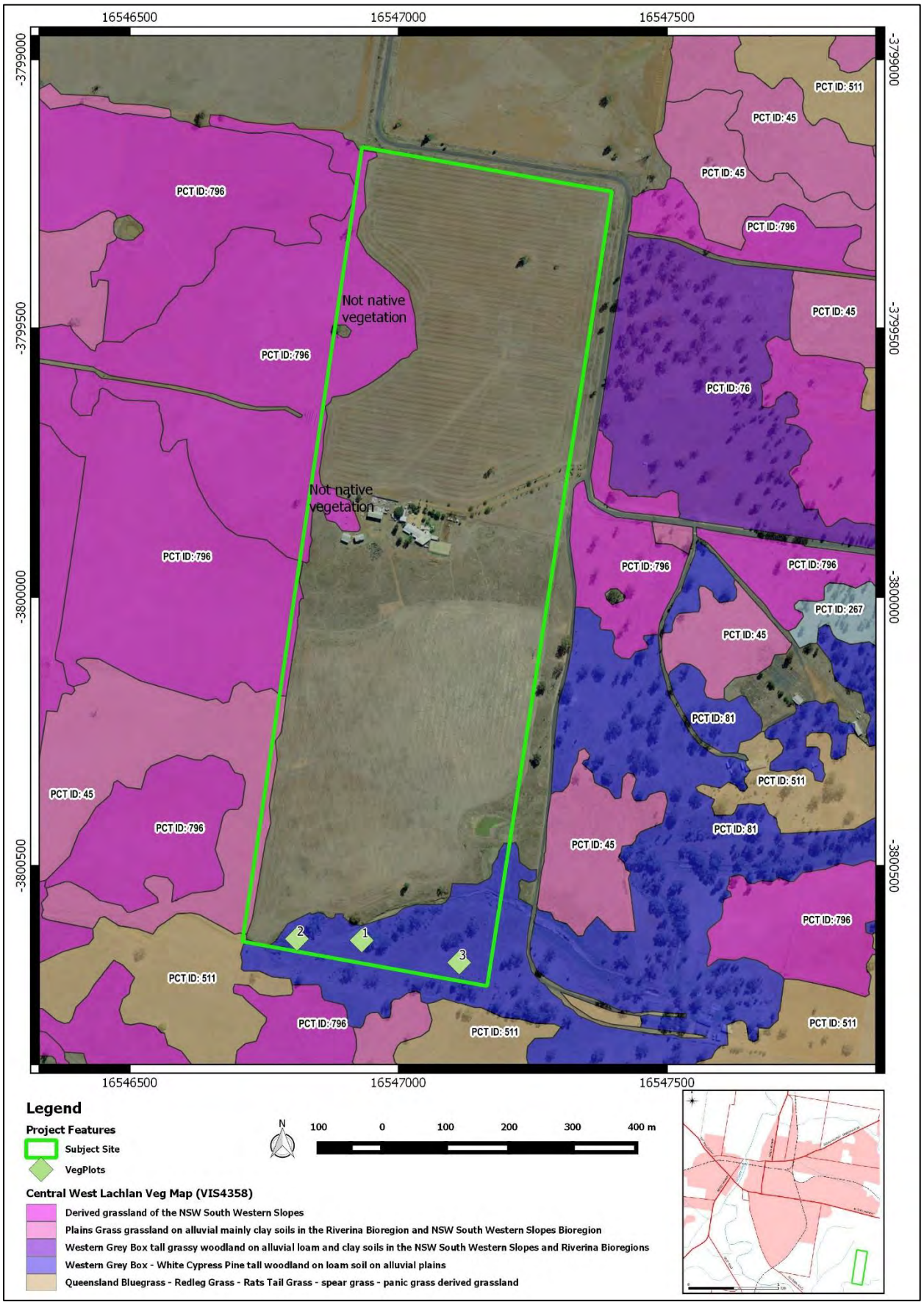


Figure 3-2: Topography of the Subject Site.

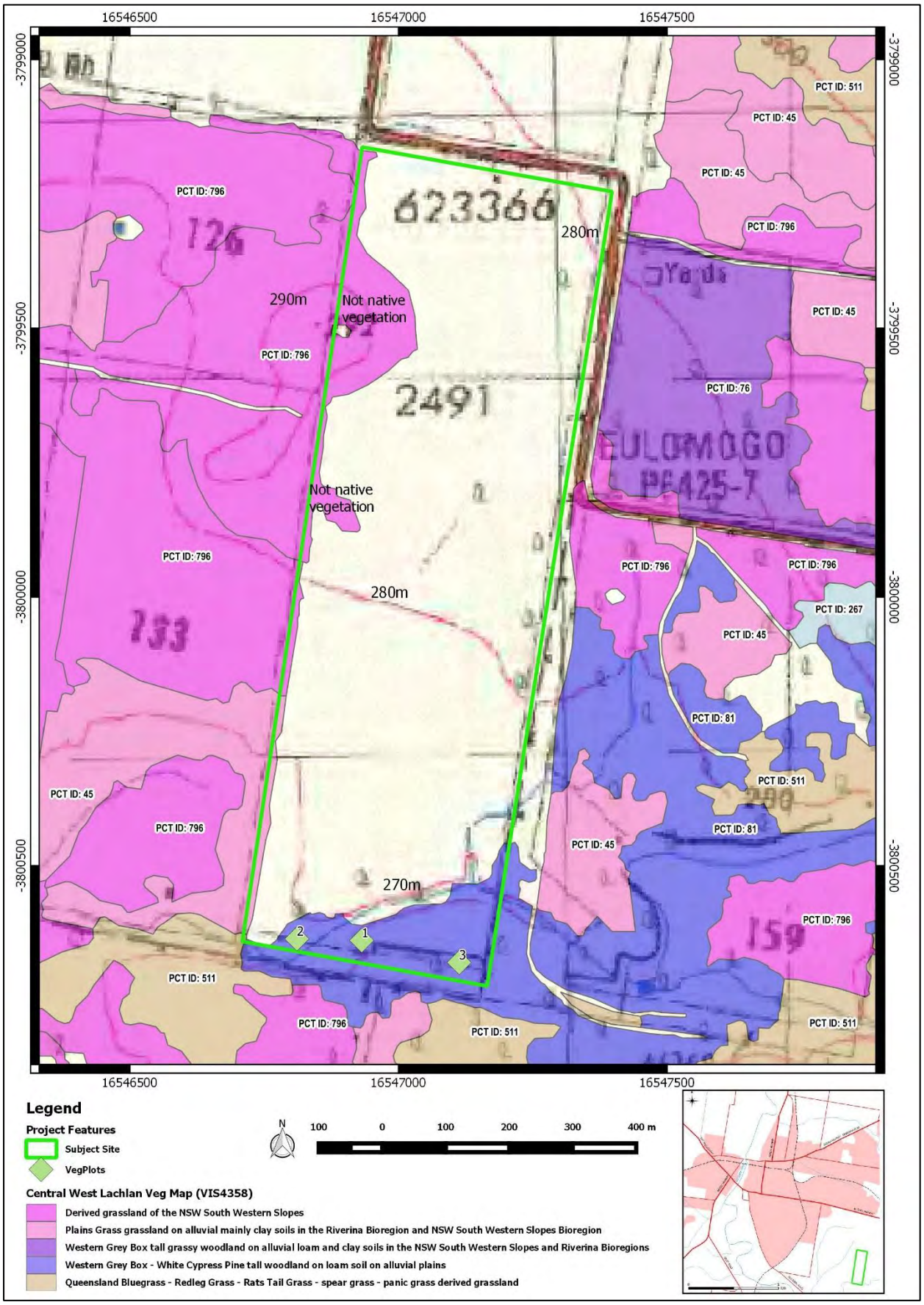


Figure 3-3: Map showing land use in the Subject Site.

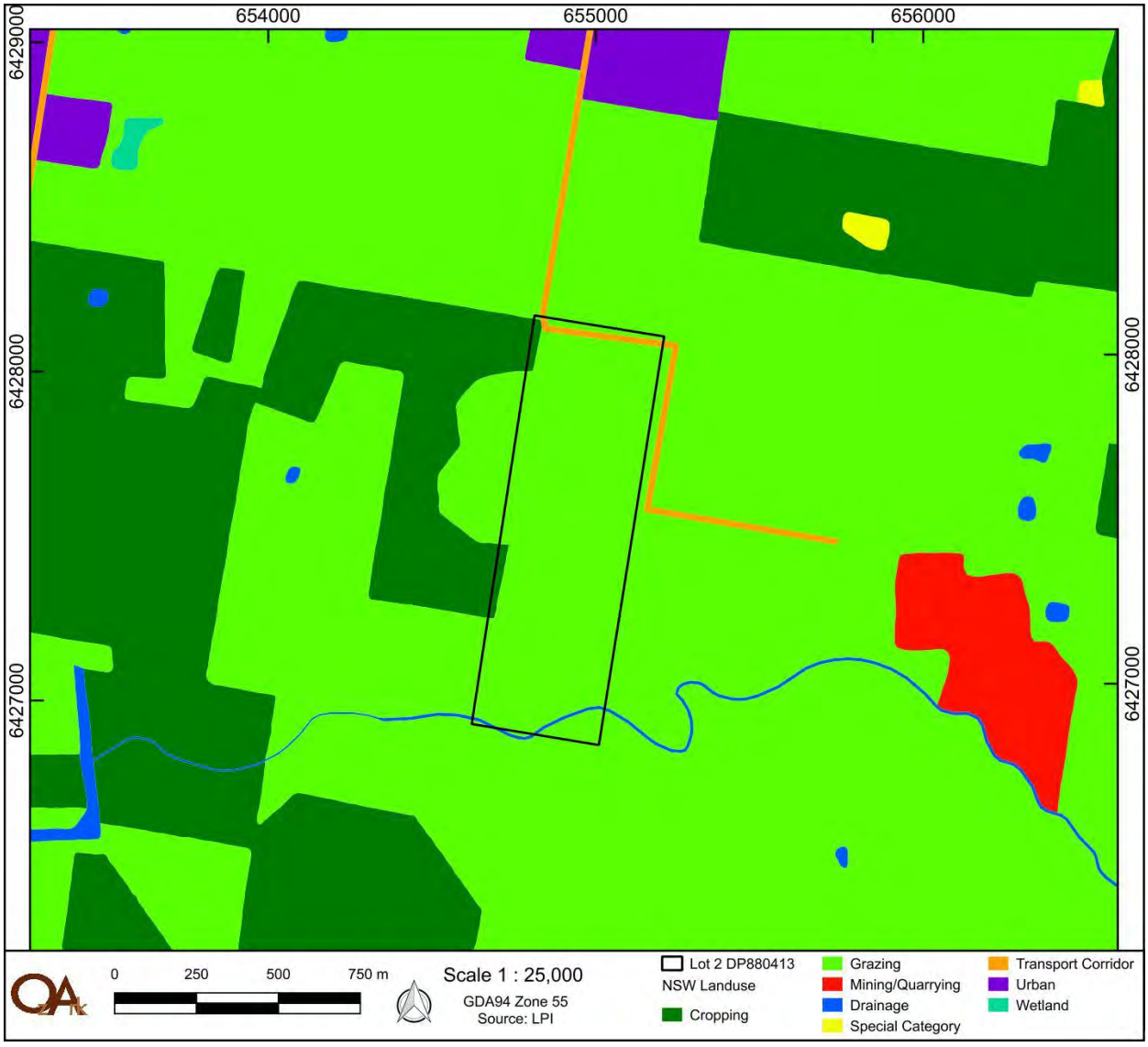
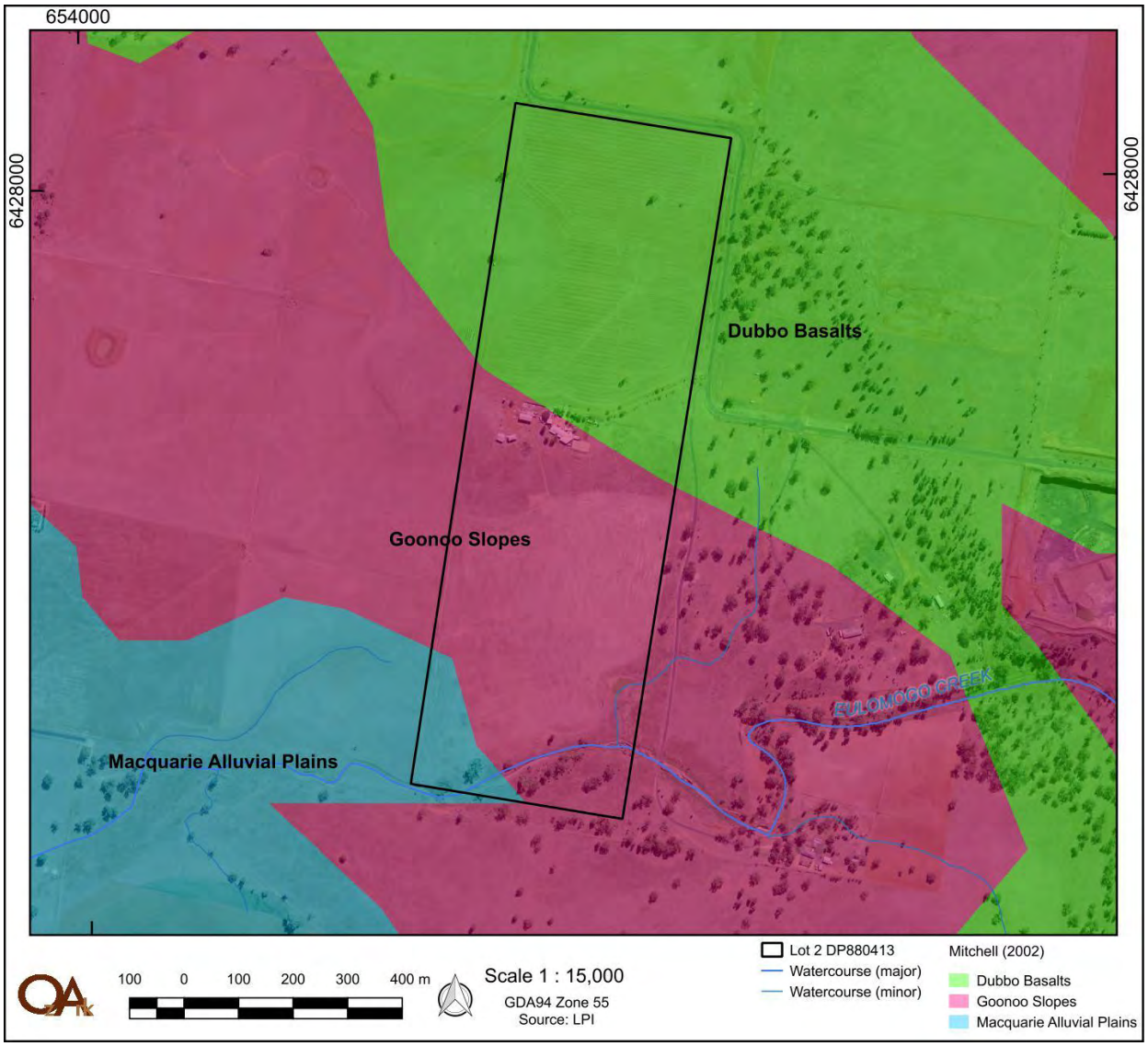


Figure 3-4: Mitchell's Landscapes in the Subject Site



3.2 LAND-USE

Examination of satellite imagery and visual inspection of the Subject Site confirmed the area has been cleared of vegetation, although some remnant trees exist in the southern and south-eastern portion, adjacent to Eulomogo Creek. House, shed and driveway construction has occurred in the central parts of the Subject Site (**Table 3-1**). The Subject Site is composed of several fenced paddocks that have undergone prolonged grazing. Visual inspection confirmed that the large northern and southern paddocks have been ploughed. Two low voltage powerlines and an earthen dam have been constructed in the southeast corner of the Subject Site. Most of the Subject Site therefore falls under the NPW Regulation definition of 'disturbed land', with the exception perhaps of: a low hill along the north western boundary (no native vegetation was recorded in this area); some areas to the east and west of the house and sheds; and the south eastern parts of the Subject Site in the vicinity of Eulomogo Creek.

Table 3-1: Landscapes in the Subject Site

		PCT ID:81 Western Grey Box - cypress pine shrub grass shrub tall woodland in the Brigalow Belt South Bioregion
		Paddocks south of the house not mapped as native vegetation
		Paddocks north of the house not mapped as native vegetation. The photo showing the tree on the adjoining property was mapped as native vegetation but at ground truthing it wasn't.

3.3 BIODIVERSITY LINKS (WILDLIFE CONNECTIVITY CORRIDORS)

Fauna wildlife corridors are usually associated with waterways, wetlands and riverine environments or specific continuous habitats (for example escarpments, woodlands).

The Subject Site is situated central to several protected forests and reserves including Beni State Conservation Area, Cobbora State Forest, Goonoo National Park, Goonoo State Conservation Area (SCA), Yarindury State Forest. Regionally the habitat surrounding within the Subject Site is likely to provide a movement pathway or stepping stone habitat between these reserves and the Macquarie River.

Goonoo SCA is recognised as an Important Bird Area (IBA) by Birdlife International (http://www.birdlife.org/worldwide/index.html). It is the core conservation area of the Mallee Fowl, Ground Cuckoo-shrike, Gilberts Whistler, Chestnut-rumped Heathwren, Spotted Quail-Thrush,

Glossy Black Cockatoo and one of only two known populations of Eastern Pygmy Possum on public land in the region. Goonoo is also a regional stronghold of the vulnerable Greater Long-eared Bat (Ellis & Turbill, 2002).

Consequently, Goonoo SCA is considered a significant environmental feature of the Central West, and arguably one of the more significant environmental features of inland NSW. It provides connectivity for migrating birds between the semi-arid lands to the west and hinterland (and coast) to the east.

The Subject Site has connectivity along Eulomogo Creek but little elsewhere on the property.

4 RESULTS

4.1 DATABASE AND LITERATURE RESULTS

Appendix 1 provides a complete list of database searches and lists of threatened flora, fauna and ecological communities identified through the background searches and annotated with the potential to be recorded in the Subject Site. A map displaying threatened flora and fauna records for the Subject Site can be seen on **Figure 4-1**.

4.1.1 NSW OEH Listed items

A search of the NSW OEH Threatened Species Profiles using Central West CMA Talbragar Valley subregion predicts 98 listed items as having potential to be present in the Subject Site.

Table 4-1: NSW OEH Listed items predicted to occur in the Central West CMA Talbragar Valley subregion.

NSW OEH Threatened Species	Known	Predicted	Total
Animal > Amphibians		1	1
Animal > Bats	3	1	4
Animal > Birds	29	9	38
Animal > Marsupials	4	2	6
Animal > Reptiles		1	1
Community > Threatened Ecological Communities	3		3
Plant > Epiphytes and Climbers	1		1
Plant > Herbs and Forbs	2	1	3
Plant > Orchids	1		1
Plant > Shrubs	6		6
Threat > Disease		3	3
Threat > Habitat Loss/Change		9	9
Threat > Other Threat		1	1
Threat > Pest Animal		14	14
Threat > Weed		7	7
Grand Total	**49**	**49**	**98**

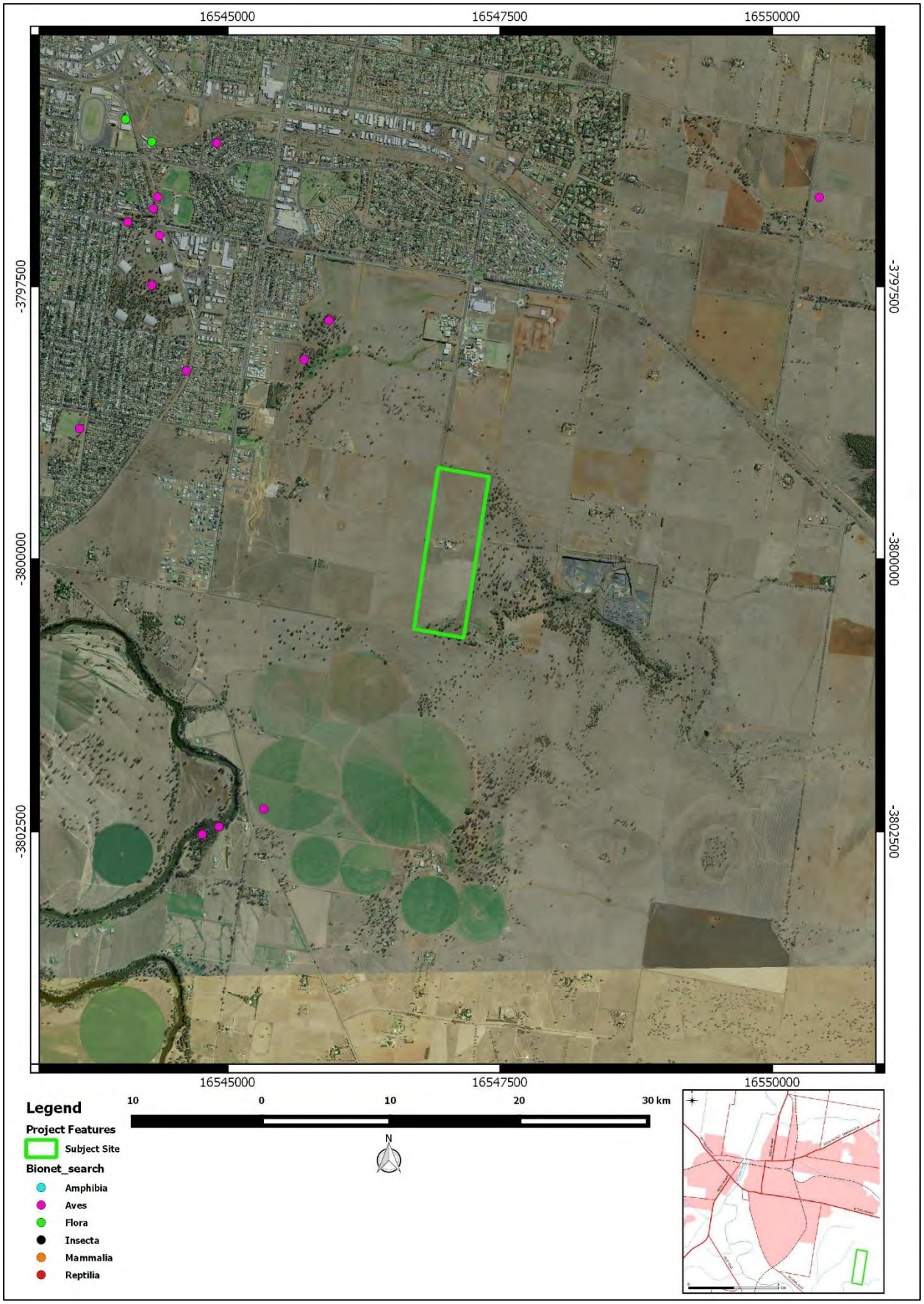
4.1.2 Threatened species and endangered populations within 10 kilometres of the Subject Site

A total of 81 records of 30 threatened species have been previously recorded within a ten kilometre radius of the Subject Site (Bionet: search date 4 January 2017) (**Table 4-2**). As can be seen from **Figure 4-1**, many of these records are around the urban environs of Dubbo.

Table 4-2: Threatened species, extinct and endangered populations within 10 kilometres of the Subject Site.

Species	Number of records
Australian Painted Snipe Rostratula australis	**2**
Barking Owl Ninox connivens	**5**
Bilby Macrotis lagotis	**1**
Black Falcon Falco subniger	**1**
Black-chinned Honeyeater (eastern subspecies) Melithreptus gularis gularis	**1**
Brown Treecreeper (eastern subspecies) Climacteris picumnus victoriae	**1**
Commersonia procumbens	3
Corben's Long-eared Bat Nyctophilus corbeni	**1**
Flame Robin Petroica phoenicea	**1**
Glossy Black-Cockatoo Calyptorhynchus lathami	**2**
Glossy Ibis Plegadis falcinellus	**1**
Grey-crowned Babbler (eastern subspecies) Pomatostomus temporalis temporalis	**16**
Homoranthus darwinioides	1
Koala Phascolarctos cinereus	**1**
Leafless Indigo Indigofera efoliata	**8**
Little Eagle Hieraaetus morphnoides	**4**
Little Lorikeet Glossopsitta pusilla	**2**
Magpie Goose Anseranas semipalmata	**2**
Marsh Sandpiper Tringa stagnatilis	**1**
Mauve Burr-daisy Calotis glandulosa	**2**
Pine Donkey Orchid Diuris tricolor	**3**
Rainbow Bee-eater Merops ornatus	**5**
Red-tailed Tropicbird Phaethon rubricauda	**1**
Regent Honeyeater Anthochaera phrygia	**7**
Ruff Philomachus pugnax	**1**
Sharp-tailed Sandpiper Calidris acuminata	**1**
Speckled Warbler Chthonicola sagittata	**1**
Spotted Harrier Circus assimilis	**3**
Superb Parrot Polytelis swainsonii	**2**
White-fronted Chat Epthianura albifrons	**1**
Grand Total	**81**

Figure 4-1: OEH Bionet records of threatened flora and fauna within 10km of the Subject Site (Data Source: NSW OEH 4 January 2017).



4.1.3 EPBC Protected Matters Report

The DoE Protected Maters report predicts the following protected matters that may or are likely to occur in the Subject Site:

- 14 Listed threatened species
- 10 Migratory species
- 11 Marine species
- Six Commonwealth Lands
- Five EECs

The Regent Honeyeater, Superb Parrot, South-eastern Long-eared Bat, White-throated Needletail and Rufous Fantail are known to occur or have habitat in the Subject Site.

4.1.4 Local context (Biodiversity impact assessments)

Many ecological surveys have taken place in proximity to the Subject Site. The largest and most relevant ecological survey was undertaken by OzArk (2013) as part of the approval process for the Dubbo Zirconium Project. Other relevant surveys include:

- Ecological Assessment: Ecological Assessment: Subdivision Of Lot 399 DP 1199356 and Lot 503 DP1152321, Boundary Road, Dubbo, NSW. (OzArk 2015).
- Tree Assessment: Lot G DP417757, 411 Macquarie Street Dubbo, NSW. Report to Geolyse (OzArk 2014).
- Ecological Assessment: Keswick Stage 5 Residential subdivision (52.5 ha) (OzArk 2013).
- Ecological Assessment: LH Ford Bridge. Report to Dubbo City Council OzArk (2013).
- Biodiversity Assessment for the Dubbo Zirconium Project. Report to Alkane Resources (OzArk 2013).
- Ecological Assessment: Dubbo to Wellington 66kv Powerline Upgrade. Report to Essential Energy. August 2012 (OzArk 2012);
- Ecological Assessment: Proposed recycled water reticulation scheme in three areas within the village of Wongarbon. Report to Dubbo City Council (OzArk 2010).
- Ecological Assessment: Golden Highway/Boothenba Road realignment and intersection improvements. Report to the Roads and Traffic Authority (OzArk 2010)
- *Dubbo Bird List*. Prepared by the Dubbo Field Naturalist Society (Hosking et al. 2010);
- *Status of Vertebrate Fauna And Their Habitat In The Central West Catchment* (Goldney, Kerle and Fleming 2007);
- Ecological Overview of Three Reserves: Jones Creek Reserve, Cumboogle Flora Reserve and Wongarbon Tank Reserve. Dubbo Local Government Area, NSW (OzArk 2009);
- Ecological and Archaeological Assessment: Proposed Wongarbon Sewerage Scheme (WSS) including the Wongarbon Sewerage Treatment Plant (STP) and the associated reticulation scheme within the village of Wongarbon. Report to Dubbo City Council (OzArk (2006).
- Ecological and Archaeological Assessment: 2.4 km Road Rehabilitation and Minor Alignment Shift, c. 16 km Southeast of Dubbo, NSW. Report to Dubbo City Council. (OzArk

2005).

- *Community Data Search And Biodiversity Survey Of The Brigalow Belt South Bioregion Stage 1* (NSW NPWS 2002); and
- *Report On Preliminary Fauna Survey Of The Pilliga And Goonoo Forests*. November 1999 to January 2000 (NSW NPWS 2000).

The research indicates that woodlands dominated by Fuzzy Box (*Eucalyptus conica*) Inland Grey Box (*E. microcarpa*) and White Box (*E. albens*) / Yellow Box (*E. melliodora*) dominate the Dubbo Regional LGA. These woodlands are all listed as Endangered Ecological Communities (EECs) or Threatened Ecological Communities (TECs) under the TSC Act and/or the EPBC Act.

Threatened species such as the Black-chinned Honeyeater, Brown Treecreeper, Diamond Firetail, Grey-crowned Babbler, Speckled Warbler, Little Eagle are commonly recorded in these remnant woodlands in Dubbo. To a lesser extent the Hooded Robin and Varied Sittella are known to occur. Migratory species (EPBC Act) known to occur in the area include the Swift Parrot, Superb Parrot and Rainbow Bee-eater. Although Koalas have been recorded in the locality, they are not a common sighting and it is suggested that riparian areas such as the Macquarie River provide a highway for Koalas to move to more suitable habitat and climatic conditions. The Barking Owl is also known to occur along the Macquarie River. Due to the ease in identifying microbats from echolocation recordings, several species of threatened microbat are also known from the area. These include the Yellow-bellied Sheath-tailed Bat, Greater long-eared Bat, Little Pied Bat and Large-eared Pied Bat.

4.1.5 Predictive model for threatened species detection

As a result of the background searches and literature review, 91 protected matters listed in the schedules of the FM and/and TSC or/and EPBC Act have been previously identified as having habitat present or occurring in the locality.

Of these, 45 protected matters are considered to have potential to occur in the Subject Site (**Table 4-3**). Further details regarding these species can be found in **Appendix 3**.

Table 4-3: Protected matters with potential to occur in the Subject Site

	Common Name	Scientific Name	TSC Act	EPBC Act Status	Potential to occur in Subject Site
1	Ausfeld's Wattle	*Acacia ausfeldii*	V		Potential
2	Barking Owl	*Ninox connivens*	V		Likely
3	Black Falcon	*Falco subniger*	V		Potential
4	Black-breasted Buzzard	*Hamirostra melanosternon*	V		Potential
5	Black-chinned Honeyeater (eastern subspecies)	*Melithreptus gularis gularis*	V		Potential
6	Brown Treecreeper (eastern subspecies)	*Climacteris picumnus victoriae*	V		Likely
7	Cattle Egret	*Ardea ibis*		M	Potential

	Common Name	Scientific Name	TSC Act	EPBC Act Status	Potential to occur in Subject Site
8	Diamond Firetail	*Stagonopleura guttata*	V		Likely
9	Flame Robin	*Petroica phoenicea*	V		Potential
10	Fork-tailed Swift	*Apus pacificus*		M	Potential
11	Fuzzy Box Woodland on alluvial Soils of the South Western Slopes, Darling Riverine Plains and Brigalow Belt South Bioregions	*Fuzzy Box Woodland on alluvial Soils of the South Western Slopes, Darling Riverine Plains and Brigalow Belt South Bioregions*	EEC		Yes
12	Glossy Black-cockatoo	*Calyptorhynchus lathami*	V		Potential
13	Great Egret,			M	Potential
14	Greater Long-eared Bat	*Nyctophilus timoriensis/corbeni (South-eastern form)*	V	E	Potential
15	Grey Falcon	*Falco hypoleucos*	E		Potential
16	Grey-crowned Babbler (eastern subspecies)	*Pomatostomus temporalis temporalis*	V		Yes
17	Homoranthus darwinioides	*Homoranthus darwinioides*	V	V	Potential
18	Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions/Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of		EEC	E	Yes
19	Koala	*Phascolarctos cinereus*	V		Potential
20	Little Eagle	*Hieraaetus morphnoides*	V		Potential
21	Little Lorikeet	*Glossopsitta pusilla*	V		Potential
22	Little Pied Bat	*Chalinolobus picatus*	V		Potential
23	Major Mitchell's Cockatoo	*Lophochroa leadbeateri*	V		Potential
24	Masked Owl	*Tyto novaehollandiae*	V		Potential
25	Painted Honeyeater	*Grantiella picta*	V		Potential
26	Pine Donkey Orchid	*Diuris tricolor*	V		Likely
27	Rainbow Bee-eater	*Merops ornatus*		M	Potential
28	Regent Honeyeater	*Anthochaera phrygia*	CE	E	Likely
29	Rufous Fantail			M	Potential
30	Satin Flycatcher			M	Potential
31	Scant Pomaderris	*Pomaderris queenslandica*	E		Potential
32	Scarlet Robin	*Petroica boodang*	V		Potential
33	Speckled Warbler	*Pyrrholaemus saggitatus*	V		Yes
34	Spotted Harrier	*Circus assimilis*	V		Potential
35	Spotted-tailed Quoll	*Dasyurus maculatus*	V	E	Potential
36	Square-tailed Kite	*Lophoictinia isura*	V		Potential
37	Superb Parrot	*Polytelis swainsonii*	V	V	Likely
38	Swift Parrot	*Lathamus discolor*	E	E	Potential
39	Turquoise Parrot	*Neophema pulchella*	V		Potential
40	Varied Sittella	*Daphoenositta chrysoptera*	V		Likely
41	White Box-Yellow Box-Blakely's Red Gum Grassy		EEC	CE TEC	Yes
42	White-throated Needletail	*Hirundapus caudacutus*		Listed	Potential
43	Yellow-bellied Sheathtail-bat	*Saccolaimus flaviventris*	V		Potential

	Common Name	Scientific Name	TSC Act	EPBC Act Status	Potential to occur in Subject Site
44		*Tylophora linearis*	V	E	Potential
45	Aquatic Ecological Community in the Natural Drainage System of the Lowland Catchment of the Darling River EEC (NSW FM Act).		EEC (TSC Act)		Yes

E- Endangered. **V- Vulnerable**
EP- Endangered Population. **M- Migratory or Marine (EPBC Act)**
EEC- Endangered Ecological Community. **CE- Critically Endangered**
CEEC- Critically Endangered Ecological Community **TEC – Threatened Ecological Community**

4.2 FIELD SURVEY RESULTS

4.2.1 Vegetation communities and habitat

The Subject Site is almost completely cleared, ploughed and disturbed with a few isolated trees.

Section 3.4 describes OEH (VIS Map 3458) maps remnant vegetation in the southern end of the Subject Site correctly but the grassland mapped in the northern part of the Subject Site has not been mapped correctly.

Approximately 4.5ha of PCT ID:81 Western Grey Box - cypress pine shrub grass shrub tall woodland in the Brigalow Belt South Bioregion (**Figures 3-1, 3-2 and Table 3-1**) occurs in the Subject Site along Eulomogo Creek, mostly on its southern side. The term 'approximately' does not indicate a lack of mapping skill by the consultant, it indicates the lower stratum is weedy and there is no hard line of division between 'a weedy paddock with a few native trees' (not a native vegetation community) and a 'native woodland community remnant with a weedy understory' (a native vegetation community).

Threatened and endangered ecological communities

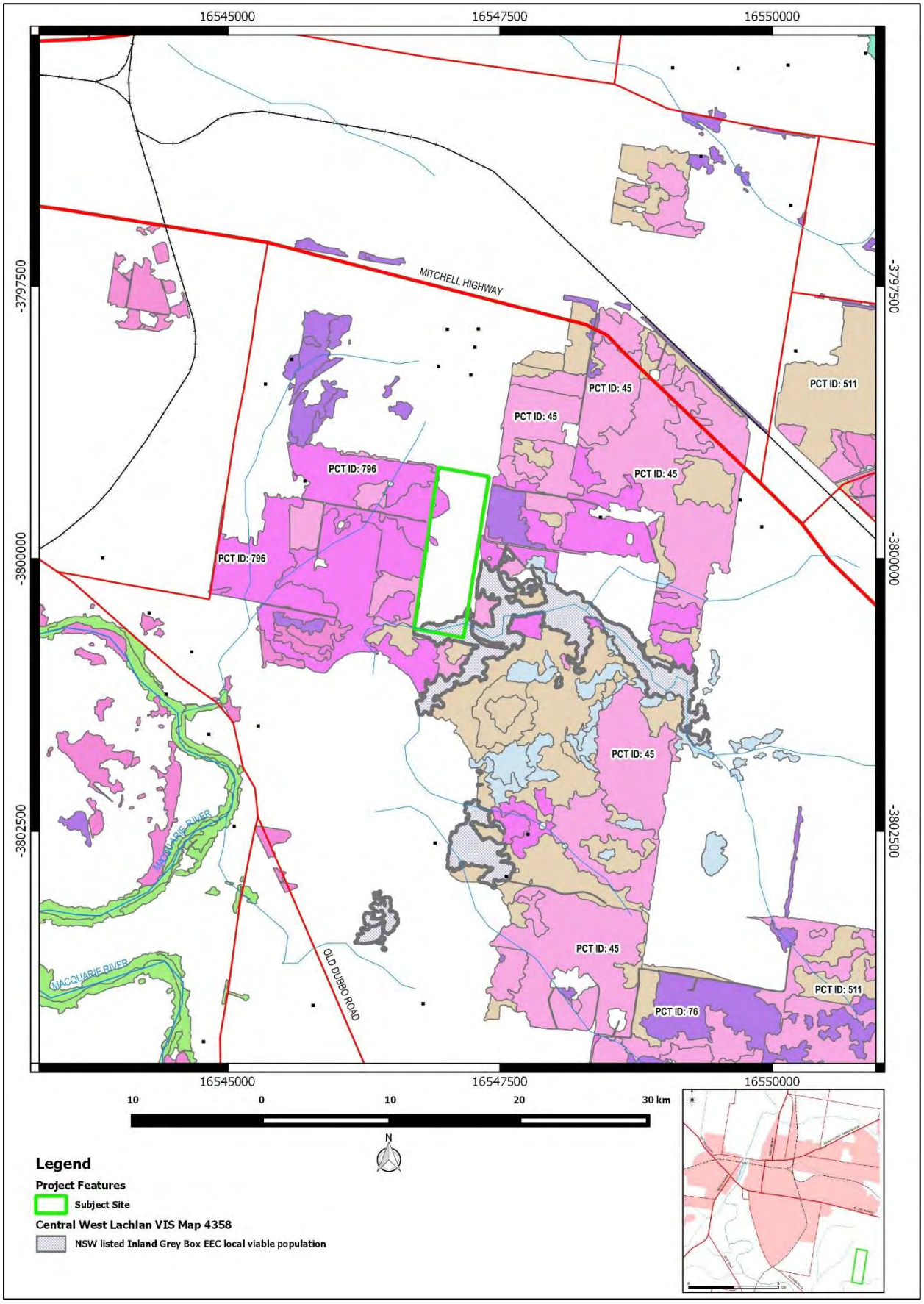
PCT ID:81 Western Grey Box - cypress pine shrub grass shrub tall woodland in the Brigalow Belt South Bioregion is an endangered ecological community listed in the NSW TSC Act (*Inland Grey Box Woodland*). This EEC total patch size (i.e. the same vegetation community that extends onto surrounding property) is 77.7 ha (determined by VIS map 4358) in the Subject Site is 5.9 percent of the local viable population of the EEC.

The Commonwealth listed EEC with a similar name does not occur in the Subject Site as it's too weedy to meet the minimum quality criterion.

Eulomogo Creek forms part of the FM Act listing for the '*aquatic ecological community in the natural drainage system of the lowland catchment of the Darling River.'* The creek is in poor condition however provides connectivity to the Macquarie River.

An Assessment of Significance has been completed for each to characterise the potential impacts.

Figure 4-2: Viable local population of the NSW Inland Grey Box Woodland EEC



4.2.2 Flora species

Seventy-two (72) species of vascular flora was recorded during the assessment (**Table 4-4** and **4-5**). All plots recorded a high incidence of non-native plant species, indicative of the disturbed nature of the ground surface. Overall there were 31 species of native plants and 41 species of weeds, not including the five species of native trees recorded, the ground stratum was 36% native (or 64% weedy).

Table 4-4: Summary of native species recorded by plot.

Plot number		*1*	*2*	*3*
TOTAL species / plot		61	27	27
Total species	72			
Native Plant Species	31	28	8	7
Non-native sp.	41	33	31	21
% Native Plant Species	43	38	11	11
% non-native	57	62	89	89

Table 4-5: Summary of stratum details by plot.

STRATUM DETAILS	PLOT 1	PLOT 2	PLOT 3
Native canopy cover - upper stratum (%)	25	0	0
Native Mid stratum	0	1	0
Native Lower stratum (not grass) (%)	3	6	6
Native Lower stratum (grasses) (%)	12	7	6
(%) of exotic grasses	85	90	95

Threatened and endangered flora

No species of listed threatened flora were recorded or considered likely to occur in the Subject Site.

Exotic and noxious flora

One species of Class 4 'Locally Controlled Weed' declared in the Local Control Authority area of Dubbo Regional Council was recorded in the Subject Site. This was isolated and very infrequent African Boxthorn (*Lycium ferocissimum*) plants. See **Appendix 2** for complete DRC Noxious weed listings. This species is also listed as a Weeds of National Significance (WoNs). Management of this weed requires coordination among all levels of government, organisations and individuals with weed management responsibilities.

4.2.3 Fauna species

Twenty-three (23) species of fauna recorded during the assessment. This included two reptile and frogs and 19 birds.

Threatened species

No species of threatened fauna were recorded in the Subject Site. The lack of diverse, quality habitat in the Subject Site reduces the potential of many threatened species known for the locality having habitat present in the Subject Site or occurring. However, due to known survey limitations (**Section 2.6**), some threatened species are considered likely to occur or have habitat in the Subject Site based on available habitat and previous records. These are listed in **Section 4.3**.

The targeted survey for the Pink-tailed work lizard did not reveal any individuals or suitable habitat. As the Subject Site does not contain a trachite deposit (known Pink-tailed Worm Lizard habitat in the locality) geologically it is not considered to be prime habitat.

Endangered populations

No endangered fauna populations considered likely to occur within the Subject Site.

4.2.4 Fauna habitat

General fauna habitat

Fauna habitat in the Subject Site is restricted to derived grassland with the odd isolated eucalypt. Open/disturbed areas favours common generalist species which are capable of utilising open ground for foraging and common disturbance-tolerant species which are ubiquitous in modified habitats.

Isolated trees within the cleared/disturbed areas are known to contribute to the viability of wildlife populations in agricultural mosaic landscapes by maintaining connectivity between larger patches of remnant vegetation (Gibbons *et*. *al*. 2008).

Koala habitat

State Environmental Planning Policy (SEPP) 44 does not apply to the Dubbo Regional LGA. Potential Koala habitat still requires management under the EPBC Act. The Approved Recovery Plan for the Koala (DECC 2008) provides lists of koala food trees categorised as primary, secondary and supplementary within Koala Management Areas (KMAs). Primary food trees exhibit a level of use that is significantly higher than that of other Eucalyptus species and is independent of tree density. The Dubbo Regional LGA is within KMA 6: Western Slopes. Large populations of koalas occur on the western slopes and plains, in particular the Pilliga region (Kavanagh and Barrott 2001) and in Gunnedah (Smith 1992) and Walgett LGAs (J. Callaghan, Australian Koala Foundation, pers. comm.). In the south of this KMA, a population of koalas occurs along the Murrumbidgee River at Narrandera. River Red Gum is listed as primary food source, Yellow Box and White Box are listed as a secondary food source and Red Stringybark is listed as a supplementary food source.

The Subject Site is considered "potential koala habitat". Koalas are known to be a transient species in the locality, specifically along the Macquarie River. The lack of records in the Subject

Site is not considered to represent the absence of koalas, rather that habitat away from the riverine environment is not considered to be core koala habitat. As such, the Subject Site is considered 'potential' Koala habitat (as Koalas will move through cleared paddocks to access suitable habitat) as no resident population or breeding females are considered to occur in the Subject Site.

Critical habitat

There are four declared critical habitats in NSW and three recommendations for critical habitat status in NSW.

Five Commonwealth critical habitats are listed in the EPBC Act.

None of these identified areas of critical habitat are located within the boundaries of the Subject Site.

Aquatic habitat

Aquatic habitat in the Subject Site is poor with a high nutrient loading (**Table 4-5**). Although some aquatic habitat such as grasses, rushes and sedges are present and provide refuge for a variety of species, cattle has impacted the quality and suitability of this habitat. Eulomogo Creek and various dams in the Subject Site provide suitable foraging areas and habitat for water birds, waders and migratory birds as well as habitat for aquatic species such as frogs, turtles and fish. The creek is in poor condition and is unlikely to provide habitat for threatened fish species.

Although emergent aquatic vegetation increases the possibility that threatened birds would breed in this area, the lack of terrestrial vegetation cover and impacts by cattle reduce this potential. Furthermore, the majority of migratory waders do not breed in Australia.

Table 4-6: Summary of water condition and aquatic habitat in Eulomogo Creek.

Nutrient Loading		**Eulomogo Creek**
Filamentous algae		**Yes**
Water weeds (Azola / Salvinia)		**Yes**
Weeds on banks		**Yes**
Cumbungi, reeds, bullrush		**Yes**
Native tree death		No
Bad smells from the water		**Yes**
Surface scum		**Yes**
Stock refusing to drink		No
		High (7/9)
Macro-invertebrate pollution tolerance data		
Rating of water	**Sensitivity**	**Present**
	very sensitive organisms	
	stonefly nymphs	
4 = Excellent	mayfly nymphs	
	freshwater shrimp	

	freshwater crayfish	x
	sensitive organisms	
	dobonsonflys (alderflies)	
	mussels	
	freshwater prawns	
3 or > = Good	freshwater crayfish	x
	dragonfly nymphs	
	damselfly nymphs	
	caddisfly nymphs	
	water mites	
	tolerant organisms	
	beetle (Coleoptera)	x
	true bugs (Hemiptera)	
2 or > = Fair	leech	
	freshwater snail	
	flatworm	
	very tolerant organisms	
	black fly larvae	x
	mosquito larvae	x
1 or > = Poor	fly larvae	x
	non-biting midges (including bloodworms)	x
	freshwater worms	
Overall rating		**Poor**
Habitat Features		
	Habitat Type	Permanent water
	Pool Size	4m wide, 200m long
	Bank Slope	40 to 90 degrees
	Depth (Max Av)	0.5m
	Substrate type	sand and basalt rock
	Downstream connectivity	good / continuous
	Waterway Condition	Poor
	Contributions to cover	NIL
	Submerged physical	NIL
	Submerged biological	NIL
	Emergent reeds / plants	Bull rush, water ribbons (all impacted by cattle)
	Canopy % over water (50m)	20%
	General terrestrial veg cover	Derived Grassland (formerly Fuzzy Box Woodland)
	Temperature (10cm)	21 degrees Celsius

4.2.5 Protected Matters - Migratory and marine species

Background searches revealed the potential presence of several migratory species in the locality. The Fork-tailed Swift and White-throated Needletail are almost exclusively aerial (including foraging) and as such can be recorded over many habitats. The Rainbow Bee-eater is known to have breeding habitat in sandy areas near the Macquarie River in Dubbo and has potential to

occur in the Subject Site. Likewise the Satin Flycatcher, Rufous Fantail (seasonal migrants) are likely to occur and forage in riverine environments including Eulomogo Creek. However, a lack of perching opportunities decreases the likelihood that these species would be recorded in the Subject Site. The Superb Parrot, Regent Honeyeater and Swift Parrot are unlikely to have foraging resources in the Subject Site during the non-breeding period due to a lack of flowering resources. Furthermore a lack of flowering species in the Subject Site, deplete the potential for most winter migrants to occur in the Subject Site.

4.2.6 Key Threatening Processes

Key threatening processes are processes that, in the opinion of the relevant Scientific Committee, adversely affect threatened species populations or ecological communities, or could cause species, populations or ecological communities that are not threatened to become threatened

Of the 36 Key Threatening Processes (KTP) listed in the schedules of the TSC Act, five are currently operating in the Subject Site. These include:

- Competition and grazing by the feral European rabbit (*Oryctolagus cuniculus*).
- Predation by the European red fox (*Vulpes vulpes*).
- Predation by the feral cat (*Felis catus*).
- Removal of dead wood and dead trees.
- Removal of hollow bearing trees.

Of the 20 Key Threatening Processes (KTP) listed in the schedules of the EPBC Act, eight are currently operating in the Subject Site. These include:

- Competition and land degradation by rabbits.
- Land clearance.
- Loss and degradation of native plant and animal habitat by invasion of escaped garden plants, including aquatic plants.
- Loss of climatic habitat caused by anthropogenic emissions of greenhouse gases.
- Novel biota and their impact on biodiversity.
- Predation by European red fox.
- Predation by feral cats.
- Psittacine Circoviral (beak and feather) Disease affecting endangered psittacine species.

4.3 SUMMARY

On the basis of regional records, reports and the presence of suitable habitat, 15 threatened items listed in the schedules of the TSC Act and / or EPBC Act were assessed as likely to occur or have habitat in the Subject Site and be affected by the Proposal (**Table 4-7**). Assessments of significance were conducted for these species (**Appendix 5**).

Table 4-7: Threatened species known to occur or have potential occur in the Subject Site.

	Common Name	Scientific Name	TSC Act	EPBC Act	Potential to occur in Subject Site	Significance Assessment
1	Barking Owl	*Ninox connivens*	V		Likely hunting grounds	7-Part Test (TSC Act)
2	Black Falcon	*Falco subniger*	V		Potential hunting grounds	7-Part Test (TSC Act)
3	Cattle Egret	*Ardea ibis*		M	Potential to occur	Assessment of Significance (EPBC Act)
4	Fork-tailed Swift	*Apus pacificus*		M	Potential foraging area	Assessment of Significance (EPBC Act)
5	Fuzzy Box Woodland on alluvial Soils of the South Western Slopes, Darling Riverine Plains and Brigalow Belt South Bioregions		EEC		Precautionary Principle	7-Part Test (TSC Act)
6	Great Egret			M	Potential	Assessment of Significance (EPBC Act)
7	Grey Falcon	*Falco hypoleucos*	E		Potential hunting grounds	7-Part Test (TSC Act)
8	Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions		EEC	TEC	Precautionary Principle	7-Part Test (TSC Act)
9	Little Eagle	*Hieraaetus morphnoides*	V		Potential hunting grounds	7-Part Test (TSC Act)
10	Rainbow Bee-eater	*Merops ornatus*		M	Potential breeding habitat and foraging habitat	Assessment of Significance (EPBC Act)
11	Spotted Harrier	*Circus assimilis*	V		Potential hunting grounds	7-Part Test (TSC Act)
12	Square-tailed Kite	*Lophoictinia isura*	V		Potential hunting grounds	7-Part Test (TSC Act)
13	White Box-Yellow Box-Blakely's Red Gum Grassy		EEC	CE TEC	Precautionary Principle	7-Part Test (TSC Act)
14	White-throated Needletail	*Hirundapus caudacutus*		M	Potential foraging area	Assessment of Significance (EPBC Act)
15	Aquatic Ecological Community in the Natural Drainage System of the Lowland Catchment of the Darling River EEC (NSW FM Act).		EEC		Eulomogo Creek forms part of the listing for this EEC.	7-Part Test (TSC Act)

E - Endangered. **V- Vulnerable**
EEC - Endangered Ecological Community. **CE- Critically Endangered**
CEEC- Critically Endangered Ecological Community **TEC – Threatened Ecological Community**
M- Migratory or Marine (EPBC Act)

5 IMPACTS

5.1 TERRESTRIAL FLORA AND ECOLOGICAL COMMUNITIES

It is anticipated that 45 hectares will be directly affected by the activity in the Subject Site. The vegetation identified as Inland Grey Box EEC at the southern end of the lot will not be impacted.

5.2 TERRESTRIAL FAUNA AND FAUNA HABITATS

It is unlikely that fauna species would be directly impacted in the Subject Site as a result of the Proposal. Fauna may be impacted by:

- Vegetation removal for the establishment of the residential infrastructure.
- Disturbance associated with machinery (noise, dust vibration).
- Collisions with vehicles.
- Impact to grassy habitat.

The potential loss of cleared and disturbed habitat represents an insignificant loss of habitat for native fauna.

Hollow dependent fauna would not be impacted as no hollow bearing trees will be removed.

Assessments of Significance for those threatened species considered likely to be affected by the Proposal (**Section 6**) determined that the Proposal would have no significant impact. Suitable high quality habitat for threatened species will exist adjacent to the Subject Site and will remain undisturbed.

5.2.1 Wildlife Corridors and Connectivity

Impact to already cleared and disturbed tussock grasslands will not fragment an existing remnant nor affect a wildlife corridor.

5.2.2 Critical habitat

No areas defined as critical habitat in NSW or in the Commonwealth will be affected by the activity.

5.3 KEY THREATENING PROCESSES

A number of Key Threatening Processes (KTP) listed on the schedules of the TSC Act may be exacerbated by the Proposal. These KTP's include:

- Anthropogenic climate change (TSC Act)
- Clearing of native vegetation (TSC Act);
- Invasion of native plant communities by exotic perennial grasses (TSC Act).

- Land clearance (EPBC Act).

The clearing of native vegetation is a major contributor to the loss of biodiversity. In the determination, the NSW Scientific Committee found that 'clearing of any area of native vegetation, including areas less than two hectares in extent, may have significant impacts on biological diversity'.

5.4 INVASIVE SPECIES

Ground disturbing activities may:

- Increase weed invasion. The spread of noxious weeds may occur during construction within the Subject Site given the weedy environments within the larger area.
- Increase opportunities for feral animals. The proposed works may improve habitat conditions for pests that thrive on disturbed and cleared environments. There is some potential for construction workers to leave food scraps and debris that may encourage these animals. It is unlikely that local populations would increase as a result of the activity.
- Introduce pests and pathogens. No known plant pathogens are likely to be introduced into the area during construction work.

5.5 NOISE/VIBRATION

Construction associated with the subdivision is unlikely to affect any native fauna given the disturbed cleared nature of the Subject Site. Within semi-urban areas, noise and vibration is unlikely to increase above background traffic noise.

While impacts are likely, it is anticipated that any sensitive mobile fauna utilising the area would be able to migrate to surrounding areas of similar habitat such as riparian habitat (Macquarie River) or nearby reserves and conservation networks for the duration of the works.

5.6 TRAFFIC IMPACTS

Light and heavy vehicle movements within the Subject Site would be required during the construction of the subdivision infrastructure. The majority of fauna are mobile and will have a chance to disperse to adjacent riparian habitat.

5.7 DUST/EROSION

Construction activities would increase dust levels. However revegetation activities associated with improving the condition of Eulomogo Creek would improve dust and erosion on site.

5.8 MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE

The EPBC Act provides a mechanism for assessing the environmental impact of activities and developments, where 'Matters of National Environmental Significance' (MNES) may be affected by the proposed activities. Impacts to Matters of National Environmental Significance are listed in **Table 5–1**.

Table 5-1: Matters of National Environmental Significance.

Matter of NES	Impact
Any environmental impact on a World Heritage property	No
Any impacts on wetlands of international importance	No. The proposal would not impact on any water quality or flows of the area. Due to the distance from wetland areas it is considered that the works would have no significant impacts.
Any environmental impact on Commonwealth listed threatened species or ecological communities	**Threatened Ecological Communities (TECs) -** No Commonwealth listed TECs are within the Subject Site. **Fauna** – The majority of fauna species are mobile species and in most instances are capable of migrating away from the proposed Subject Site. Noise and vibration associated with the proposal is likely to disturb birds or terrestrial fauna briefly, however none of the migratory species potentially occurring in the locality is likely to have 'important habitat' in the Subject Site. **Flora** - No listed commonwealth flora was considered likely to occur in the Subject Site.
Any environmental impact on Commonwealth listed migratory species	Migratory birds are mobile species and in most instances are capable of migrating away from the proposed Subject Site. The Subject Site represents potential, yet unlikely habitat for many of the identified migratory species.
Does the project affect any national heritage places	No
Does any part of the proposal involve a nuclear action?	No
Any environmental impact on Commonwealth marine area?	No
Any direct or indirect effect on Commonwealth land?	No

6 SIGNIFICANCE ASSESSMENTS

The appropriate management of ecological items is usually determined on the basis of their assessed significance as well as the likely impacts of any Proposal. Significance of a species, population or community is determined by appointed NSW and National Scientific Committees. Cultural and public significance are considerations within the significance determination process. Within the framework of an impact assessment, impacts to listed significant item must be assessed at a State (under the TSC Act) or National (under the EPBC Act) level – even if it is the same species. The following sections identify State or nationally listed threatened (significant) species then determines if impacts are 'significant'.

Significant can be defined as: there is a real chance/greater than 50 per cent chance, that the action (direct or indirect) will cause a viable local population to go extinct.

6.1 AFFECTED SPECIES

It should be noted that in the *Threatened species assessment guidelines: The assessment of significance* (DECC 2007), a species does not have to be considered as part of the assessment of significance if adequate surveys or studies have been carried out that clearly show that the species, population or community:

- does not occur in the Subject Site, or
- will not use on-site habitats on occasion, or
- Will not be influenced by off-site impacts of the proposal.

Otherwise all species likely to occur in the Subject Site (based on general species distribution information) and known to use that type of habitat, would be considered in the rationale that determines the list of threatened species, populations and ecological communities for the assessment of significance.

6.2 SIGNIFICANT COMMUNITIES, POPULATIONS OR SPECIES WITHIN THE SUBJECT SITE

There are 11 fauna species and four[1] EECs identified as being affected by the Proposal (**Table 4-7)**. Consideration of the type and scale of habitat to be removed has resulted in the conclusion that no threatened species would be significantly affected by the Proposal (**Table 6–1**). The preparation of a Species Impact Statement will not be required for the Project.

Appendix 5 provides detailed assessment of affected species and full version of seven-part tests and assessments of significance.

[1] Only one EEC (Inland Grey Box) has been mapped in the Subject Site but technically components of Box Gum and Fuzzy BoxEECs are also present.

Table 6-1: Summary of the assessment of significance and seven-part tests

TSC Act significance assessments								
Threatened species, or communities	7-Part Test Questions							Likely significant impact?
	a	b	c	d	e	f	g	
Barking Owl	N	X	N	Y	X	Y	Y	**No**
Black Falcon	N	X	N	Y	X	Y	Y	**No**
Little Eagle	N	X	N	Y	X	Y	Y	**No**
Grey Falcon	N	X	N	Y	X	Y	Y	**No**
Spotted Harrier	N	X	N	Y	X	Y	Y	**No**
Square-tailed Kite	N	X	N	Y	X	Y	Y	**No**
White Box-Yellow Box-Blakely's Red Gum Grassy	X	X	Y	Y	X	Y	Y	**No**
Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions	X	X	Y	Y	X	Y	Y	**No**
Fuzzy Box Woodland on alluvial Soils of the South Western Slopes, Darling Riverine Plains and Brigalow Belt South Bioregions	X	X	Y	Y	X	Y	Y	**No**
Aquatic Ecological Community in the Natural Drainage System of the Lowland Catchment of the Darling River EEC (NSW FM Act).	X	X	Y	Y	X	Y	Y	**No**

EPBC Act Assessments[2,3,4,5]		
Threatened species, or communities	**Important population**	**Likely significant impact?**
White-throated Needletail	No	No
Rainbow Bee-eater	No	No
Cattle Egret	No	No
Fork-tailed Swift	No	No
Great Egret	No	No

Notes: Y= Yes (negative impact), N= No (no or positive impact), X= not applicable, ?= unknown impact.

1. Significance Assessment Questions as set out in the *Threatened Species Conservation Act 1995/ Environmental Planning and Assessment Act 1979.*
   - **a** in the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,
   - **b** in the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction,
   - **c** in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:
     - (i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or
     - (ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,
   - **d** in relation to the habitat of a threatened species, population or ecological community:
     - (i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and
     - (ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and
     - (iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality,
   - **e** whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),
   - **f** whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,
   - **g** whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.
2. Refer to DEWHA 2013 for significant impact criteria.
3. Important Population as determined by the *Environment Protection and Biodiversity Conservation Act 1999*, is one that for a vulnerable species:
   - **a** is likely to be key source populations either for breeding or dispersal
   - **b** is likely to be necessary for maintaining genetic diversity
   - **c** is at or near the limit of the species range.
4. A 'population of a species' is defined under the EPBC Act as an occurrence of the species in a particular area. In relation to

critically endangered, endangered or vulnerable threatened species, occurrences include but are not limited to:

a • a geographically distinct regional population, or collection of local populations, or

b • a population, or collection of local populations, that occurs within a particular bioregion.

5. Population' as defined under the EPBC Act, in relation to migratory species, means the entire population or any geographically separate part of the population of any species or lower taxon of wild animals, a significant proportion of whose members cyclically and predictably cross one or more national jurisdictional boundaries including Australia.

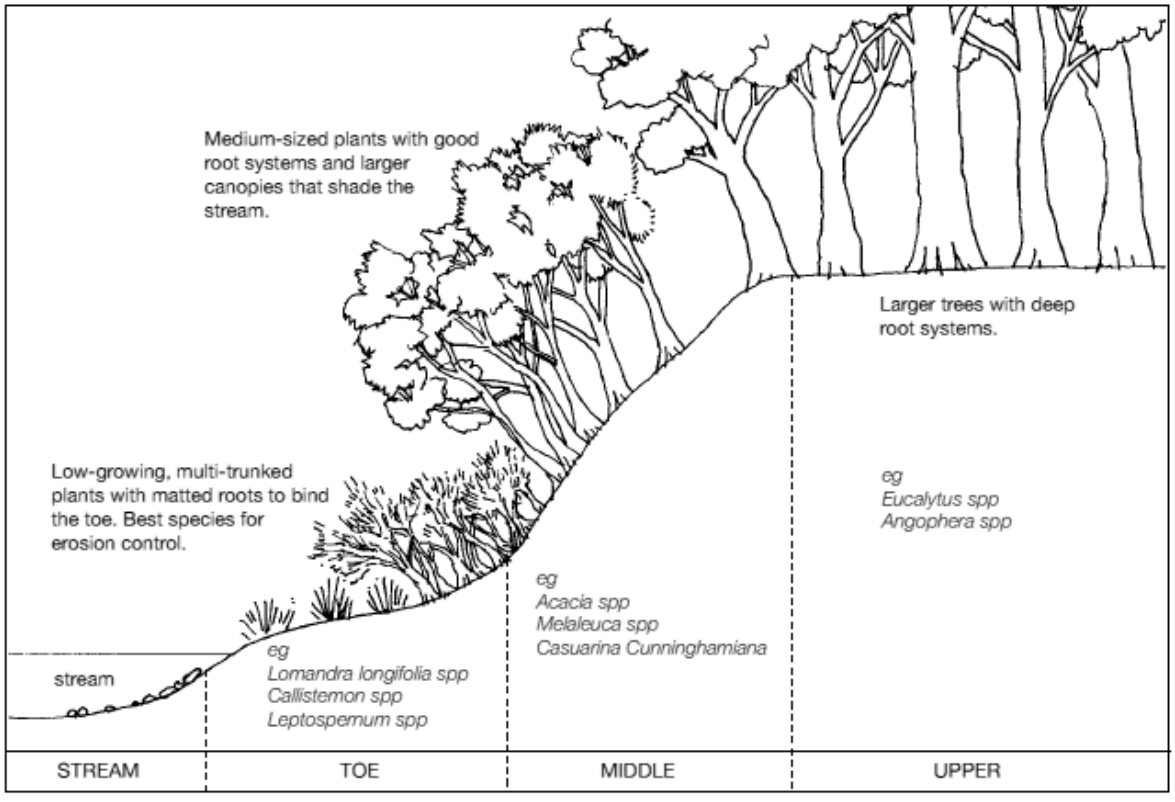
7 RECOMMENDATIONS

The following mitigation measures have been made in regards to the Proposal.

1. Areas to be cleared in the Subject Site should be clearly marked with high visibility nightline to ensure that approved boundary clearing creep does not occur.
2. Any change in design outside the assessed impact footprint within the Subject Site will require further ecological survey.
3. All food scraps and rubbish are to be appropriately disposed of in sealed receptacles to prevent foraging habitats for foxes, rats, dogs and cats.
4. An Erosion and Sediment Control Plan (ESCP), shall be prepared for the works and would be in line with Landcom's Managing Urban Stormwater, Soils & Construction Guidelines (The Blue Book) (Landcom 2004).
    - Erosion and sedimentation control measures would be installed around Eulomogo Creek and not be removed until disturbed areas have stabilised.
    - Maintenance and checking of the erosion and sedimentation controls would be undertaken on a regular basis and records kept and provided at any time upon request.
    - Sediment would be cleared from behind barriers on a regular basis and all controls would be managed in order to work effectively at all times.
5. Best practice weed management should be in place to prevent the transfer of weed seeds and vegetative materials, including the washdown of vehicles entering or leaving the worksite.
6. Ongoing weed control should be undertaken in the Subject Site.
    - As per the Noxious Weeds Act, Class 4 Noxious Weeds must be managed in a manner that continuously inhibits the ability of the plant to spread and the plant must not be sold, propagated or knowingly distributed.
    - Ensure all seed and seed head is collected and disposed of.
7. Stockpiles in the Project Site in their present state are likely to provide refuge for invasive species and should be refined and reduced.
8. Under the NV Act, a permit from the Central West Local Land Services is required to clear within 40 metres of Eulomogo Creek. The current project will not impact within 40 metres of this waterway. Should the project need to impact within 40 metres of this waterway (even for rehabilitation / revegetation) then further advice from this department should be sought.

9. Under the FM Act, a permit from DPI is required for any rehabilitation, reclamation or dredging work within the banks of the Eulomogo Creek. Should the project need to impact within 40 metres of this waterway (even for rehabilitation / revegetation) then further advice from this department should be sought.
10. Under the 'integrated development' provisions of the NSW EPA Act, MAAS may require approval from DPI for a permit to temporarily or permanently block fish passage (if Eulomogo Creek is to be blocked). The current proposal does not require the creek to be blocked.
11. Under the WM Act, MAAS will require a controlled activity approval for the Proposal if works are to occur within 40 metres of Eulomogo Creek. Should the project need to impact within 40 metres of this waterway (even for rehabilitation / revegetation) then further advice from this department should be sought.
12. Rehabilitation and revegetation efforts should be directed at restoring the Eulomogo Creek riparian zone. This would include maintaining a 40 metre buffer (at least) from the edge of the banks. Connectivity within this riparian zone to the existing Keswick Estate Green Corridor (Macquarie River to Orana Mall) is recommended. **Figure 7-1** provides guidance for rehabilitation along the creek and additional information had been provided below for species selection.

Figure 7-1: Proposed cross section showing revegetation of the creek.



Adapted from *Rivercare: Guidelines for Ecological Sustainable Management of Rivers and Riparian Vegetation:* Raine, A.W & Gardiner, J.N, (1995), LWRRDC, Canberra.

- The proposed species list for areas requiring planting is:
    - Upper stratum (on the Upper Creek Bank, see **Figure 7-1**)
        - White Box (Eucalyptus albens) / Yellow Box (Eucalyptus melliodora) / Fuzzy Box (Eucalyptus conica) at 30 metre spacing.
        - Inland Grey Box (Eucalyptus microcarpa) at 50 metre spacing
        - Mid stratum - (on the Middle Creek Bank, see **Figure 7-1**)
            - Acacia hakeoides, Acacia pycnantha, Acacia decora, Dodonaea viscosa subsp. cuneata, Western Boobialla (Myoporum montanum), Pittosporum angustifolium, Silver Cassia (Senna form taxon 'artemisioides') at 30 metre spacing.
    - Lower stratum (on the Toe Creek Bank, see **Figure 7-1**)
        - Grasses - Austrostipa bigeniculata, Austrodanthonia caespitosa, Kangaroo Grass (Themeda australis), Redleg Grass (Bothriochloa macra), Chloris truncata, Austrostipa scabra, Dichanthium sericeum, Enteropogon acicularis, Panicum effusum.
            - The grass species can be commercially purchased, the remaining species are likely to recover unassisted. The recommended sowing rate is 0.25kg / hectare and the seed supplier will provide instructions on how to prepare the area.
        - Other - Dichopogon strictus, Hydrocotyle laxiflora, Podolepis jaceoides, Vittadinia cuneata, Wahlenbergia luteola, Atriplex semibaccata, Lomandra filiformis subsp. coriacea.
    - Lower stratum (in the Creek bed and walls, see **Figure 7-1**)
            - Lomandra filiformis subsp. coriacea, Lomandara longifolia, Carex appressa, Cypress excellatus, Phragmities australis and Juncus spp. The recommended planting rate is one plant per metre square of the final creek bed area of extent and walls of ponds.

8 CONCLUSION

Having given consideration to the ecology within the Subject Site, it is apparent that the Proposal is:

- unlikely to significantly affect any of the listed threatened species, fauna populations or communities.
- unlikely to augment or significantly contribute to any of the National or State listed Key Threatening Processes, if the appropriate safeguards regarding the control of potential vertebrate pests are effectively applied.
- unlikely to significantly affect any Ramsar wetland or any CAMBA or JAMBA listed species.
- unlikely to significantly affect local hydrology.
- consistent with ESD principles with regard to fauna, would not adversely affect the local biodiversity and no issue of inter-generational or value added matters are relevant in this instance.

The proposed activity should not be considered to constitute a significant impact and, as such, no Species Impact Statement (SIS) is warranted. No Koala Habitat Management Plan pursuant to SEPP 44 should be required.

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10 PLATES

	Plate 1: *Biometric* plot 1.
	Plate 2: *Biometric* plot 2.
	Plate 3: *Biometric* plot 3.

APPENDIX 1: TERMS AND ABBREVIATIONS

Terminology	Abbreviation	Description
Activity		Has the same meaning as in the EP&A Act, ie the nature of the proposed activity is described in **Section 1.1**. The EP&A Act definition refers to physical 'activity' in relation to land that is specified by a regulation to be a work for the purposes of the Act
Australian Bureau of Meteorology	BOM	
Australian Height Datum	AHD	
Catchment Management Authority	CMA	Thirteen CMAs have been established, the specific functions of CMAs are described in the *Catchment Management Authorities Act 2003*. The CMAs are responsible for managing natural resources at the catchment scale. Key roles include preparing Catchment Action Plans (CAPs) and managing incentive programs to implement the plans. CMA's have now been superseded by Local Land Services (LLS), however the boundaries still apply for ecological database searches.
Core Koala Habitat		State Environmental Planning Policy (SEPP) 44: core koala habitat means an area of land with a resident population of koalas, evidenced by attributes such as breeding females (that is, females with young) and recent sightings of and historical records of a population.
Dubbo Regional Council	Council	
Ecologically Sustainable Development.	ESD	The EPBC Act sets out the principles of ecologically sustainable development which apply to certain decisions made under the Act. These principles are: • The need to integrate economic, environmental, social and equitable considerations. • The precautionary principle. • The principle of inter-generational equity. • The conservation of biological diversity. and • Improved valuation, pricing and incentive mechanisms.
Endangered Ecological Community	EEC	An ecological community specified in Part 3 of Schedule 1 of the TSC Act or within the schedules of the EPBC Act.
Endangered population		Population specified in Part 2 of Schedule 1 of the TSC Act.
Environmental Impact Statement	EIS	Describes the positive and negative environmental effects of a proposed action and provides potential management measures to ameliorate these impacts.
Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth).	EPBC Act	Provides for the protection of the environment, especially matters of national environmental significance, and provides a national assessment and approvals process.
Environmental Planning and Assessment Act 1979 (NSW).	EP&A Act	Provides the legislative framework for land use planning and development assessment in NSW.

Terminology	Abbreviation	Description
Fisheries Management Act 1994 (NSW).	FM Act	Administered by the Minister for Primary Industries, except Part 7 (Division 2), which is administered jointly by the Minister for Minister for the Environment and the Minister for Heritage and the Minister Assisting the Minister for Minister for the Environment and the Minister for Heritage.
Ground Water Dependent Ecosystems	GDEs	Groundwater Dependent Ecosystems (GDEs) are ecosystems that are partially or completely dependent on underground water for their existence or health.
Interim Biogeographic Regionalisation for Australia	IBRA	IBRA is a biogeographic regionalisation of Australia developed by the Australian Government's Department of Sustainability, Environment, Water, Population and Communities. It was developed for use as a planning tool, for example for the establishment of a National Reserve System.
Impact Footprint		Areas that will be physically disturbed during the process of implementing the proposal.
Likely		Taken to be a real chance or possibility (NPWS 1996).
Local Environmental Plan	LEP	A type of planning instrument made under Part 3 of the EP&A Act.
Local Government Area	LGA	
Local population		The population that occurs within a given Subject Site, unless the existence of contiguous or proximal occupied habitat and the movement of individuals or exchange of genetic material across the boundary can be demonstrated (NPWS 1996). In this instance a local population are those that occur within the Subject Site.
Low condition/Moderate to Good Condition (as per BBAM 2008).	Low Condition Moderate to Good Condition	Native woody vegetation is in low condition if: The over-storey per cent foliage cover is <25% of the lower value of the over-storey per cent foliage cover benchmark for that vegetation type AND <50% of groundcover vegetation is indigenous species, or >90% of the area is ploughed or fallow, or 90% of the groundcover vegetation is regrowth but not protected regrowth. Remnant native vegetation and protected regrowth cannot be cleared if it is a vegetation type that is >70% cleared and NOT in low condition (ie Moderate to Good).
Locality		Area within a 50km radius of the Subject Site.
Matters of national environmental significance.	MNES	Refers to the seven matters of national environmental significance as defined by the EPBC Act.
National Parks and Wildlife Act 1974 (NSW)	NPW Act	Under the National Parks and Wildlife Act, the Director-General of the NPWS is responsible for the care, control and management of all national parks, historic sites, nature reserves, reserves, Aboriginal areas and state game reserves. State conservation areas, karst conservation reserves and regional parks are also administered under the Act. The Director-General is also responsible under this legislation for the protection and care of native fauna and flora, and Aboriginal places and objects throughout NSW.

Terminology	Abbreviation	Description
Native Vegetation Act 2003 (NSW)	NV Act	The native vegetation legislation was introduced in 2005. The Native Vegetation Act 2003 (NV Act) and Native Vegetation Regulation 2005 (NV Regulation) has delivered: • the Government's commitment to end broad scale clearing, to protect the health of our land, rivers and wildlife • investment security and increased flexibility for farmers • new powers to local catchment management authorities (CMAs) to make decisions in the best interests of the community.
Noxious Weeds Act 1993 (NSW)	Noxious Weeds Act	An Act to provide for the identification, classification and control of noxious weeds.
NSW Office of Water	NOW	
Office of Environment and Heritage	OEH	Formally known as the Department of the Environment, Climate Change and Water (DECCW).
Potential Koala Habitat		SEPP 44: potential koala habitat means areas of native vegetation where the trees of the types listed in Schedule 2 constitute at least 15% of the total number of trees in the upper or lower strata of the tree component.
Regional Environmental Plan	REP	A type of planning instrument made under Part 3 of the EP&A Act.
Regional Vegetation Community	RVC	Regionally, a vegetation map for the Namoi CMA has been produced (ELA 2009a). This mapping product is underpinned by a Regional Vegetation Community (RVC) classification which is linked to the vegetation type classification in the *Biometric* Vegetation Types Database.
Rural Fires Act 1997 (NSW)	RF Act	
State Environmental Planning Policy (Infrastructure) 2007.	Infrastructure SEPP	The Infrastructure SEPP has specific planning and approval provisions for 25 types of infrastructure or facilities such as education, hospitals, roads, railways, emergency services, water supply and electricity generation and transmission. The SEPP assists the NSW Government agencies, local government, other private infrastructure providers and the communities they support by simplifying the planning process and by providing consistent planning provisions across all local government areas in NSW. The SEPP contains planning provisions including: • where the infrastructure facilities are permissible • what infrastructure development can be assessed and approved by a public authority under Part 5 of the Environmental Planning and Assessment (EP&A) Act 1979 • what infrastructure development requires consent under Part 4 of the EP&A Act • what infrastructure development is exempt or complying development.

Terminology	Abbreviation	Description
State Environmental Planning Policy No.44 – Koala Habitat	SEPP 44	This Policy aims to encourage the proper conservation and management of areas of natural vegetation that provide habitat for koalas to ensure a permanent free-living population over their present range and reverse the current trend of koala population decline: (a) by requiring the preparation of plans of management before development consent can be granted in relation to areas of core koala habitat, and (b) by encouraging the identification of areas of core koala habitat, and (c) by encouraging the inclusion of areas of core koala habitat in environment protection zones. Applicable for projects determined under Part 4 and 5 of the EP&A Act.
State Environmental Planning Policy	SEPP	A type of planning instrument made under Part 3 of the EP&A Act.
Strahler stream order		Strahler stream order and are used to define stream size based on a hierarchy of tributaries.
Subject Site		The Subject Site is the area that was targeted for ecological assessment and encompasses all aspects of the Proposal.
The Proposal		The proposed activity to be carried out by the Proponent as detailed in **Section 1.1** of this report.
Threatened species		A species specified in Schedule 1 Part 1 (endangered species), Part 4 (presumed extinct) and Schedule 2 (vulnerable species) of the TSC Act, within the schedules of the FM Act or within the Schedules of the EPBC Act.
Threatened Species Conservation Act 1995 (NSW)	TSC Act	The objects of this Act are as follows: (a) to conserve biological diversity and promote ecologically sustainable development, and (b) to prevent the extinction and promote the recovery of threatened species, populations and ecological communities, and (c) to protect the critical habitat of those threatened species, populations and ecological communities that are endangered, and (d) to eliminate or manage certain processes that threaten the survival or evolutionary development of threatened species, populations and ecological communities, and (e) to ensure that the impact of any action affecting threatened species, populations and ecological communities is properly assessed, and (f) to encourage the conservation of threatened species, populations and ecological communities by the adoption of measures involving co-operative management.

APPENDIX 2: DATABASE SEARCH RESULTS

DESKTOP DATABASE SEARCH RESULTS

A summary of databases searches indicated for TSC and EPBC listed species, ecological communities and populations. Copies of the OEH threatened species database search (TSC Act), NSW DPI records viewer (FM Act) and DoE Protected Matters (EPBC Act) threatened species database searches have been provided in the following table.

Name of database searched	Date of search	Type of search	Comment
DoE Register of Critical Habitat http://www.environment.gov.au/cgi-bin/sprat/public/publicregisterofcriticalhabitat.pl	4.1.2017	Subject Site	No critical habitat area registered in the Subject Site.
Department of Sustainability, Environment, Water, Population and Communities (DoE) Protected Matters (EPBC Act) Database. http://www.environment.gov.au/erin/ert/epbc/index.html	4.1.2017	Subject Site including 5km buffer	Listed Threatened Ecological Communities: 5 Listed Migratory Species: 14 Listed Threatened Species: 10 Listed Marine Species:11 Commonwealth Lands: 6 Places on the RNE: 13 Invasive Species: 26 Several species listed are known to occur or have habitat in the Subject Site.
Office of Environment and Heritage (OEH) Threatened Species online database: http://www.environment.nsw.gov.au/threatenedspecies/	4.1.2017	Combined geographic and habitat search in Central West (Talbragar Valley)	A search of the NSW OEH Threatened Species Profiles using Central West CMA Talbragar Valley subregion predicts 98 listed items as having potential to be present in the Subject Site.
BioNet Atlas of NSW Wildlife 2014. Data License agreement	4.1.2017	Licensed Report of all Valid Records of Threatened (listed on TSC Act 1995) ,Commonwealth listed ,CAMBA listed ,JAMBA listed or ROKAMBA listed Entities in selected area [North: -32.21 West: 148.57 East: 148.67 South: -32.31]	Search returned a total of 81 records of 30 species.
Department of Primary Industries Noxious Weeds http://weeds.dpi.nsw.gov.au/WeedDeclarations/Results	4.1.2017	Dubbo LGA	109 Noxious Weeds are listed as occurring in the Dubbo LGA. Many have the potential to occur in the Subject Site.
SEPP 44: Koala Habitat Protection http://www.legislation.nsw.gov.au/fragview/inforce/epi%2B5%2B1995%2Bcd%2B0%2BN?	4.1.2017	Dubbo LGA	Wellington LGA is not listed in SEPP Schedule 1 of the SEPP. Thus, SEPP 44 does not apply. Koalas are, however, known to occur in the Dubbo LGA and Fuzzy Box are Schedule 2 listed feed tree species. As such, SEPP 44 does not apply, however, koala habitat will be considered.
Office of Environment and Heritage (OEH) Key Threatening Processes. http://www.environment.nsw.gov.au/threatenedspe	4.1.2017		37 KTPs are currently listed under the TSC Act.

Name of database searched	Date of search	Type of search	Comment
cies/aboutKTPSinNSW.htm			
Department of Sustainability, Environment, Water, Population and Communities (DoE) Key Threatened Processes http://www.environment.gov.au/biodiversity/threatened/ktp.html	4.1.2017		19 KTPs are currently listed under the EPBC Act.
Bird Life Australia (Important Bird Areas: IBA) http://www.birdlife.org/datazone/site/search	4.1.2017	Subject Site	No IBA is located within the Subject Site. The Subject Site is situated directly south of the Goonoo IBA.
DPI Records Viewer http://www.dpi.nsw.gov.au/fisheries/species-protection/records/viewer	4.1.2017	Dubbo LGA	Three species of fish have been previously recorded in the Dubbo LGA. Including the: • Freshwater catfish population • Murray Cod • Trout Cod None of these species are likely to occur or have important habitat in the Subject Site. They all are likely to occur in the Macquarie River in Dubbo.
Atlas of Living Australia http://biocache.ala.org.au/explore/your-area	4.1.2017	10.0 km of point (-32.274452,148.63289	519 records of 51 species - State Conservation Endangered. No threatened species have been previously recorded in the Subject Site however this does not mean that they do not have habitat in the Subject Site. The Little Eagle, Grey-crowned Babbler and Speckled Warbler are the closest threatened species records.

OEH THREATENED SPECIES DATABASE RESULTS

CMA Sub Region & Profiles Report

18/09/2014

NSW GOVERNMENT Office of Environment & Heritage

CMA Sub-Region Profile ID	Scientific Name	Common Name	Occurrence
Central West - Talbragar Valley			
10056	Anseranas semipalmata	Magpie Goose	Known
10105	Botaurus poiciloptilus	Australasian Bittern	Predicted
10113	Burhinus grallarius	Bush Stone-curlew	Known
10116	Lophochroa leadbeateri	Major Mitchell's Cockatoo	Predicted
10140	Calyptorhynchus lathami	Glossy Black-Cockatoo	Known
10155	Cercartetus nanus	Eastern Pygmy-possum	Predicted
10157	Chalinolobus dwyeri	Large-eared Pied Bat	Predicted
10159	Chalinolobus picatus	Little Pied Bat	Known
10171	Climacteris picumnus victoriae	Brown Treecreeper (eastern subspecies)	Known
10207	Dasyurus maculatus	Spotted-tailed Quoll	Predicted
10221	Dichanthium setosum	Bluegrass	Predicted
10243	Diuris tricolor	Pine Donkey Orchid	Known
10259	Liopholis whitii	White's Skink	Predicted
10275	Ephippiorhynchus asiaticus	Black-necked Stork	Predicted
10330	Falco hypoleucos	Grey Falcon	Known
10335	Fuzzy Box Woodland on alluvial Soils of the South Western Slopes, Darling Riverine Plains and Brigalow Belt South Bioregions	Fuzzy Box Woodland on alluvial Soils of the South Western Slopes, Darling Riverine Plains and Brigalow Belt South Bioregions	Known
10354	Goodenia macbarronii	Narrow Goodenia	Predicted
10382	Grus rubicunda	Brolga	Predicted
10395	Hamirostra melanosternon	Black-breasted Buzzard	Predicted
10412	Hoplocephalus bitorquatus	Pale-headed Snake	Predicted
10455	Lathamus discolor	Swift Parrot	Predicted
10459	Leipoa ocellata	Malleefowl	Predicted
10479	Limosa limosa	Black-tailed Godwit	Predicted
10495	Lophoictinia isura	Square-tailed Kite	Known
10519	Melanodryas cucullata cucullata	Hooded Robin (south-eastern form)	Known
10523	Melithreptus gularis gularis	Black-chinned Honeyeater (eastern subspecies)	Known
10555	Neophema pulchella	Turquoise Parrot	Known
10561	Ninox connivens	Barking Owl	Known
10568	Nyctophilus corbeni	Corben's Long-eared Bat	Known
10580	Oxyura australis	Blue-billed Duck	Known
10582	Pachycephala inornata	Gilbert's Whistler	Predicted
10604	Petaurus norfolcensis	Squirrel Glider	Known
10616	Phascolarctos cinereus	Koala	Known
10621	Philotheca ericifolia	Philotheca ericifolia	Known
10645	Polytelis swainsonii	Superb Parrot	Known

Page 1 of 3

CMA Sub-Region Profile ID	Scientific Name	Common Name	Occurrence
10656	Pomaderris queenslandica	Scant Pomaderris	Predicted
10660	Pomatostomus temporalis temporalis	Grey-crowned Babbler (eastern subspecies)	Known
10722	Chthonicola sagittata	Speckled Warbler	Known
10734	Rostratula australis	Australian Painted Snipe	Known
10735	Rulingia procumbens	Rulingia procumbens	Known
10741	Saccolaimus flaviventris	Yellow-bellied Sheathtail-bat	Known
10759	Sminthopsis macroura	Stripe-faced Dunnart	Predicted
10768	Stagonopleura guttata	Diamond Firetail	Known
10771	Stictonetta naevosa	Freckled Duck	Predicted
10783	Swainsona sericea	Silky Swainson-pea	Known
10815	Tylophora linearis	Tylophora linearis	Known
10820	Tyto novaehollandiae	Masked Owl	Predicted
10837	White Box Yellow Box Blakely's Red Gum Woodland	White Box Yellow Box Blakely's Red Gum Woodland	Known
10841	Anthochaera phrygia	Regent Honeyeater	Known
10857	Zieria ingramii	Keith's Zieria	Known
20001	Alteration of habitat following subsidence due to longwall mining	Alteration of habitat following subsidence due to longwall mining	Predicted
20002	Alteration to the natural flow regimes of rivers and streams and their floodplains and wetlands	Alteration to the natural flow regimes of rivers and streams and their floodplains and wetlands	Predicted
20003	Infection by Psittacine Circoviral (beak and feather) Disease affecting endangered psittacine species and populations	Infection by Psittacine Circoviral (beak and feather) Disease affecting endangered psittacine species and populations	Predicted
20004	Competition from feral honey bees, Apis mellifera L.	Competition from feral honey bees, Apis mellifera L.	Predicted
20005	Introduction of the Large Earth Bumblebee Bombus terrestris (L.)	Introduction of the Large Earth Bumblebee Bombus terrestris (L.)	Predicted
20006	Bushrock removal	Bushrock removal	Predicted
20007	Loss or degradation (or both) of sites used for hill-topping by butterflies	Loss or degradation (or both) of sites used for hill-topping by butterflies	Predicted
20008	Predation by the Feral Cat Felis catus (Linnaeus, 1758)	Predation by the Feral Cat Felis catus (Linnaeus, 1758)	Predicted
20009	Infection of frogs by amphibian chytrid causing the disease chytridiomycosis	Infection of frogs by amphibian chytrid causing the disease chytridiomycosis	Predicted
20010	Invasion of the Yellow Crazy Ant, Anoplolepis gracilipes (Fr. Smith) into NSW	Invasion of the Yellow Crazy Ant, Anoplolepis gracilipes (Fr. Smith) into NSW	Predicted
20011	Removal of dead wood and dead trees	Removal of dead wood and dead trees	Predicted
20012	Herbivory and environmental degradation caused by feral deer	Herbivory and environmental degradation caused by feral deer	Predicted
20014	High frequency fire resulting in the disruption of life cycle processes in plants and animals and loss of vegetation structure and composition	High frequency fire resulting in the disruption of life cycle processes in plants and animals and loss of vegetation structure and composition	Predicted
20015	Predation by the European Red Fox Vulpes Vulpes (Linnaeus, 1758)	Predation by the European Red Fox Vulpes Vulpes (Linnaeus, 1758)	Predicted
20016	Predation by Gambusia holbrooki Girard, 1859 (Plague Minnow or Mosquito Fish)	Predation by Gambusia holbrooki Girard, 1859 (Plague Minnow or Mosquito Fish)	Predicted
20017	Competition and habitat degradation by Feral Goats, Capra hircus Linnaeus 1758	Competition and habitat degradation by Feral Goats, Capra hircus Linnaeus 1758	Predicted
20018	Invasion of native plant communities by exotic perennial grasses	Invasion of native plant communities by exotic perennial grasses	Predicted
20020	Predation, habitat degradation, competition and disease transmission by Feral Pigs, Sus scrofa Linnaeus 1758	Predation, habitat degradation, competition and disease transmission by Feral Pigs, Sus scrofa Linnaeus 1758	Predicted
20021	Importation of Red Imported Fire Ants Solenopsis invicta Buren 1972	Importation of Red Imported Fire Ants Solenopsis invicta Buren 1972	Predicted
20023	Clearing of native vegetation	Clearing of native vegetation	Predicted

CMA Sub-Region Profile ID	Scientific Name	Common Name	Occurrence
20024	Competition and grazing by the feral European Rabbit, Oryctolagus cuniculus (L.)	Competition and grazing by the feral European Rabbit, Oryctolagus cuniculus (L.)	Predicted
20025	Anthropogenic Climate Change	Anthropogenic Climate Change	Predicted
20026	Infection of native plants by Phytophthora cinnamomi	Infection of native plants by Phytophthora cinnamomi	Predicted
20027	Invasion of native plant communities by Chrysanthemoides monilifera	Invasion of native plant communities by Chrysanthemoides monilifera	Predicted
20043	Invasion and establishment of the Cane Toad (Bufo marinus)	Invasion and establishment of the Cane Toad (Bufo marinus)	Predicted
20044	Invasion, establishment and spread of Lantana (Lantana camara L. sens. Lat)	Invasion, establishment and spread of Lantana (Lantana camara L. sens. Lat)	Predicted
20052	Invasion and establishment of exotic vines and scramblers	Invasion and establishment of exotic vines and scramblers	Predicted
20061	Acacia ausfeldii	Ausfeld's Wattle	Known
20065	Invasion and establishment of Scotch Broom (Cytisus scoparius)	Invasion and establishment of Scotch Broom (Cytisus scoparius)	Predicted
20072	Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions	Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions	Known
20079	Loss of Hollow-bearing Trees	Loss of Hollow-bearing Trees	Predicted
20088	Crinia sloanei	Sloane's Froglet	Predicted
20108	Forest eucalypt dieback associated with over-abundant psyllids and Bell Miners	Forest eucalypt dieback associated with over-abundant psyllids and Bell Miners	Predicted
20111	Glossopsitta pusilla	Little Lorikeet	Known
20116	Predation and hybridisation by Feral Dogs, Canis lupus familiaris	Predation and hybridisation by Feral Dogs, Canis lupus familiaris	Predicted
20129	Petroica phoenicea	Flame Robin	Known
20131	Hieraaetus morphnoides	Little Eagle	Known
20133	Petroica boodang	Scarlet Robin	Known
20134	Circus assimilis	Spotted Harrier	Known
20135	Daphoenositta chrysoptera	Varied Sittella	Known
20143	Epthianura albifrons	White-fronted Chat	Known
20153	Invasion of native plant communities by African Olive Olea europaea subsp. cuspidata (Wall. ex G. Don) Cif.	Invasion of native plant communities by African Olive Olea europaea subsp. cuspidata (Wall. ex G. Don) Cif.	Predicted
20240	Bothriochloa biloba	Lobed Bluegrass	Known
20265	Loss and degradation of native plant and animal habitat by invasion of escaped garden plants, including aquatic plants	Loss and degradation of native plant and animal habitat by invasion of escaped garden plants, including aquatic plants	Predicted
20271	Aggressive exclusion of birds from woodland and forest habitat by abundant Noisy Miners Manorina melanocephala	Aggressive exclusion of birds from woodland and forest habitat by abundant Noisy Miners Manorina melanocephala	Predicted

DoE Protected Matters

Summary

Matters of National Environmental Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance.

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance:	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Areas:	None
Listed Threatened Ecological Communities:	5
Listed Threatened Species:	14
Listed Migratory Species:	10

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place and the heritage values of a place on the Register of the National Estate.

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Land:	6
Commonwealth Heritage Places:	None
Listed Marine Species:	11
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Commonwealth Reserves Marine	None

Extra Information

This part of the report provides information that may also be relevant to the area you have nominated.

Place on the RNE:	13
State and Territory Reserves:	None
Regional Forest Agreements:	None
Invasive Species:	26
Nationally Important Wetlands:	None
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

Listed Threatened Ecological Communities [Resource Information]

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Name	Status	Type of Presence
Coolibah - Black Box Woodlands of the Darling Riverine Plains and the Brigalow Belt South Bioregions	Endangered	Community may occur within area
Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia	Endangered	Community likely to occur within area
Natural grasslands on basalt and fine-textured alluvial plains of northern New South Wales and southern Queensland	Critically Endangered	Community may occur within area
Weeping Myall Woodlands	Endangered	Community may occur within area
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Critically Endangered	Community likely to occur within area

Listed Threatened Species [Resource Information]

Name	Status	Type of Presence
Birds		
Anthochaera phrygia Regent Honeyeater [82338]	Endangered	Species or species habitat known to occur within area
Lathamus discolor Swift Parrot [744]	Endangered	Species or species habitat likely to occur within area
Leipoa ocellata Malleefowl [934]	Vulnerable	Species or species habitat may occur within area
Polytelis swainsonii Superb Parrot [738]	Vulnerable	Species or species habitat known to occur within area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat may occur within area

Name	Status	Type of Presence
Fish		
Bidyanus bidyanus Silver Perch, Bidyan [76155]	Critically Endangered	Species or species habitat may occur within area
Maccullochella macquariensis Trout Cod [26171]	Endangered	Species or species habitat may occur within area
Maccullochella peelii Murray Cod [66633]	Vulnerable	Species or species habitat may occur within area
Mammals		
Chalinolobus dwyeri Large-eared Pied Bat, Large Pied Bat [183]	Vulnerable	Species or species habitat likely to occur within area
Nyctophilus corbeni South-eastern Long-eared Bat [83395]	Vulnerable	Species or species habitat known to occur within area
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT) Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Vulnerable	Species or species habitat may occur within area
Plants		
Androcalva procumbens [87153]	Vulnerable	Species or species habitat likely to occur within area
Tylophora linearis [55231]	Endangered	Species or species habitat may occur within area
Reptiles		
Aprasia parapulchella Pink-tailed Worm-lizard, Pink-tailed Legless Lizard [1665]	Vulnerable	Species or species habitat may occur within area

Listed Migratory Species [Resource Information]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Migratory Marine Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Migratory Terrestrial Species		
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area
Hirundapus caudacutus White-throated Needletail [682]		Species or species habitat known to occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat may occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area
Migratory Wetlands Species		

Name	Status	Type of Presence
Fish		
Bidyanus bidyanus Silver Perch, Bidyan [76155]	Critically Endangered	Species or species habitat may occur within area
Maccullochella macquariensis Trout Cod [26171]	Endangered	Species or species habitat may occur within area
Maccullochella peelii Murray Cod [66633]	Vulnerable	Species or species habitat may occur within area
Mammals		
Chalinolobus dwyeri Large-eared Pied Bat, Large Pied Bat [183]	Vulnerable	Species or species habitat likely to occur within area
Nyctophilus corbeni South-eastern Long-eared Bat [83395]	Vulnerable	Species or species habitat known to occur within area
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT) Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Vulnerable	Species or species habitat may occur within area
Plants		
Androcalva procumbens [87153]	Vulnerable	Species or species habitat likely to occur within area
Tylophora linearis [55231]	Endangered	Species or species habitat may occur within area
Reptiles		
Aprasia parapulchella Pink-tailed Worm-lizard, Pink-tailed Legless Lizard [1665]	Vulnerable	Species or species habitat may occur within area

Listed Migratory Species [Resource Information]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Migratory Marine Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Migratory Terrestrial Species		
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area
Hirundapus caudacutus White-throated Needletail [682]		Species or species habitat known to occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat may occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area
Migratory Wetlands Species		

Name	Threatened	Type of Presence
Ardea alba Great Egret, White Egret [59541]		Species or species habitat likely to occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area
Rostratula benghalensis (sensu lato) Painted Snipe [889]	Endangered*	Species or species habitat may occur within area

Other Matters Protected by the EPBC Act

Commonwealth Land [Resource Information]

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Name
Commonwealth Land -
Commonwealth Land - Australian Postal Commission
Commonwealth Land - Australian Telecommunications Commission
Commonwealth Land - Commonwealth Bank of Australia
Defence - DUBBO - HUTTED CAMP SITE
Defence - DUBBO TRAINING DEPOT

Listed Marine Species [Resource Information]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardea alba Great Egret, White Egret [59541]		Species or species habitat likely to occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area
Hirundapus caudacutus White-throated Needletail [682]		Species or species habitat known to occur within area
Lathamus discolor Swift Parrot [744]	Endangered	Species or species habitat likely to occur within area

Name	Threatened	Type of Presence
Merops ornatus		
Rainbow Bee-eater [670]		Species or species habitat may occur within area
Myiagra cyanoleuca		
Satin Flycatcher [612]		Species or species habitat may occur within area
Rhipidura rufifrons		
Rufous Fantail [592]		Species or species habitat known to occur within area
Rostratula benghalensis (sensu lato)		
Painted Snipe [889]	Endangered*	Species or species habitat may occur within area

Extra Information

Places on the RNE [Resource Information]

Note that not all Indigenous sites may be listed.

Name	State	Status
Historic		
Dubbo High School Main Building	NSW	Indicative Place
Dubbo Pioneer Cemetery	NSW	Indicative Place
Dubbo Showground Grandstand	NSW	Indicative Place
Eastonville	NSW	Indicative Place
Salvation Army Citadel (former)	NSW	Indicative Place
Dubbo Courthouse	NSW	Registered
Dundullimal Homestead and Stone Barn	NSW	Registered
Gaol (former) and Residence	NSW	Registered
Lands Board Office Building	NSW	Registered
Police Inspectors Residence	NSW	Registered
Public School	NSW	Registered
RAAF Base Dubbo (former)	NSW	Registered
Talbragar Shire Council Chambers (former)	NSW	Registered

Invasive Species [Resource Information]

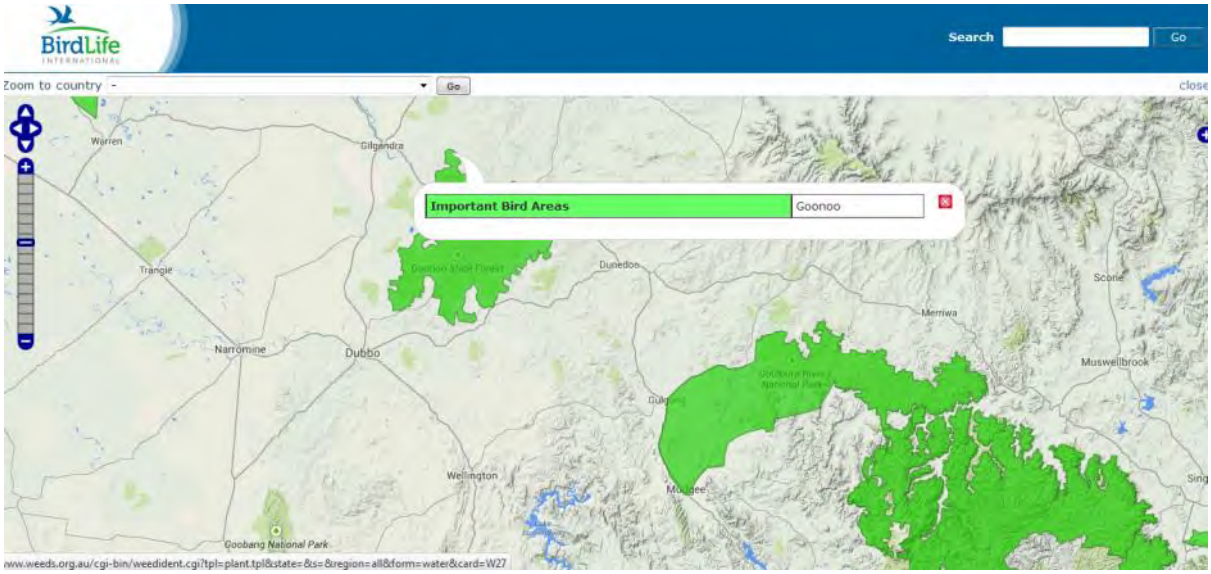
Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resouces Audit, 2001.

Name	Status	Type of Presence
Birds		
Acridotheres tristis		
Common Myna, Indian Myna [387]		Species or species habitat likely to occur within area
Anas platyrhynchos		
Mallard [974]		Species or species habitat likely to occur within area
Carduelis carduelis		
European Goldfinch [403]		Species or species habitat likely to occur within area

Name	Status	Type of Presence
Columba livia Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
Passer domesticus House Sparrow [405]		Species or species habitat likely to occur within area
Streptopelia chinensis Spotted Turtle-Dove [780]		Species or species habitat likely to occur within area
Sturnus vulgaris Common Starling [389]		Species or species habitat likely to occur within area
Turdus merula Common Blackbird, Eurasian Blackbird [596]		Species or species habitat likely to occur within area
Mammals		
Bos taurus Domestic Cattle [16]		Species or species habitat likely to occur within area
Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Lepus capensis Brown Hare [127]		Species or species habitat likely to occur within area
Mus musculus House Mouse [120]		Species or species habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Rattus rattus Black Rat, Ship Rat [84]		Species or species habitat likely to occur within area
Sus scrofa Pig [6]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		
Asparagus asparagoides Bridal Creeper, Bridal Veil Creeper, Smilax, Florist's Smilax, Smilax Asparagus [22473]		Species or species habitat likely to occur within area
Lycium ferocissimum African Boxthorn, Boxthorn [19235]		Species or species habitat likely to occur within area
Opuntia spp. Prickly Pears [82753]		Species or species habitat likely to occur within area
Pinus radiata Radiata Pine Monterey Pine, Insignis Pine, Wilding Pine [20780]		Species or species habitat may occur within

Name	Status	Type of Presence
		area
Rubus fruticosus aggregate Blackberry, European Blackberry [68406]		Species or species habitat likely to occur within area
Sagittaria platyphylla Delta Arrowhead, Arrowhead, Slender Arrowhead [68483]		Species or species habitat likely to occur within area
Salix spp. except S.babylonica, S.x calodendron & S.x reichardtii Willows except Weeping Willow, Pussy Willow and Sterile Pussy Willow [68497]		Species or species habitat likely to occur within area
Senecio madagascariensis Fireweed, Madagascar Ragwort, Madagascar Groundsel [2624]		Species or species habitat likely to occur within area
Tamarix aphylla Athel Pine, Athel Tree, Tamarisk, Athel Tamarisk, Athel Tamarix, Desert Tamarisk, Flowering Cypress, Salt Cedar [16018]		Species or species habitat likely to occur within area

BIRDLIFE INTERNATIONAL-IMPORTANT BIRD AREAS



ATLAS OF LIVING AUSTRALIA

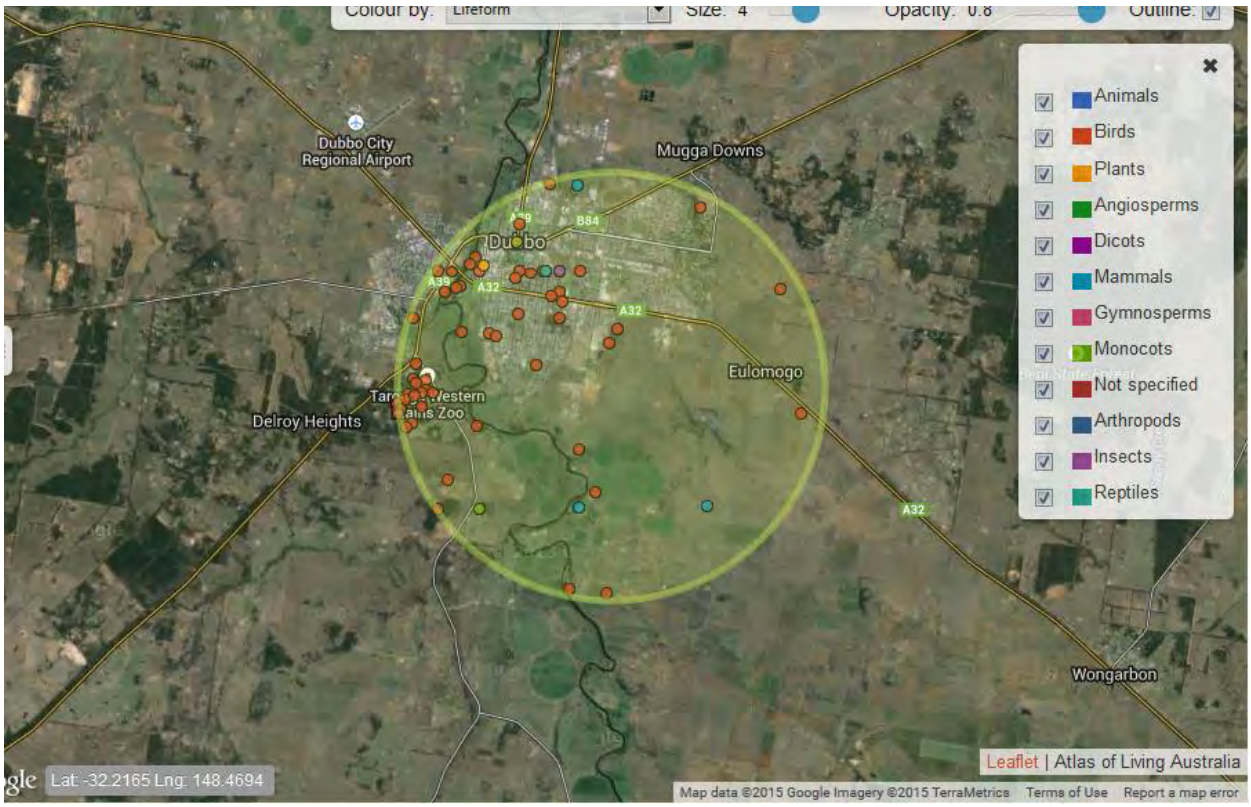
5KM CIRCLE

44 species recorded: 206 results for [all records] - within 5.0 km of point (-32.274452, 148.63289) State Conservation Endangered.

Name of species	Number of records
Australian Painted Snipe Rostratula australis	4
Barking Owl Ninox (Hieracoglaux) connivens	7
Bindjulang Dasyurus maculatus	2
Black Callitris Callitris endlicheri	5
Black-chinned Honeyeater Melithreptus (Eidopsarus) gularis gularis	1
Blue-billed Duck Oxyura australis	3
Brolga Grus (Mathewsia) rubicunda	1
Brown Treecreeper (eastern Subspecies) Climacteris (Climacteris) picumnus victoriae	2
Bush Stone-curlew Burhinus (Burhinus) grallarius	3
Diamond Firetail Stagonopleura (Stagonopleura) guttata	3
Emu # Dromaius novaehollandiae #	4
Flame Robin Petroica (Littlera) phoenicea	1
Glossy Black-cockatoo Calyptorhynchus (Calyptorhynchus) lathami	16
Golden Sun Moth Synemon plana	1
Grey Falcon Falco (Hierofalco) hypoleucos	1
Grey-crowned Babbler Pomatostomus (Pomatostomus) temporalis temporalis	12
Homoranthus Darwinioides Homoranthus darwinioides	1
Ingram's Zieria Zieria ingramii	1
Leafless Indigo Indigofera efoliata	9
Little Eagle Hieraaetus (Hieraaetus) morphnoides	16
Little Lorikeet Glossopsitta pusilla	17
Magpie Goose Anseranas semipalmata	3
Major Mitchell's Cockatoo Lophochroa leadbeateri	3
Malleefowl Leipoa ocellata	11
Mauve Burr-daisy Calotis glandulosa	2
Painted Honeyeater Grantiella picta	3
Pale-headed Snake Hoplocephalus bitorquatus	1
Red-tailed Tropicbird Phaethon rubricauda	1
Regent Honeyeater Anthochaera (Xanthomyza) phrygia	12
River Red Gum # Eucalyptus camaldulensis #	3
Rulingia Procumbens Rulingia procumbens	2
Silky Glycine Glycine canescens	1
Speckled Warbler Chthonicola sagittata	19
Spotted Harrier Circus assimilis	6
Spotted-throat Cowslip Diuris tricolor	3
Square-tailed Kite Lophoictinia isura	3
Stripe-faced Dunnart Sminthopsis macroura	9
Superb Parrot Polytelis swainsonii	4

Swamp Bush-pea # Pultenaea glabra #	**1**
Swift Parrot Lathamus discolor	**2**
Varied Sittella Daphoenositta (Neositta) chrysoptera	**4**
Weeping Myall Acacia pendula	**1**
White-browed Treecreeper Climacteris (Climacterobates) affinis affinis	**1**
White-fronted Chat Epthianura (Epthianura) albifrons	**1**
Grand Total	**206**

Not listed under TSC or EPBC Act in the Dubbo LGA

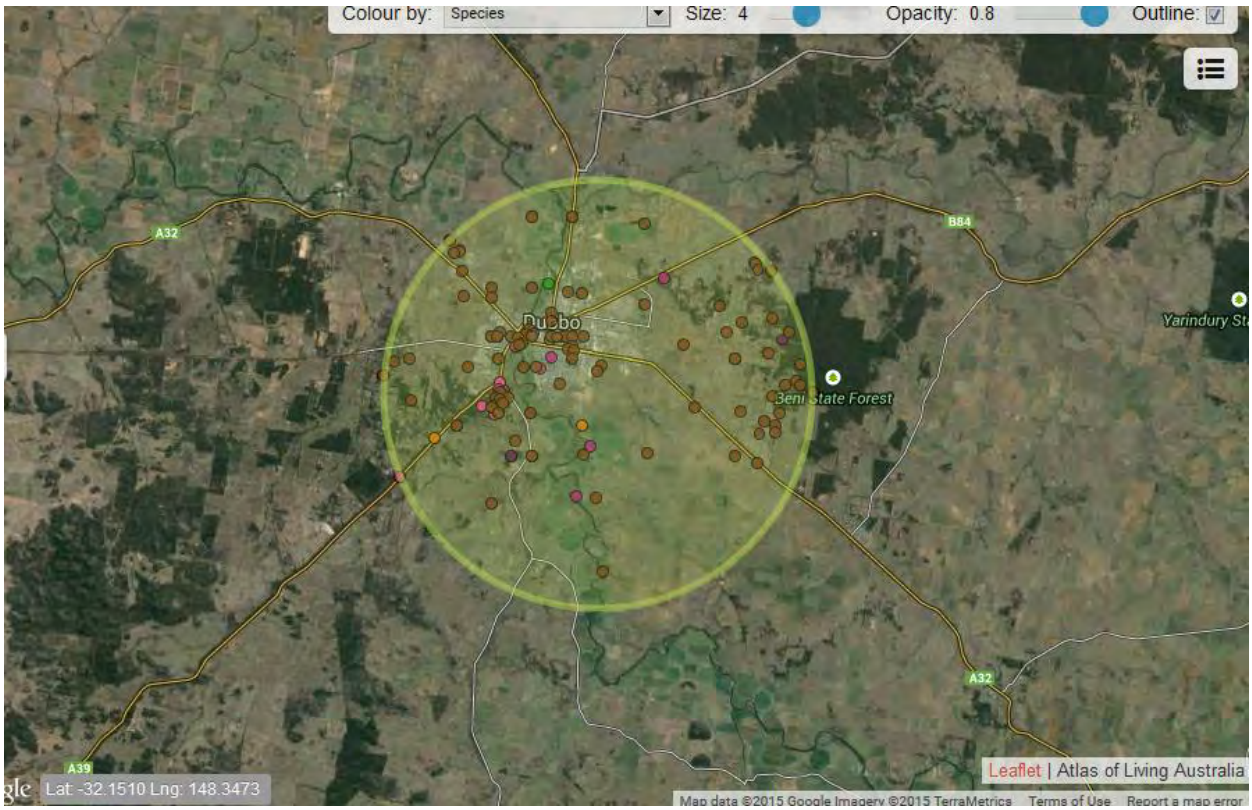


10KM CIRCLE

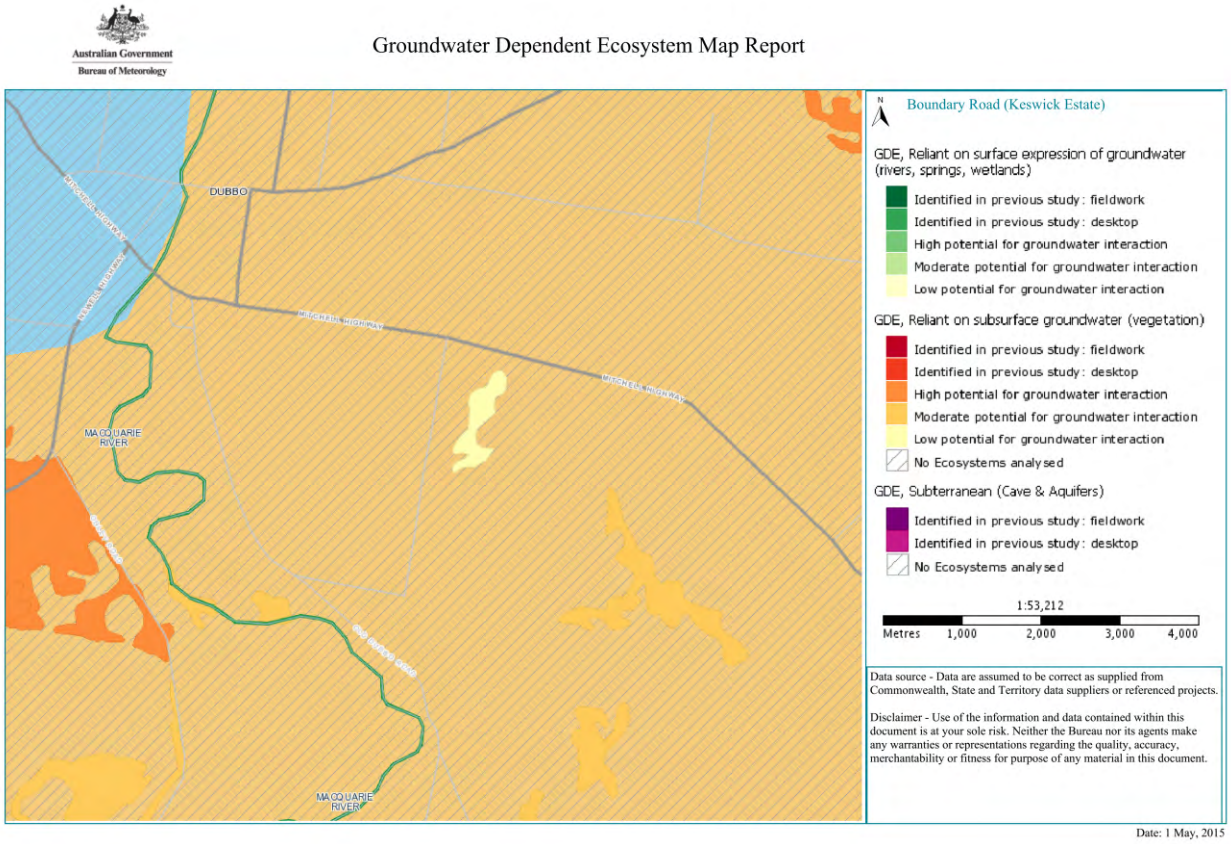
51 species: 519 results for [all records] - within 10.0 km of point (-32.274452, 148.63289) State Conservation Endangered

Name of species	Number of records
Acacia pendula Weeping Myall	2
Anseranas semipalmata Magpie Goose	8
Anthochaera (Xanthomyza) Phrygia Regent Honeyeater	14
Burhinus (Burhinus) grallarius Bush Stone-curlew	4
Calidris (Erolia) ferruginea Curlew Sandpiper	2
Callitris endlicheri Black Callitris	8
Calotis glandulosa Mauve Burr-daisy	2
Calyptorhynchus (Calyptorhynchus) lathami Glossy Black-cockatoo	16
Chalinolobus picatus Little Pied Bat	3

Chthonicola sagittata Speckled Warbler	68
Circus assimilis Spotted Harrier	21
Climacteris (Climacteris) picumnus victoriae Brown Treecreeper (eastern Subspecies)	4
Climacteris (Climacterobates) affinis affinis White-browed Treecreeper	1
Daphoenositta (Neositta) chrysoptera Varied Sittella	20
Dasyurus maculatus Bindjulang	2
Diuris tricolor Spotted-throat Cowslip	8
Dromaius novaehollandiae Emu	18
Epthianura (Epthianura) albifrons White-fronted Chat	14
Eucalyptus camaldulensis River Red Gum	5
Falco (Hierofalco) hypoleucos Grey Falcon	1
Geophaps (Geophaps) scripta Squatter Pigeon	1
Glossopsitta pusilla Little Lorikeet	45
Glycine canescens Silky Glycine	2
Grantiella picta Painted Honeyeater	4
Grus (Mathewsia) rubicunda Brolga	2
Hamirostra melanosternon Black-breasted Buzzard	2
Hieraaetus (Hieraaetus) morphnoides Little Eagle	76
Homoranthus darwinioides Homoranthus Darwinioides	1
Hoplocephalus bitorquatus Pale-headed Snake	1
Indigofera efoliata Leafless Indigo	11
Lathamus discolor Swift Parrot	2
Leipoa ocellata Malleefowl	13
Lophochroa leadbeateri Major Mitchell's Cockatoo	5
Lophoictinia isura Square-tailed Kite	4
Melanodryas (Melanodryas) cucullata cucullata Hooded Robin	1
Melithreptus (Eidopsarus) gularis gularis Black-chinned Honeyeater	1
Neophema (Neophema) pulchella Turquoise Parrot	1
Ninox (Hieracoglaux) connivens Barking Owl	11
Oxyura australis Blue-billed Duck	5
Pachycephala (Timixos) inornata Gilbert's Whistler	5
Petroica (Littlera) phoenicea Flame Robin	10
Phaethon rubricauda Red-tailed Tropicbird	5
Polytelis swainsonii Superb Parrot	7
Pomatostomus (Pomatostomus) temporalis temporalis Grey-crowned Babbler	36
Pultenaea glabra Swamp Bush-pea	1
Rostratula australis Australian Painted Snipe	12
Rulingia procumbens Rulingia Procumbens	3
Sminthopsis macroura Stripe-faced Dunnart	9
Stagonopleura (Stagonopleura) guttata Diamond Firetail	20
Synemon plana Golden Sun Moth	1
Zieria ingramii Ingram's Zieria	1
Grand Total	**519**



ATLAS OF GROUNDWATER DEPENDENT ECOSYSTEMS



DUBBO REGIONAL COUNCIL NOXIOUS WEED LIST

African boxthorn	4	Locally Controlled Weed
Lycium ferocissimum		*The growth of the plant must be managed in a manner that continuously inhibits the ability of the plant to spread and the plant must not be sold, propagated or knowingly distributed*
African feather grass	5	Restricted Plant
Pennisetum macrourum		*The requirements in the Noxious Weeds Act 1993 for a notifiable weed must be complied with*
African turnip weed - eastern	5	Restricted Plant
Sisymbrium thellungii		*The requirements in the Noxious Weeds Act 1993 for a notifiable weed must be complied with*
African turnip weed - western	5	Restricted Plant
Sisymbrium runcinatum		*The requirements in the Noxious Weeds Act 1993 for a notifiable weed must be complied with*
Alligator weed	2	Regionally Prohibited Weed
Alternanthera philoxeroides		*The plant must be eradicated from the land and that land must be kept free of the plant*
Anchored water hyacinth	1	State Prohibited Weed
Eichhornia azurea		*The plant must be eradicated from the land and that land must be kept free of the plant*
Annual ragweed	5	Restricted Plant
Ambrosia artemisiifolia		*The requirements in the Noxious Weeds Act 1993 for a notifiable weed must be complied with*
Arrowhead	4	Locally Controlled Weed
Sagittaria montevidensis		*The plant must not be sold, propagated or knowingly distributed*
Artichoke thistle	5	Restricted Plant
Cynara cardunculus		*The requirements in the Noxious Weeds Act 1993 for a notifiable weed must be complied with*
Asparagus - climbing asparagus fern	4	Locally Controlled Weed
Asparagus plumosus		*The plant must not be sold, propagated or knowingly distributed*
Asparagus - ground asparagus	4	Locally Controlled Weed
Asparagus aethiopicus		*The plant must not be sold, propagated or knowingly distributed*
Asparagus weeds	4	Locally Controlled Weed
Asparagus species		*The plant must not be sold, propagated or knowingly distributed*
Athel pine	5	Restricted Plant
Tamarix aphylla		*The requirements in the Noxious Weeds Act 1993 for a notifiable weed must be complied with*
Bear-skin fescue	5	Restricted Plant
Festuca gautieri		*The requirements in the Noxious Weeds Act 1993 for a notifiable weed must be complied with*
Black knapweed	1	State Prohibited Weed
Centaurea nigra		*The plant must be eradicated from the land and that land must be kept free of the plant*
Black willow	2	Regionally Prohibited Weed
Salix nigra		*The plant must be eradicated from the land and that land must be kept free of the plant*
Blackberry	4	Locally Controlled Weed
Rubus fruticosus species aggregate		*The growth of the plant must be managed in a manner that continuously inhibits the ability of the plant to spread and the plant must not be sold, propagated or knowingly distributed*

Blue heliotrope	4	Locally Controlled Weed
Heliotropium amplexicaule		*The growth of the plant must be managed in a manner that continuously inhibits the ability of the plant to spread*
Boneseed	1	State Prohibited Weed
Chrysanthemoides monilifera subsp. *monilifera*		*The plant must be eradicated from the land and that land must be kept free of the plant*
Bridal creeper	4	Locally Controlled Weed
Asparagus asparagoides		*The growth of the plant must be managed in a manner that continuously inhibits the ability of the plant to spread and the plant must not be sold, propagated or knowingly distributed*
Bridal veil creeper	1	State Prohibited Weed
Asparagus declinatus		*The plant must be eradicated from the land and that land must be kept free of the plant*
Broomrapes	1	State Prohibited Weed
Orobanche species		*The plant must be eradicated from the land and that land must be kept free of the plant*
Burr ragweed	5	Restricted Plant
Ambrosia confertiflora		*The requirements in the Noxious Weeds Act 1993 for a notifiable weed must be complied with*
Cabomba	5	Restricted Plant
Cabomba species		*The requirements in the Noxious Weeds Act 1993 for a notifiable weed must be complied with*
Cape broom	4	Locally Controlled Weed
Genista monspessulana		*The growth of the plant must be managed in a manner that continuously inhibits the ability of the plant to spread and the plant must not be sold, propagated or knowingly distributed*
Cat's claw creeper	2	Regionally Prohibited Weed
Dolichandra unguis-cati		*The plant must be eradicated from the land and that land must be kept free of the plant*
Cayenne snakeweed	5	Restricted Plant
Stachytarpheta cayennensis		*The requirements in the Noxious Weeds Act 1993 for a notifiable weed must be complied with*
Chilean needle grass	4	Locally Controlled Weed
Nassella neesiana		*The growth of the plant must be managed in a manner that continuously inhibits the ability of the plant to spread and the plant must not be sold, propagated or knowingly distributed*
Chinese violet	1	State Prohibited Weed
Asystasia gangetica subsp. *micrantha*		*The plant must be eradicated from the land and that land must be kept free of the plant*
Clockweed	5	Restricted Plant
Gaura parviflora		*The requirements in the Noxious Weeds Act 1993 for a notifiable weed must be complied with*
Columbus grass	4	Locally Controlled Weed
Sorghum x *almum*		*The growth of the plant must be managed in a manner that continuously inhibits the ability of the plant to spread*
Coolatai grass	3	Regionally Controlled Weed
Hyparrhenia hirta		*The plant must be fully and continuously suppressed and destroyed and the plant must not be sold, propagated or knowingly distributed*
Corn sowthistle	5	Restricted Plant
Sonchus arvensis		*The requirements in the Noxious Weeds Act 1993 for a notifiable weed must be complied with*
Dodder	5	Restricted Plant

Cuscuta species		*The requirements in the Noxious Weeds Act 1993 for a notifiable weed must be complied with*
Espartillo - broad kernel	5	Restricted Plant
Amelichloa caudata		*The requirements in the Noxious Weeds Act 1993 for a notifiable weed must be complied with*
Espartillo - narrow kernel	5	Restricted Plant
Amelichloa brachychaeta		*The requirements in the Noxious Weeds Act 1993 for a notifiable weed must be complied with*
Eurasian water milfoil	1	State Prohibited Weed
Myriophyllum spicatum		*The plant must be eradicated from the land and that land must be kept free of the plant*
European hackberry	4	Locally Controlled Weed
Celtis australis		*The growth of the plant must be managed in a manner that continuously inhibits the ability of the plant to spread*
Fine-bristled burr grass	5	Restricted Plant
Cenchrus brownii		*The requirements in the Noxious Weeds Act 1993 for a notifiable weed must be complied with*
Fireweed	4	Locally Controlled Weed
Senecio madagascariensis		*The plant must not be sold, propagated or knowingly distributed*
Flax-leaf broom	4	Locally Controlled Weed
Genista linifolia		*The plant must not be sold, propagated or knowingly distributed*
Fountain grass	5	Restricted Plant
Cenchrus setaceus		*The requirements in the Noxious Weeds Act 1993 for a notifiable weed must be complied with*
Frogbit	1	State Prohibited Weed
Limnobium laevigatum		*The plant must be eradicated from the land and that land must be kept free of the plant*
Gallon's curse	5	Restricted Plant
Cenchrus biflorus		*The requirements in the Noxious Weeds Act 1993 for a notifiable weed must be complied with*
Gamba grass	5	Restricted Plant
Andropogon gayanus		*The requirements in the Noxious Weeds Act 1993 for a notifiable weed must be complied with*
Giant reed	4	Locally Controlled Weed
Arundo donax		*The plant must not be sold, propagated or knowingly distributed*
Glaucous starthistle	5	Restricted Plant
Carthamus leucocaulos		*The requirements in the Noxious Weeds Act 1993 for a notifiable weed must be complied with*
Golden thistle	5	Restricted Plant
Scolymus hispanicus		*The requirements in the Noxious Weeds Act 1993 for a notifiable weed must be complied with*
Green cestrum	3	Regionally Controlled Weed
Cestrum parqui		*The plant must be fully and continuously suppressed and destroyed*
Grey sallow	2	Regionally Prohibited Weed
Salix cinerea		*The plant must be eradicated from the land and that land must be kept free of the plant*
Harrisia cactus	4	Locally Controlled Weed
Harrisia species		*The growth of the plant must be managed in a manner that continuously inhibits the ability of the plant to spread and the plant must not be sold, propagated or knowingly distributed*
Hawkweeds	1	State Prohibited Weed

Hieracium species		*The plant must be eradicated from the land and that land must be kept free of the plant*
Honey locust	3	Regionally Controlled Weed
Gleditsia triacanthos		*The plant must be fully and continuously suppressed and destroyed and the plant must not be sold, propagated or knowingly distributed*
Horsetails	1	State Prohibited Weed
Equisetum species		*The plant must be eradicated from the land and that land must be kept free of the plant*
Hydrocotyl	1	State Prohibited Weed
Hydrocotyl ranunculoides		*The plant must be eradicated from the land and that land must be kept free of the plant*
Hymenachne	1	State Prohibited Weed
Hymenachne amplexicaulis and hybrids		*The plant must be eradicated from the land and that land must be kept free of the plant*
Johnson grass	4	Locally Controlled Weed
Sorghum halepense		*The growth of the plant must be managed in a manner that continuously inhibits the ability of the plant to spread and the plant must not be sold, propagated or knowingly distributed*
Karroo thorn	1	State Prohibited Weed
Acacia karroo		*The plant must be eradicated from the land and that land must be kept free of the plant*
Kidney-leaf mud plantain	1	State Prohibited Weed
Heteranthera reniformis		*The plant must be eradicated from the land and that land must be kept free of the plant*
Kochia	1	State Prohibited Weed
Bassia scoparia		*The plant must be eradicated from the land and that land must be kept free of the plant*
Koster's curse	1	State Prohibited Weed
Clidemia hirta		*The plant must be eradicated from the land and that land must be kept free of the plant*
Lagarosiphon	1	State Prohibited Weed
Lagarosiphon major		*The plant must be eradicated from the land and that land must be kept free of the plant*
Leafy elodea	4	Locally Controlled Weed
Egeria densa		*The plant must not be sold, propagated or knowingly distributed*
Lippia	4	Locally Controlled Weed
Phyla canescens		*The plant must not be sold, propagated or knowingly distributed* ***except incidentally in hay or lucerne***
Long-leaf willow primrose	3	Regionally Controlled Weed
Ludwigia longifolia		*The plant must be fully and continuously suppressed and destroyed and the plant must not be sold, propagated or knowingly distributed*
Mesquite	2	Regionally Prohibited Weed
Prosopis species		*The plant must be eradicated from the land and that land must be kept free of the plant*
Mexican feather grass	1	State Prohibited Weed
Nassella tenuissima		*The plant must be eradicated from the land and that land must be kept free of the plant*
Mexican poppy	5	Restricted Plant
Argemone mexicana		*The requirements in the Noxious Weeds Act 1993 for a notifiable weed must be complied with*
Miconia	1	State Prohibited Weed

Miconia species		*The plant must be eradicated from the land and that land must be kept free of the plant*
Mikania vine	1	State Prohibited Weed
Mikania micrantha		*The plant must be eradicated from the land and that land must be kept free of the plant*
Mimosa	1	State Prohibited Weed
Mimosa pigra		*The plant must be eradicated from the land and that land must be kept free of the plant*
Mossman River grass	5	Restricted Plant
Cenchrus echinatus		*The requirements in the Noxious Weeds Act 1993 for a notifiable weed must be complied with*
Mother-of-millions	4	Locally Controlled Weed
Bryophyllum species		*The growth of the plant must be managed in a manner that continuously inhibits the ability of the plant to spread and the plant must not be sold, propagated or knowingly distributed*
Pampas grass	3	Regionally Controlled Weed
Cortaderia species		*The plant must be fully and continuously suppressed and destroyed and the plant must not be sold, propagated or knowingly distributed*
Parkinsonia	2	Regionally Prohibited Weed
Parkinsonia aculeata		*The plant must be eradicated from the land and that land must be kept free of the plant*
Parthenium weed	1	State Prohibited Weed
Parthenium hysterophorus		*The plant must be eradicated from the land and that land must be kept free of the plant*
Pond apple	1	State Prohibited Weed
Annona glabra		*The plant must be eradicated from the land and that land must be kept free of the plant*
Prickly acacia	1	State Prohibited Weed
Acacia nilotica		*The plant must be eradicated from the land and that land must be kept free of the plant*
Prickly pear - common pear	4	Locally Controlled Weed
Opuntia stricta		*The growth of the plant must be managed in a manner that continuously inhibits the ability of the plant to spread and the plant must not be sold, propagated or knowingly distributed*
Prickly pear - Hudson pear	4	Locally Controlled Weed
Cylindropuntia rosea		*The growth of the plant must be managed in a manner that continuously inhibits the ability of the plant to spread and the plant must not be sold, propagated or knowingly distributed*
Prickly pear - smooth tree pear	4	Locally Controlled Weed
Opuntia monacantha		*The growth of the plant must be managed in a manner that continuously inhibits the ability of the plant to spread and the plant must not be sold, propagated or knowingly distributed*
Prickly pear - tiger pear	4	Locally Controlled Weed
Opuntia aurantiaca		*The growth of the plant must be managed in a manner that continuously inhibits the ability of the plant to spread and the plant must not be sold, propagated or knowingly distributed*
Prickly pear - velvety tree pear	4	Locally Controlled Weed
Opuntia tomentosa		*The growth of the plant must be managed in a manner that continuously inhibits the ability of the plant to spread and the plant must not be sold, propagated or knowingly distributed*
Red rice	5	Restricted Plant

Oryza rufipogon		*The requirements in the Noxious Weeds Act 1993 for a notifiable weed must be complied with*
Rhus tree	4	Locally Controlled Weed
Toxicodendron succedaneum		*The growth of the plant must be managed in a manner that continuously inhibits the ability of the plant to spread and the plant must not be sold, propagated or knowingly distributed*
Rubber vine	1	State Prohibited Weed
Cryptostegia grandiflora		*The plant must be eradicated from the land and that land must be kept free of the plant*
Sagittaria	4	Locally Controlled Weed
Sagittaria platyphylla		*The plant must not be sold, propagated or knowingly distributed*
Salvinia	2	Regionally Prohibited Weed
Salvinia molesta		*The plant must be eradicated from the land and that land must be kept free of the plant*
Scotch broom	4	Locally Controlled Weed
Cytisus scoparius		*The plant must not be sold, propagated or knowingly distributed*
Senegal tea plant	1	State Prohibited Weed
Gymnocoronis spilanthoides		*The plant must be eradicated from the land and that land must be kept free of the plant*
Serrated tussock	4	Locally Controlled Weed
Nassella trichotoma		*The growth of the plant must be managed in a manner that continuously inhibits the ability of the plant to spread and the plant must not be sold, propagated or knowingly distributed*
Siam weed	1	State Prohibited Weed
Chromolaena odorata		*The plant must be eradicated from the land and that land must be kept free of the plant*
Silk forage sorghum	4	Locally Controlled Weed
Sorghum species hybrid cultivar "Silk"		*The growth of the plant must be managed in a manner that continuously inhibits the ability of the plant to spread*
Silverleaf nightshade	4	Locally Controlled Weed
Solanum elaeagnifolium		*The growth of the plant must be managed in a manner that continuously inhibits the ability of the plant to spread and the plant must not be sold, propagated or knowingly distributed*
Smooth-stemmed turnip	5	Restricted Plant
Brassica barrelieri subsp. *oxyrrhina*		*The requirements in the Noxious Weeds Act 1993 for a notifiable weed must be complied with*
Soldier thistle	5	Restricted Plant
Picnomon acarna		*The requirements in the Noxious Weeds Act 1993 for a notifiable weed must be complied with*
Spongeplant	1	State Prohibited Weed
Limnobium spongia		*The plant must be eradicated from the land and that land must be kept free of the plant*
Spotted knapweed	1	State Prohibited Weed
Centaurea stoebe subsp. *micranthos*		*The plant must be eradicated from the land and that land must be kept free of the plant*
Texas blueweed	5	Restricted Plant
Helianthus ciliaris		*The requirements in the Noxious Weeds Act 1993 for a notifiable weed must be complied with*
Tree-of-heaven	4	Locally Controlled Weed
Ailanthus altissima		*The growth of the plant must be managed in a manner that continuously inhibits the ability of the plant to spread and the plant must not be sold, propagated or knowingly distributed*
Tropical soda apple	1	State Prohibited Weed

Solanum viarum		*The plant must be eradicated from the land and that land must be kept free of the plant*
Water caltrop	1	State Prohibited Weed
Trapa species		*The plant must be eradicated from the land and that land must be kept free of the plant*
Water hyacinth	2	Regionally Prohibited Weed
Eichhornia crassipes		*The plant must be eradicated from the land and that land must be kept free of the plant*
Water lettuce	1	State Prohibited Weed
Pistia stratiotes		*The plant must be eradicated from the land and that land must be kept free of the plant*
Water soldier	1	State Prohibited Weed
Stratiotes aloides		*The plant must be eradicated from the land and that land must be kept free of the plant*
Willows	4	Locally Controlled Weed
Salix species		*The plant must not be sold, propagated or knowingly distributed*
Witchweeds	1	State Prohibited Weed
Striga species		*The plant must be eradicated from the land and that land must be kept free of the plant*
Yellow burrhead	1	State Prohibited Weed
Limnocharis flava		*The plant must be eradicated from the land and that land must be kept free of the plant*
Yellow nutgrass	5	Restricted Plant
Cyperus esculentus		*The requirements in the Noxious Weeds Act 1993 for a notifiable weed must be complied with*

APPENDIX 3: ASSESSMENT OF LIKELIHOOD OF THREATENED SPECIES, COMMUNITIES AND POPULATIONS

Common Name	Scientific Name	Habitat and Ecology (OEH Species Profile and /or EPBC SPRAT Profile)	TSC Act Status	EPBC Act Status	OEH Threatened Species Search	DSEWPaC Protected Matters Search	Potential to occur
Australasian Bittern	*Botaurus poiciloptilus*	Favours permanent freshwater wetlands with tall, dense vegetation, particularly bullrushes (Typha spp.) and spikerushes (Eleoacharis spp.). Hides during the day amongst dense reeds or rushes and feed mainly at night on frogs, fish, yabbies, spiders, insects and snails. Feeding platforms may be constructed over deeper water from reeds trampled by the bird; platforms are often littered with prey remains. Breeding occurs in summer from October to January; nests are built in secluded places in densely-vegetated wetlands on a platform of reeds; there are usually six olive-brown eggs to a clutch.	Endangered	Endangered	Known	Species or species habitat may occur within Area	Unlikely
Ausfeld's Wattle	Acacia ausfeldii	Found to the east of Dubbo in the Mudgee-Ulan-Gulgong area of the NSW South Western Slopes bioregion, with some records in the adjoining Brigalow Belt South, South Eastern Highlands and the Sydney Basin bioregions. Populations are recorded from Yarrobil National Park, Goodiman State Conservation Area and there is a 1963 record from Munghorn Gap Nature Reserve. A large population is also known from Tuckland State Forest to the northwest of Gulgong. Established plants are likely to be killed by fire, as mature and juvenile plants have a single-stemmed growth form. Associated species include Eucalyptus albens, E. blakelyi and Callitris spp., with an understorey dominated by Cassinia spp. and grasses.	Vulnerable		Known		Potential
Bilby	Macrotis lagotis	Once widespread in arid, semi-arid and relatively fertile areas, the Bilby is now restricted to arid regions and remains a threatened species. The Bilby prefers arid habitats because of the spinifex grass and acacia shrub.	Presumed extinct	Vulnerable			No
Barking Owl	*Ninox connivens*	Nesting occurs during mid-winter and spring. Female incubates for 5 weeks, roosts outside the hollow when chicks are 4 weeks old, then fledging starts 2 weeks later. Young are dependent for several months Territorial pairs respond strongly to recordings of Barking Owl calls from up to 6 kilometres away, though humans rarely hear this response farther than 1.5 kilometres. Because disturbance reduces the pair's foraging time, and can pull the female off her eggs even on cold nights, recordings should not be broadcast unnecessarily nor during the nesting season.	Vulnerable		Known		Likely. Pair known to occupy territory adjacent to the Macquarie River. Hunting ground may exist in the Subject Site. Hollow bearing trees adjacent to a permanent watercourse (breeding habitat) does not occur in the Subject Site.

Common Name	Scientific Name	Habitat and Ecology (OEH Species Profile and /or EPBC SPRAT Profile)	TSC Act Status	EPBC Act Status	OEH Threatened Species Search	DSEWPaC Protected Matters Search	Potential to occur
Black Falcon	Falco subniger	The Black Falcon is widely, but sparsely, distributed in New South Wales, mostly occurring in inland regions. Some reports of 'Black Falcons' on the tablelands and coast of New South Wales are likely to be referable to the Brown Falcon. In New South Wales there is assumed to be a single population that is continuous with a broader continental population, given that falcons are highly mobile, commonly travelling hundreds of kilometres (Marchant & Higgins 1993). The Black Falcon occurs as solitary individuals, in pairs, or in family groups of parents and offspring.	Vulnerable		Known		Potential
Black-breasted Buzzard	*Hamirostra melanosternon*	Lives in a range of inland habitats, especially along timbered watercourses which is the preferred breeding habitat. Also hunts over grasslands and sparsely timbered woodlands. Not a powerful hunter, despite its size, mostly taking reptiles, small mammals, birds, including nestlings, and carrion. Also specialises in feeding on large eggs, including those of emus, which it cracks on a rock. Breeds from August to October near water in a tall tree. The stick nest is large and flat and lined with green leaves. Normally two eggs are laid.	Vulnerable		Predicted		Potential. Hunting ground may exist in the Subject Site, however tall trees near water (breeding habitat) do not occur in the Subject Site.
Black-chinned Honeyeater (eastern subspecies)	*Melithreptus gularis gularis*	Occupies mostly upper levels of drier open forests or woodlands dominated by box and ironbark eucalypts, especially Mugga Ironbark (*Eucalyptus sideroxylon*), White Box (*E. albens*), Inland Grey Box (*E. microcarpa*), Yellow Box (*E. melliodora*) and Forest Red Gum (*E. tereticornis*). Also inhabits open forests of smooth-barked gums, stringybarks, ironbarks and tea-trees. A gregarious species usually seen in pairs and small groups of up to 12 birds. Feeding territories are large making the species locally nomadic. Recent studies have found that the Black-chinned Honeyeater tends to occur in the largest woodland patches in the landscape as birds forage over large home ranges of at least 5 hectares Breeds solitarily or co-operatively, with up to five or six adults, from June to December. The nest is placed high in the crown of a tree, in the uppermost lateral branches, hidden by foliage. It is a compact, suspended, cup-shaped nest. Two or three eggs are laid and both parents and occasionally helpers feed the young.	Vulnerable		Known		Potential.
Black-necked Stork	*Ephippiorhynchus asiaticus*	Black-necked Storks are mainly found on shallow, permanent, freshwater terrestrial wetlands, and surrounding marginal vegetation, including swamps, floodplains, watercourses and	Endangered		Predicted		Unlikely. Wetland habitat suitable for this species

Common Name	Scientific Name	Habitat and Ecology (OEH Species Profile and /or EPBC SPRAT Profile)	TSC Act Status	EPBC Act Status	OEH Threatened Species Search	DSEWPaC Protected Matters Search	Potential to occur
		billabongs, freshwater meadows, wet heathland, farm dams and shallow floodwaters, as well as extending into adjacent grasslands, paddocks and open savannah woodlands. They also forage within or around estuaries and along intertidal shorelines, such as saltmarshes, mudflats and sandflats, and mangrove vegetation. In NSW, Black-necked Storks breed in late spring and summer. Breeding activity has been recorded in most months, with activities from nest construction to fledging of young recorded from May to January. Most activity, however, takes place between June and December, and clutches present May to September. In NSW, Storks usually nest in a tall, live and isolated paddock tree, but also in other trees, including paperbarks, or even lower shrubs within wetlands. The nest is a large platform, 1-2 metres in diameter, made in a live or dead tree, in or near a freshwater swamp. The clutch-size of nests in NSW is not properly known, but nests have been observed with from one to three young in the nest. Broods of four young have been recorded in northern Queensland.					does not occur in the Subject Site.
Black-tailed Godwit	*Limosa limosa*	Primarily a coastal species. Usually found in sheltered bays, estuaries and lagoons with large intertidal mudflats and/or sandflats. Further inland, it can also be found on mudflats and in water less than 10 cm deep, around muddy lakes and swamps. Individuals have been recorded in wet fields and sewerage treatment works. Forages for insects, crustaceans, molluscs, worms, larvae, spiders, fish eggs, frog eggs and tadpoles in soft mud or shallow water. Roosts and loafs on low banks of mud, sand and shell bars. Frequently recorded in mixed flocks with Bar-tailed Godwits.	Vulnerable		Predicted		Unlikely. Suitable habitat for this species does not occur in the Subject Site.
Blue-billed Duck	*Oxyura australis*	The Blue-billed Duck prefers deep water in large permanent wetlands and swamps with dense aquatic vegetation. The species is completely aquatic, swimming low in the water along the edge of dense cover. It will fly if disturbed, but prefers to dive if approached. Blue-billed Ducks will feed by day far from the shore, particularly if dense cover is available in the central parts of the wetland. They feed on the bottom of swamps eating seeds, buds, stems, leaves, fruit and small aquatic insects such as the larvae of midges, caddisflies and dragonflies. Blue-billed Ducks are partly migratory, with short-distance movements between breeding swamps and overwintering lakes	Vulnerable		Known		Unlikely. Suitable habitat for this species does not occur in the Subject Site.

Common Name	Scientific Name	Habitat and Ecology (OEH Species Profile and /or EPBC SPRAT Profile)	TSC Act Status	EPBC Act Status	OEH Threatened Species Search	DSEWPaC Protected Matters Search	Potential to occur
		with some long-distance dispersal to breed during spring and early summer. Blue-billed Ducks usually nest solitarily in Cumbungi over deep water between September and February. They will also nest in trampled vegetation in Lignum, sedges or Spike-rushes, where a bowl-shaped nest is constructed. The most common clutch size is five or six. Males take no part in nest-building or incubation. Young birds disperse in April-May from their breeding swamps in inland NSW to non-breeding areas on the Murray River system and coastal lakes.					
Brolga	*Grus rubicunda*	Though Brolgas often feed in dry grassland or ploughed paddocks or even desert claypans, they are dependent on wetlands too, especially shallow swamps, where they will forage with their head entirely submerged. They feed using their heavy straight bill as a 'crowbar' to probe the ground or turn it over, primarily on sedge roots and tubers. They will also take large insects, crustaceans, molluscs and frogs. The nest comprises a platform of grasses and sticks, augmented with mud, on an island or in the water. Two eggs are laid from winter to autumn.	Vulnerable		Known		Unlikely. Suitable habitat for this species does not occur in the Subject Site.
Brown Treecreeper (eastern subspecies)	*Climacteris picumnus victoriae*	Found in eucalypt woodlands (including Box-Gum Woodland) and dry open forest of the inland slopes and plains inland of the Great Dividing Range; mainly inhabits woodlands dominated by stringybarks or other rough-barked eucalypts, usually with an open grassy understorey, sometimes with one or more shrub species; also found in mallee and River Red Gum (*Eucalyptus camaldulensis*) Forest bordering wetlands with an open understorey of acacias, saltbush, lignum, cumbungi and grasses; usually not found in woodlands with a dense shrub layer; fallen timber is an important habitat component for foraging; also recorded, though less commonly, in similar woodland habitats on the coastal ranges and plains. Sedentary, considered to be resident in many locations throughout its range; present in all seasons or year-round at many sites; territorial year-round, though some birds may disperse locally after breeding. Gregarious and usually observed in pairs or small groups of eight to 12 birds; terrestrial and arboreal in about equal proportions; active, noisy and conspicuous while foraging on trunks and branches of trees and amongst fallen timber; spend much more time foraging on the ground and fallen logs than other treecreepers.	Vulnerable		Known		Likely

Common Name	Scientific Name	Habitat and Ecology (OEH Species Profile and /or EPBC SPRAT Profile)	TSC Act Status	EPBC Act Status	OEH Threatened Species Search	DSEWPaC Protected Matters Search	Potential to occur
		When foraging in trees and on the ground, they peck and probe for insects, mostly ants, amongst the litter, tussocks and fallen timber, and along trunks and lateral branches; up to 80% of the diet is comprised of ants; other invertebrates (including spiders, insects larvae, moths, beetles, flies, hemipteran bugs, cockroaches, termites and lacewings) make up the remaining percentage; nectar from Mugga Ironbark (*Eucalyptus sideroxylon*) and paperbarks, and sap from an unidentified eucalypt are also eaten, along with lizards and food scraps; young birds are fed ants, insect larvae, moths, craneflies, spiders and butterfly and moth larvae. Hollows in standing dead or live trees and tree stumps are essential for nesting. The species breeds in pairs or co-operatively in territories which range in size from 1.1 to 10.7 ha (mean = 4.4 ha). Each group is composed of a breeding pair with retained male offspring and, rarely, retained female offspring. Often in pairs or cooperatively breeding groups of two to five birds.					
Bush Stone-curlew	*Burhinus grallarius*	Inhabits open forests and woodlands with a sparse grassy groundlayer and fallen timber. Largely nocturnal, being especially active on moonlit nights. Feed on insects and small vertebrates, such as frogs, lizards and snakes. Nest on the ground in a scrape or small bare patch. Two eggs are laid in spring and early summer.	Endangered		Known		Unlikely.
Cattle Egret	Ardea ibis	The Cattle Egret is widespread and common according to migration movements and breeding localities surveys. Two major distributions have been located; from north-east Western Australia to the Top End of the Northern Territory and around south-east Australia. The Cattle Egret breeds in coastal areas.		Migratory > Listed		Species or species habitat may occur within area	Potential.
Curlew Sandpiper	Calidris (Erolia) ferruginea	In Australia, Curlew Sandpipers occur around the coasts and are also quite widespread inland, though in smaller numbers. Records occur in all states during the non-breeding period, and also during the breeding season when many non-breeding one year old birds remain in Australia rather than migrating north. They are occasionally recorded in the Tablelands and are widespread in the Riverina and south-west NSW, with scattered records elsewhere. Curlew Sandpipers forage on mudflats and nearby shallow water.	Endangered	Migratory > Marine> Listed			Unlikely. Previously recorded in 10km radius however suitable habitat for this species does not occur in the Subject Site.
Diamond Firetail	*Stagonopleura guttata*	Usually encountered in flocks of between five to 40 birds, occasionally more. Found in grassy eucalypt woodlands, including Box-Gum Woodlands and Snow Gum *Eucalyptus pauciflora* Woodlands.	Vulnerable		Known		Likely. Habitat within the Subject Site may be suitable for this species. Requires

Common Name	Scientific Name	Habitat and Ecology (OEH Species Profile and /or EPBC SPRAT Profile)	TSC Act Status	EPBC Act Status	OEH Threatened Species Search	DSEWPaC Protected Matters Search	Potential to occur
		Also occurs in open forest, mallee, Natural Temperate Grassland, and in secondary grassland derived from other communities. Often found in riparian areas (rivers and creeks), and sometimes in lightly wooded farmland. Feeds exclusively on the ground, on ripe and partly-ripe grass and herb seeds and green leaves, and on insects (especially in the breeding season). Groups separate into small colonies to breed, between August and January. Nests are globular structures built either in the shrubby understorey, or higher up, especially under hawk's or raven's nests. Birds roost in dense shrubs or in smaller nests built especially for roosting. Appears to be sedentary, though some populations move locally, especially those in the south. Has been recorded in some towns and near farm houses.					shrubby understorey.
Eastern Pygmy-possum	Cercartetus nanus	The Eastern Pygmy-possum is found in south-eastern Australia, from southern Queensland to eastern South Australia and in Tasmania. In NSW it extends from the coast inland as far as the Pilliga, Dubbo, Parkes and Wagga Wagga on the western slopes. Found in a broad range of habitats from rainforest through sclerophyll (including Box-Ironbark) forest and woodland to heath, but in most areas woodlands and heath appear to be preferred, except in north-eastern NSW where they are most frequently encountered in rainforest. Feeds largely on nectar and pollen collected from banksias, eucalypts and bottlebrushes; an important pollinator of heathland plants such as banksias; soft fruits are eaten when flowers are unavailable. Shelters in tree hollows, rotten stumps, holes in the ground, abandoned bird-nests, Ringtail Possum (Pseudocheirus peregrinus) dreys or thickets of vegetation, (e.g. grass-tree skirts); nest-building appears to be restricted to breeding females; tree hollows are favoured but spherical nests have been found under the bark of eucalypts and in shredded bark in tree forks.	Vulnerable		Predicted		Unlikely.
Fork-tailed Swift	Apus pacificus	The Fork-tailed Swift is a non-breeding visitor to all states and territories of Australia (Higgins 1999). In NSW, the Fork-tailed Swift is recorded in all regions. Many records occur east of the Great Divide, however, a few populations have been found west of the Great Divide. These are widespread but scattered further west of		Migratory > Listed		Species or species habitat may occur within area	Potential. Suitable habitat for this species does not occur in the Subject Site.

Common Name	Scientific Name	Habitat and Ecology (OEH Species Profile and /or EPBC SPRAT Profile)	TSC Act Status	EPBC Act Status	OEH Threatened Species Search	DSEWPaC Protected Matters Search	Potential to occur
		the line joining Bourke and Dareton. Sightings have been recorded at Milparinka, the Bulloo River and Thurloo Downs (Higgins 1999).					
Flame Robin	*Petroica phoenicea*	Breeds in upland tall moist eucalypt forests and woodlands, often on ridges and slopes. Prefers clearings or areas with open understoreys. The groundlayer of the breeding habitat is dominated by native grasses and the shrub layer may be either sparse or dense. Occasionally occurs in temperate rainforest, and also in herbfields, heathlands, shrublands and sedgelands at high altitudes. In winter, birds migrate to drier more open habitats in the lowlands (ie valleys below the ranges, and to the western slopes and plains). Often occurs in recently burnt areas; however, habitat becomes unsuitable as vegetation closes up following regeneration. In winter lives in dry forests, open woodlands and in pastures and native grasslands, with or without scattered trees. In winter, occasionally seen in heathland or other shrublands in coastal areas. Birds forage from low perches, from which they sally or pounce onto small invertebrates which they take from the ground or off tree trunks, logs and other coarse woody debris. Flying insects are often taken in the air and sometimes gleans for invertebrates from foliage and bark. In their autumn and winter habitats, birds often sally from fence-posts or thistles and other prominent perches in open habitats. Occur singly, in pairs, or in flocks of up to 40 birds or more; in the non-breeding season they will join up with other insectivorous birds in mixed feeding flocks. Breeds in spring to late summer. Nests are often near the ground and are built in sheltered sites, such as shallow cavities in trees, stumps or banks. Builds an open cup nest made of plant materials and spider webs. Eggs are oval in shape and are pale bluish- or greenish-white and marked with brownish blotches; clutch size is three or four eggs.	Vulnerable		Known		Potential. Habitat within the Subject Site may be suitable for this species. Requires shrubby understorey.
Freckled Duck	*Stictonetta naevosa*	Prefer permanent freshwater swamps and creeks with heavy growth of Cumbungi, Lignum or Tea-tree. During drier times they move from ephemeral breeding swamps to more permanent waters such as lakes, reservoirs, farm dams and sewage ponds. Generally rest in dense cover during the day, usually in deep water. Feed at dawn and dusk and at night on algae, seeds and	Vulnerable		Predicted		Unlikely. Suitable habitat for this species does not occur in the Subject Site.

Common Name	Scientific Name	Habitat and Ecology (OEH Species Profile and /or EPBC SPRAT Profile)	TSC Act Status	EPBC Act Status	OEH Threatened Species Search	DSEWPaC Protected Matters Search	Potential to occur
		vegetative parts of aquatic grasses and sedges and small invertebrates. Nesting usually occurs between October and December but can take place at other times when conditions are favourable. Nests are usually located in dense vegetation at or near water level.					
Fuzzy Box Woodland on alluvial Soils of the South Western Slopes, Darling Riverine Plains and Brigalow Belt South Bioregions	Fuzzy Box Woodland on alluvial Soils of the South Western Slopes, Darling Riverine Plains and Brigalow Belt South Bioregions	Community occurs on brown loam or clay, alluvial or colluvial soils on prior streams and abandoned channels or slight depressions on undulating plains or flats of the western slopes. Community often occurs upslope from River Red Gum communities above frequently inundated areas of the floodplain. It also occurs on colluvium soils on lower slopes and valley flats. Less than 5% of the original extent is estimated to remain. Shrubs include Wilga, Deane's Wattle, Hop Bush, Cassia, Water Bush and Sifton Bush.	Endangered Ecological Community		Known		Yes. Known to occur in Subject Site.
Golden Sun Moth	Synemon plana	The Golden Sun Moth's NSW populations are found in the area between Queanbeyan, Gunning, Young and Tumut. The species' historical distribution extended from Bathurst (central NSW) through the NSW Southern Tablelands, through to central and western Victoria, to Bordertown in eastern South Australia. Occurs in Natural Temperate Grasslands and grassy Box-Gum Woodlands in which groundlayer is dominated by wallaby grasses Austrodanthonia spp. Grasslands dominated by wallaby grasses are typically low and open - the bare ground between the tussocks is thought to be an important microhabitat feature for the Golden Sun Moth, as it is typically these areas on which the females are observed displaying to attract males.	Endangered	Critically Endangered			No. One previous record in proximity to the Subject Site is likely to be incorrect. No suitable habitat for this species occurs in the Subject Site.
Gilbert's Whistler	*Pachycephala inornata*	The Gilbert's Whistler occurs in a range of habitats within NSW, though the shared feature appears to be a dense shrub layer. It is widely recorded in mallee shrublands, but also occurs in box-ironbark woodlands, Cypress Pine and Belah woodlands and River Red Gum forests. Though at this stage it is only known to use this habitat along the Murray, Edwards and Wakool Rivers. Within the mallee the species is often found in association with an understorey of spinifex and low shrubs including wattles, hakeas, sennas and hop-bushes. In woodland habitats, the understorey comprises dense patches of shrubs, particularly thickets of regrowth *Callitris* pine. Parasitic 'cherries' (*Exocarpus* species)	Vulnerable		Known		Unlikely.

Common Name	Scientific Name	Habitat and Ecology (OEH Species Profile and /or EPBC SPRAT Profile)	TSC Act Status	EPBC Act Status	OEH Threatened Species Search	DSEWPaC Protected Matters Search	Potential to occur
		appear to be an important habitat component in Belah and Red Gum communities, though in the latter case other dense shrubs, such as Lignum and wattles, are also utilised. The Gilbert's Whistler forages on or near the ground in shrub thickets and in tops of small trees. Its food consists mainly of spiders and insects such as caterpillars, beetles and ants, and occasionally, seeds and fruits are eaten. The movements of this species are poorly known but it is believed that generally it does not make any regular large-scale movements and pairs may hold and defend territories all year round.					
Great Egret, White Egret	Ardea alba	Great Egrets prefer shallow water, particularly when flowing, but may be seen on any watered area, including damp grasslands. Great Egrets can be seen alone or in small flocks, often with other egret species, and roost at night in groups. The Great Egret usually feeds alone. It feeds on molluscs, amphibians, aquatic insects, small reptiles, crustaceans and occasionally other small animals, but fish make up the bulk of its diet. The Great Egret usually hunts in water, wading through the shallows, or standing motionless before stabbing at prey. Birds have also been seen taking prey while in flight.		Migratory > Listed		Species or species habitat likely to occur within area	Potential
Glossy Black-cockatoo	*Calyptorhynchus lathami*	Inhabits open forest and woodlands of the coast and the Great Dividing Range up to 1000 metres in which stands of she-oak species, particularly Black She-oak (*Allocasuarina littoralis*), Forest She-oak (*A. torulosa*) or Drooping She-oak (*A. verticillata*) occur. In the Riverina area, again usually associated with woodlands containing Drooping She-oak but also recorded in open woodlands dominated by Belah (Casuarina cristata). Feeds almost exclusively on the seeds of several species of she-oak (Casuarina and Allocasuarina species), shredding the cones with the massive bill. Dependent on large hollow-bearing eucalypts for nest sites. One or two eggs are laid between March and August.	Vulnerable	Endangered (Only South-Australian Sub-species).	Known		Potential. Goonoo SCA is a stronghold for this species.
Greater Long-eared Bat	*Nyctophilus timoriensis/corbeni (South-eastern form)*	The South-eastern Long-eared Bat occurs in a range of inland woodland vegetation types, including box, ironbark and cypress pine woodlands. The species also occurs in Bulloke woodland, Brigalow woodland, Belah woodland, Smooth-barked Apple, *Angophora leiocarpa,* woodland; River Red Gum, *Eucalyptus camaldulensis,* forests lining watercourses and lakes, Black Box, *Eucalyptus largiflorens,* woodland, dry sclerophyll forest.	Vulnerable	Endangered	Predicted	Species or species habitat may occur within Area	Potential. Some trees with small hollows or decorating bark in the Subject Site.

Common Name	Scientific Name	Habitat and Ecology (OEH Species Profile and /or EPBC SPRAT Profile)	TSC Act Status	EPBC Act Status	OEH Threatened Species Search	DSEWPaC Protected Matters Search	Potential to occur
Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions/Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia		Inland Grey Box Woodland occurs on fertile soils of the western slopes and plains of NSW. The community generally occurs where average rainfall is 375- 800 mm pa and the mean maximum annual temperature is 22- 26°C. There is a correlation between the distribution of *Eucalyptus microcarpa* communities and soils of Tertiary and Quaternary alluvial origin, largely corresponding with the Red Brown Earths. The majority of remnant patches of Inland Grey Box Woodland survive with trees largely intact but with the shrub or ground layers degraded to varying degrees through grazing or pasture modification. Some species that are part of the community appear intolerant to heavy grazing by domestic stock and are confined to the least disturbed remnants.	Endangered Ecological Community	Endangered	Known	Community may occur within area	Yes. Known to occur in the Subject Site on undulating land and footslopes
Grey Falcon	*Falco hypoleucos*	Usually restricted to shrubland, grassland and wooded watercourses of arid and semi-arid regions, although it is occasionally found in open woodlands near the coast. Also occurs near wetlands where surface water attracts prey. Preys primarily on birds, especially parrots and pigeons, using high-speed chases and stoops; reptiles and mammals are also taken. Like other falcons it utilises old nests of other birds of prey and ravens, usually high in a living eucalypt near water or a watercourse; peak laying season is in late winter and early spring; two or three eggs are laid.	Endangered		Known		Potential to have hunting areas within the Subject Site.
Grey-crowned Babbler (eastern subspecies)	*Pomatostomus temporalis temporalis*	Inhabits open Box-Gum Woodlands on the slopes, and Box-Cypress-pine and open Box Woodlands on alluvial plains. Flight is laborious so birds prefer to hop to the top of a tree and glide down to the next one. Birds are generally unable to cross large open areas. Live in family groups that consist of a breeding pair and young from previous breeding seasons. A group may consist of up to fifteen birds. All members of the family group remain close to each other when foraging. A soft 'chuck' call is made by all birds as a way of keeping in contact with other group members.	Vulnerable		Known		Yes. Known. Suitable habitat for this species is known to occur in the Subject Site

Common Name	Scientific Name	Habitat and Ecology (OEH Species Profile and /or EPBC SPRAT Profile)	TSC Act Status	EPBC Act Status	OEH Threatened Species Search	DSEWPaC Protected Matters Search	Potential to occur
		Feed on invertebrates, either by foraging on the trunks and branches of eucalypts and other woodland trees or on the ground, digging and probing amongst litter and tussock grasses Build and maintain several conspicuous, dome-shaped stick nests about the size of a football. A nest is used as a dormitory for roosting each night. Nests are usually located in shrubs or sapling eucalypts, although they may be built in the outermost leaves of low branches of large eucalypts. Nests are maintained year round, and old nests are often dismantled to build new ones. Breed between July and February. Usually two to three eggs are laid and incubated by the female. During incubation, the adult male and several helpers in the group may feed the female as she sits on the nest. Young birds are fed by all other members of the group. Territories range from one to fifty hectares (usually around ten hectares) and are defended all year. Territorial disputes with neighbouring groups are frequent and may last up to several hours, with much calling, chasing and occasional fighting.					
Homoranthus darwinioides	*Homoranthus darwinioides*	Rare in the central tablelands and western slopes of NSW, occurring from Putty to the Dubbo district. It is found west of Muswellbrook between Merriwa and Bylong, and north of Muswellbrook to Goonoo SF. The species has been collected from Lee's Pinch, but not relocated at its original locality north of Mt Coricudgy above the headwaters of Widden Brook. Goonoo SF is established as a definite locality. Grows in in various woodland habitats with shrubby understoreys, usually in gravely sandy soils. Landforms the species has been recorded growing on include flat sunny ridge tops with scrubby woodland, sloping ridges, gentle south-facing slopes, and a slight depression on a roadside with loamy sand. Associated species include Callitris endlicheri, Eucalyptus crebra, E. fibrosa, E. trachyphloia, E. beyeri subsp. illaquens, E. dwyeri, E. rossii, Leptospermum divaricatum, Melaleuca uncinata, Calytrix tetragona, Allocasuarina spp. and Micromyrtus spp. Flowers in spring or from March to December. The species has been cultivated in Sydney from Rylstone cuttings and at Burrendong Arboretum near Wellington. Forms small shrubs or shrublets, often in tangled masses. It has a localised distribution and may be the dominant undershrub at some sites. Its abundance in populations ranges from rare (only one plant at site) to very locally abundant.	Vulnerable	Vulnerable	Known		Potential to occur in the Subject Site. Known to occur in Goonoo SCA.
Lathams Snipe	Gallinago hardwickii	Latham's Snipe is a non-breeding visitor to south-eastern Australia. The distribution of Latham's Snipe is naturally		Listed		Species or species	Unlikely. Suitable habitat for this

Common Name	Scientific Name	Habitat and Ecology (OEH Species Profile and /or EPBC SPRAT Profile)	TSC Act Status	EPBC Act Status	OEH Threatened Species Search	DSEWPaC Protected Matters Search	Potential to occur
		fragmented (although, because of the mobility of the species, this is unlikely to have any effect on survival). The distribution is fragmented because the preferred habitat (ie freshwater wetlands) occurs in patches throughout the non-breeding grounds (Weston 2006, pers. comm.).				habitat may occur within area	species does not occur in the Subject Site.
Hooded Robin (south-eastern form)	*Melanodryas cucullata cucullata*	Prefers lightly wooded country, usually open eucalypt woodland, acacia scrub and mallee, often in or near clearings or open areas. Requires structurally diverse habitats featuring mature eucalypts, saplings, some small shrubs and a ground layer of moderately tall native grasses. Often perches on low dead stumps and fallen timber or on low-hanging branches, using a perch-and-pounce method of hunting insect prey. Territories range from around 10 ha during the breeding season, to 30 ha in the non-breeding season. May breed any time between July and November, often rearing several broods. The nest is a small, neat cup of bark and grasses bound with webs, in a tree fork or crevice, from less than 1 metre to 5 metres above the ground. The nest is defended by both sexes with displays of injury-feigning, tumbling across the ground. A clutch of two to three is laid and incubated for fourteen days by the female. Two females often cooperate in brooding.	Vulnerable		Known		Unlikely
Keith's Zieria		Grows in dry sclerophyll forest on light sandy soils. All known populations have been recorded in Eucalyptus-Callitris woodland or open forest with a shrubby to heathy understorey. Mostly from gentle slopes in red-brown and yellow-brown sandy loams, often with a rocky surface. Associated and understorey species include Eucalyptus crebra, Eucalyptus fibrosa, Eucalyptus dwyeri, Eucalyptus beyeriana, Eucalyptus microcarpa, Callitris endlicheri, Allocasuarina diminuta, Allocasuarina distyla, Allocasuarina verticillata, Leptospermum divaricatum, Leptospermum parvifolium, Acacia triptera, Acacia gladiiformis, Acacia brownii, Grevillea floribunda, Grevillea triternata, Hakea decurrens, Boronia glabra, Philotheca salsolifolia, Leucopogon attenuatus, Melaleuca uncinata, Melaleuca erubescens, Kunzea parvifolia, Calytrix tetragona, Brachyloma daphnoides, Melichrus urceolatus, Cassinia aculeata, Dodonaea viscosa subsp. spatulata, Dodonaea peduncularis, Dodonaea heteromorpha, Dillwynia sericea, Hibbertia riparia, Dampiera	Endangered	Endangered	Known		Unlikely.

Common Name	Scientific Name	Habitat and Ecology (OEH Species Profile and /or EPBC SPRAT Profile)	TSC Act Status	EPBC Act Status	OEH Threatened Species Search	DSEWPaC Protected Matters Search	Potential to occur
		lanceolata, Dianella longifolia, Prostanthera species and Goodenia species. Flowering time is in spring and plants bear fruit in summer. Plants can produce flowers and fruits any time between July and March. Grows only in small localised populations within the north-east and central areas of Goonoo State Forest. Population sizes vary from 6 to 80 individuals. The age structure within populations may be even and single-aged or uneven and multi-aged.					
Koala	*Phascolarctos cinereus*	Inhabit eucalypt woodlands and forests. Feed on the foliage of more than 70 eucalypt species and 30 non-eucalypt species, but in any one area will select preferred browse species. Inactive for most of the day, feeding and moving mostly at night. Spend most of their time in trees, but will descend and traverse open ground to move between trees. Home range size varies with quality of habitat, ranging from less than two ha to several hundred hectares in size. Generally solitary, but have complex social hierarchies based on a dominant male with a territory overlapping several females and sub-ordinate males on the periphery. Females breed at two years of age and produce one young per year.	Vulnerable		Known	Species or species Known to occur within Area	Potential
Leafless Indigo	Indigofera efoliata	Indigofera efoliata occurs in the central western slopes of NSW, from Dubbo to Geurie (Ayres et al., 1996). In August 1955, the species was recorded along the Dubbo to Minore railway line and road, on Wallaringa and Geurie properties and in Goonoo State Forest (DECC, 2005). Forty eight sites were searched in November 1997, but no plants were found. There are only two early records that contain precise locality details, both of which have been either heavily grazed or cleared of native vegetation, with one site now supporting a dense cover of weeds (Mackay & Gross, 1998). The species is very rare and considered to be possibly extinct (DECC, 2005). The species occurs within the Central West (NSW) Natural Resource Management Regions (DECC, 2005). Indigofera efoliata prefers stony ground in red-brown sandy loam on a slight rise, among ironstone formation (Harden, 1991; Ayres et al., 1996; Mackay & Gross, 1998). It appears to inhabit Yellow-box (Eucalyptus melliodora) woodland (Mackay & Gross, 1998), E. crebra–Callitris glaucophylla dry sclerophyll forest and E. microcarpa–Callitris glaucophylla tall woodland (DECC, 2005). The	Endangered	Endangered	Known		Unlikely.

Common Name	Scientific Name	Habitat and Ecology (OEH Species Profile and /or EPBC SPRAT Profile)	TSC Act Status	EPBC Act Status	OEH Threatened Species Search	DSEWPaC Protected Matters Search	Potential to occur
		average annual rainfall where the species has been recorded is between 475 and 600 mm (Mackay & Gross, 1998).					
Large-eared Pied Bat	*Chalinolobus dwyeri*	Found mainly in areas with extensive cliffs and caves, from Rockhampton in Queensland south to Bungonia in the NSW Southern Highlands. It is generally rare with a very patchy distribution in NSW. There are scattered records from the New England Tablelands and North West Slopes.	Vulnerable	Vulnerable	Predicted	Species or species habitat may occur within Area	Unlikely
Little Eagle	*Hieraaetus morphnoides*	Occupies open eucalypt forest, woodland or open woodland. Sheoak or acacia woodlands and riparian woodlands of interior NSW are also used. Nests in tall living trees within a remnant patch, where pairs build a large stick nest in winter. Lays two or three eggs during spring, and young fledge in early summer. Preys on birds, reptiles and mammals, occasionally adding large insects and carrion.	Vulnerable		Known		Potential have hunting grounds in the Subject Site
Little Lorikeet	Glossopsitta pusilla	Feeds mostly on nectar and pollen, occasionally on native fruits such as mistletoe, and only rarely in orchards Gregarious, travelling and feeding in small flocks (<10), though often with other lorikeets. Flocks numbering hundreds are still occasionally observed and may have been the norm in past centuries. Roosts in treetops, often distant from feeding areas. Nests in proximity to feeding areas if possible, most typically selecting hollows in the limb or trunk of smooth-barked Eucalypts. Entrance is small (3 cm) and usually high above the ground (2–15 m). These nest sites are often used repeatedly for decades, suggesting that preferred sites are limited. Riparian trees often chosen, including species like Allocasuarina. Nesting season extends from May to September. In years when flowering is prolific, Little Lorikeet pairs can breed twice, producing 3-4 young per attempt. However, the survival rate of fledglings is unknown. Forages primarily in the canopy of open Eucalyptus forest and woodland, yet also finds food in Angophoras, Melaleucas and other tree species. Riparian habitats are particularly used, due to higher soil fertility and hence greater productivity. Isolated flowering trees in open country, e.g. paddocks, roadside remnants and urban trees also help sustain viable populations of the species.	Vulnerable		Known		Potential

Common Name	Scientific Name	Habitat and Ecology (OEH Species Profile and /or EPBC SPRAT Profile)	TSC Act Status	EPBC Act Status	OEH Threatened Species Search	DSEWPaC Protected Matters Search	Potential to occur
Little Pied Bat	*Chalinolobus picatus*	Occurs in dry open forest, open woodland, mulga woodlands, chenopod shrublands, cypress-pine forest, mallee, Bimbil box. Roosts in caves, rock outcrops, mine shafts, tunnels, tree hollows and buildings. Can tolerate high temperatures and dryness but need access to nearby open water. Feeds on moths and possibly other flying invertebrates.	Vulnerable		Known		Potential.
Magpie Goose	*Anseranas semipalmata*	Mainly found in shallow wetlands (less than 1 metre deep) with dense growth of rushes or sedges. Equally at home in aquatic or terrestrial habitats; often seen walking and grazing on land; feeds on grasses, bulbs and rhizomes. Activities are centred on wetlands, mainly those on floodplains of rivers and large shallow wetlands formed by run-off; breeding can occur in both summer and winter dominated rainfall areas and is strongly influenced by water level; most breeding now occurs in monsoonal areas; nests are formed in trees over deep water; breeding is unlikely in south-eastern NSW. Often seen in trios or flocks on shallow wetlands, dry ephemeral swamps, wet grasslands and floodplains; roosts in tall vegetation.	Vulnerable		Known		Unlikely. Suitable habitat for this species does not occur in the Subject Site.
Major Mitchell's Cockatoo	*Lophochroa leadbeateri*	Inhabits a wide range of treed and treeless inland habitats, always within easy reach of water. Feeds mostly on the ground, especially on the seeds of native and exotic melons and on the seeds of species of saltbush, wattles and cypress pines. Normally found in pairs or small groups, though flocks of hundreds may be found where food is abundant. Nesting, in tree hollows, occurs throughout the second half of the year; nests are at least 1 kilometre apart, with no more than one pair every 30 square kilometres.	Vulnerable		Known		Potential to occur in the Subject Site.
Malleefowl	*Leipoa ocellata*	Predominantly inhabit mallee communities, preferring the tall, dense and floristically-rich mallee found in higher rainfall (300 - 450 mm mean annual rainfall) areas. Utilises mallee with a spinifex understorey, but usually at lower densities than in areas with a shrub understorey. Less frequently found in other eucalypt woodlands, such as Inland Grey Box, Ironbark or Bimble Box Woodlands with thick understorey, or in other woodlands such dominated by Mulga or native Cypress Pine species.	Endangered	Endangered	Predicted	Species or species habitat known to occur within area	No. Suitable habitat for this species does not occur in the Subject Site. No mallee habitat in the Subject Site or adjacent mallee habitat.

Common Name	Scientific Name	Habitat and Ecology (OEH Species Profile and /or EPBC SPRAT Profile)	TSC Act Status	EPBC Act Status	OEH Threatened Species Search	DSEWPaC Protected Matters Search	Potential to occur
		Prefers areas of light sandy to sandy loam soils and habitats with a dense but discontinuous canopy and dense and diverse shrub and herb layers. Although Malleefowl will occupy areas within five years of fire, they prefer older age classes, with little breeding in areas less than 20 years after fire, and in one study the highest densities recorded in long unburnt mallee (60 to 80 years post fire). A pair may occupy a range of between 50 and 500 ha, overlapping with those of their neighbours. Mainly forage in open areas on seeds of acacias and other native shrubs (*Cassia, Beyeria, Bossiaea*), buds, flowers and fruits of herbs and various shrubs, insects (cockroaches, ants, soil invertebrates), and cereals if available. Incubate eggs in large mounds that contain considerable volumes of sandy soil. The litter within the mounds must be dampened for it to decompose and provide heat for incubation of eggs. Up to 34 eggs may be laid in a single season, though usually between 15 and 24 (and clutches smaller in dry years). The male monitors the temperature within the egg chamber using its bill, and regularly works the mound during the breeding season to maintain a constant temperature around 34 degrees. The chicks hatch after between 49 and 96 days (average around 60) and can walk as soon as they emerge from the mound, can run quickly within two hours and can fly within 24 hours.					
Masked Owl	*Tyto novaehollandiae*	Roosts and breeds in moist eucalypt forested gullies, using large tree hollows or sometimes caves for nesting. Lives in dry eucalypt forests and woodlands from sea level to 1100 m. A forest owl, but often hunts along the edges of forests, including roadsides. The typical diet consists of tree-dwelling and ground mammals, especially rats. Pairs have a large home-range of 500 to 1000 hectares.	Vulnerable		Known		Potential. Suitable breeding habitat (large hollow bearing trees and tall forest trees) for this species does not occur in the Subject Site. Potential to hunt in the Subject Site.
Murray Cod	Maccullochella peelii peelii	The Murray Cod is the largest freshwater fish found in Australia. It is a long lived predator species that is highly territorial and aggressive. It occurs naturally in the waterways of the Murray–Darling Basin in a wide range of warm water habitats that range from clear, rocky streams to slow flowing turbid rivers and billabongs. The upper reaches of the Murray and Murrumbidgee Rivers are considered too cold to contain suitable habitat.	FM Act	Vulnerable		Species or species habitat may occur within Area	No. The works will not occur in proximity likely habitat

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Mauve Burr-daisy	Calotis glandulosa	Found in montane and subalpine grasslands in the Australian Alps. Found in subalpine grassland (dominated by Poa spp.), and montane or natural temperate grassland dominated by Kangaroo Grass (Themeda australis) and Snow Gum (Eucalyptus pauciflora) Woodlands on the Monaro and Shoalhaven area.	Vulnerable	Vulnerable	Known		No
Myall Woodland in the Darling Riverine Plains, Brigalow Belt South, Cobar Peneplain, Murray-Darling Depression, Riverina and NSW South Western Slopes bioregions		This EEC is known from parts of the Local Government Areas of Berrigan, Bland, Bogan, Carrathool, Conargo, Coolamon, Coonamble, Corowa, Forbes, Gilgandra, Griffith, Gwydir, Inverell, Jerilderee, Lachlan, Leeton, Lockhart, Moree Plains, Murray, Murrumbidgee, Narrabri, Narranderra, Narromine, Parkes, Urana, Wagga Wagga and Warren, and but may occur elsewhere in these bioregions.	Endangered Ecological Community	Endangered	Known	Community may occur within area	No
Natural grasslands on basalt and fine-textured alluvial plains of northern New South Wales and southern Queensland		Native tussock grasslands, such as the Natural grasslands on basalt and fine-textured alluvial plains of northern NSW and southern Queensland, once occurred over a large area of Australia (DEWR 2007). The species composition of tussock grasslands varies throughout its range and is influenced by factors such as rainfall, soil, geology and land use history. These influences may vary the expression of the ecological community over short periods or across small distances (Butler 2007 unpublished).	Natural Temperate Grassland of the Southern Tablelands (NSW Act)	Critically Endangered		Community may occur within area	No
Painted Honeyeater	*Grantiella picta*	Inhabits Boree, Brigalow and Box-Gum Woodlands and Box-Ironbark Forests. A specialist feeder on the fruits of mistletoes growing on woodland eucalypts and acacias. Prefers mistletoes of the genus Amyema. Insects and nectar from mistletoe or eucalypts are occasionally eaten. Nest from spring to autumn in a small, delicate nest hanging within the outer canopy of drooping eucalypts, she-oak, paperbark or mistletoe branches.	Vulnerable		Known		Potential.
Painted Snipe	Rostratula australis	Prefers fringes of swamps, dams and nearby marshy areas where there is a cover of grasses, lignum, low scrub or open timber.	Vulnerable	Vulnerable	Known	Species or species habitat may	No