



# **PLANNING PROPOSAL**

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## **COFFS HARBOUR CITY COUNCIL**

**Newmans Road, Woolgoolga  
Part Lot 202 DP 874273**

**VERSION 1 – Pre-Exhibition  
September 2019**

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# INTRODUCTION

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## Planning Proposal

The preparation of a Planning Proposal is the first step in making an amendment to the *Coffs Harbour Local Environmental Plan 2013* (LEP 2013). A Planning Proposal is a document that explains the intended effect and justification for the proposed amendment. Under the *Environmental Planning and Assessment Act 1979*, Council must prepare and submit a Planning Proposal to the Department of Planning, Industry and Environment for consideration of an amendment to LEP 2013.

This Planning Proposal has been prepared in accordance with the *Environmental Planning and Assessment Act 1979* and the NSW Department of Planning, Industry and Environment's *A guide to preparing planning proposals 2018* and *A guide to preparing local environmental plans 2018*.

It explains the intended effects of a proposed amendment to LEP 2013 to enable low density residential development and manage the environmental attributes on land at Newmans Road Woolgoolga.

## Purpose of this Planning Proposal

The purpose of this Planning Proposal is to amend LEP 2013 to allow low density residential development on part of Lot 202 DP 874273. The Planning Proposal will:

- rezone the subject land from Zone RU2 Rural Landscape to part Zone R2 Low Density Residential and part Zone E3 Environmental Management,
- amend the relevant lot size map accordingly,
- create an additional “key sites” clause within LEP 2013 and create a new key sites map accordingly, and
- enable the development of the land for low density residential purposes, subject to the preparation of a development control plan that will ensure that any development of the area occurs in an orderly, logical and sustainable manner.

## Property details

This Planning Proposal applies to part of Lot 202 DP 874273, being an allotment comprising two portions, separated by public open space land. Lot 202 DP 874273 includes a northern portion; referenced in Figure 1 as ‘Bark Hut Road Planning Area’ and a southern portion; referenced in Figure 1 as ‘Newmans Road Planning Area’. This Planning Proposal applies to the Newmans Road Planning Area (the subject land) only and consideration of the Bark Hut Road Planning Area is subject to a separate Planning Proposal.



Figure 1: Locality Map: Lot 202 DP 874273

### Site location, context and setting

The subject land has an area of 9.2 hectares and is located approximately 22 km north of Coffs Harbour and 1.4 km northwest of Woolgoolga. The subject land is located in close proximity to the established residential areas of Woolgoolga and Safety Beach and a Large Lot Residential precinct is also located to the west. The subject land is situated west of Solitary Islands Way (the former Pacific Highway) and is accessed by Newmans Road. The land is currently zoned RU2 Rural Landscape under LEP 2013 and the zones of land in the immediate vicinity are shown in Figure 2.

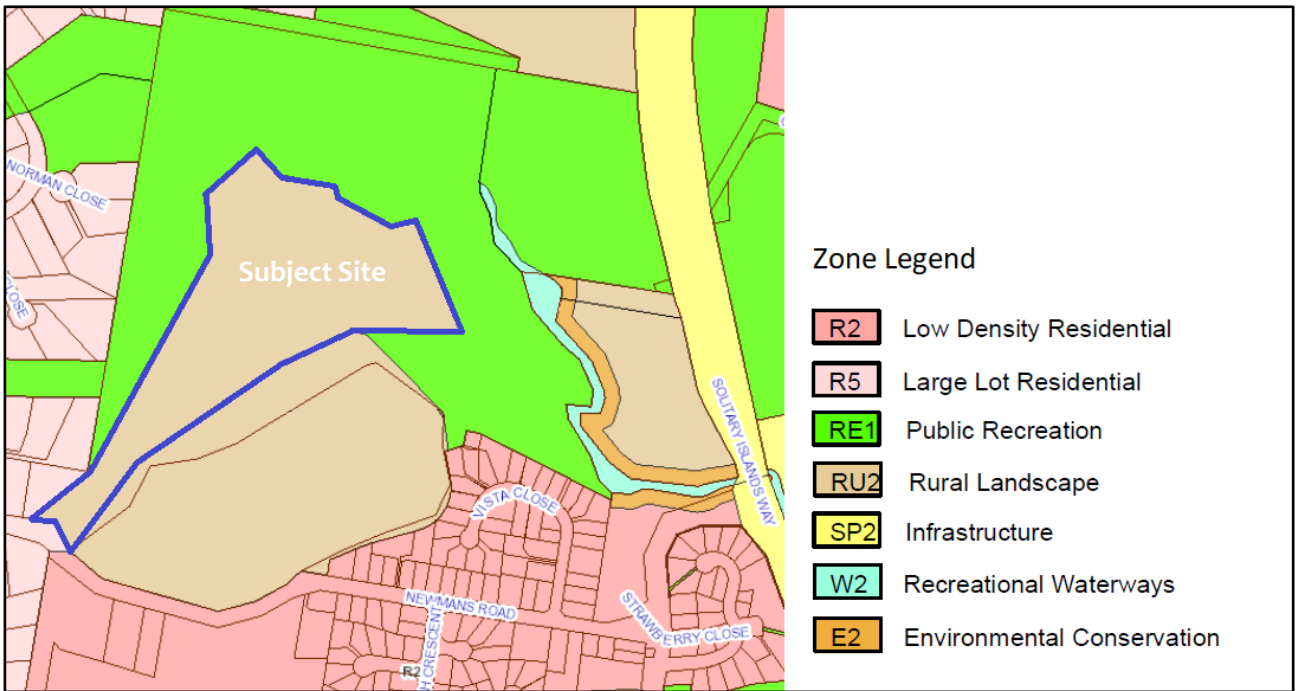


Figure 2: Current Land Use Zones – Coffs Harbour LEP 2013

An aerial photograph of the subject land is shown in Figure 3.



Figure 3: Aerial Photograph of the Subject land

**Concept low density residential subdivision**

A landscape character conceptual masterplan and low density residential subdivision lot layout is included in Appendix A. The Proponent’s indicative 82 lot subdivision concept for the site is also shown in Figure 4 below:

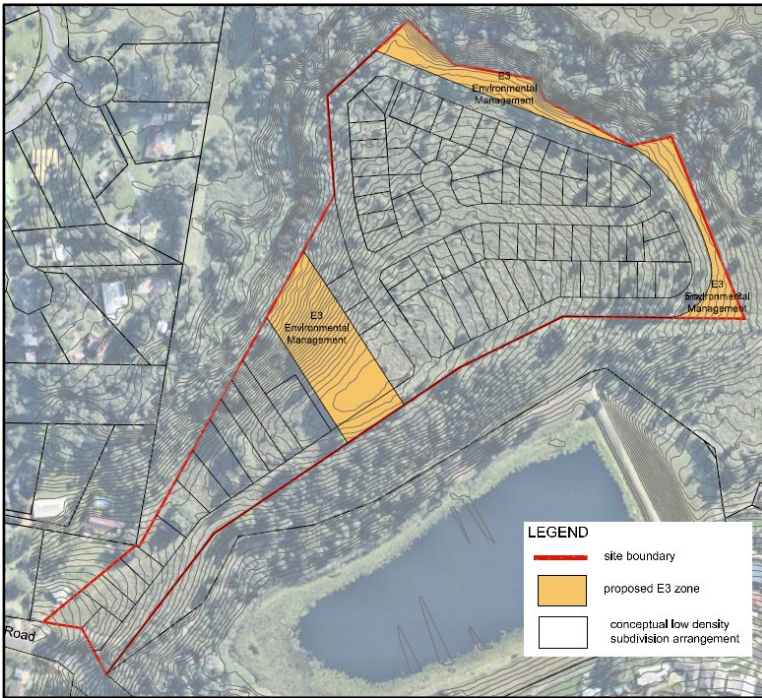


Figure 4: concept low density residential subdivision

**Note:**

The concept masterplan submitted by the proponent with the application to amend Coffs Harbour LEP 2013 for the subject site is not endorsed by Council. Detailed masterplanning for the subject site is to be addressed as part of any subsequent development application for the land.

## **PART 1 – OBJECTIVES OR INTENDED OUTCOMES**

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The objectives and intended outcomes of this Planning Proposal are to:

- Amend LEP 2013 to permit low density residential development on the subject land, subject to the preparation of a development control plan for the Woolgoolga North West growth area;
- Ensure that Woolgoolga North West is developed in accordance with sound planning and design principles; and
- Ensure that the rezoning is consistent with the broad strategic direction for the locality as described by North Coast Regional Plan 2036 and Council's LGMS (2008).

## **PART 2 – EXPLANATION OF PROVISIONS**

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The intended outcomes of the Planning Proposal will be achieved by making the following amendments to LEP 2013 maps:

- Amend the Coffs Harbour Land Zoning Map (Sheet LZN\_005F) over Part Lot 202 DP 874273, Newmans Road, Woolgoolga to change land currently zoned RU2 Rural Landscape to part Zone R2 Low Density Residential and part Zone E3 Environmental Management;
- Amend the Coffs Harbour Minimum Lot Size Map (Sheet LSZ\_005F) over Part Lot 202 DP 874273, Newmans Road, Woolgoolga to change land currently subject to minimum lot size provision AB – 40ha to part AB – 40ha and part F – 400 sqm;
- Amend the Coffs Harbour Terrestrial Biodiversity Map (Sheet CL2\_005F) over Part Lot 202 DP 874273, Newmans Road, Woolgoolga to include areas proposed to be zoned E3 Environmental Conservation as terrestrial biodiversity on the map; and
- Introduce a new Coffs Harbour Key Sites Map (KYS\_005F).

All of the above amendments to LEP 2013 maps are shown in Part 4 (mapping) of this Planning Proposal.

The rezoning includes the application of an R2 Low Density Residential Zone, as well as an E3 Environmental Management Zone. In this situation, the E3 zone is a suitable 'transitional' zone between RE1 Public Recreation zoned land surrounding the site that is partially cleared and partially inclusive of remnant wet sclerophyll forest and an R2 Low Density Residential zone. Native vegetation located within the proposed E3 zoned land, some of which adjoins the existing RE1 zoned land, contribute to valuable flora and fauna connections through to adjacent land. The protection of this vegetation is outlined in a Vegetation Management Plan (Appendix C) which will need to accompany a Development Application for subdivision of the subject land that is consistent with the concept subdivision shown in Appendix A. The inclusion of a Vegetation Management Plan with a subdivision application is a requirement of chapter E1.5(12) of Coffs Harbour Development Control Plan 2015.

A "key sites" clause is also included in this planning proposal. As further outlined in Part 3 of this planning proposal, the land is included within Council's Local Growth Management Strategy 2008 – Urban Lands Component as a "possible future urban investigation" area and at the time, was given a long term priority (after 2031). The land is also within the growth area boundary for Woolgoolga, mapped in the *North Coast Regional Plan 2036*. Due to the long-term priority given to the land and the significant dwelling capacity earmarked for the area (see figure 4), it is appropriate to masterplan the area and prepare a site specific Development Control Plan chapter within Coffs Harbour Development Control Plan 2015, as well as an associated Developer Contributions Plan for Woolgoolga North West. Part 7 of Coffs Harbour LEP 2013 is proposed to include a "key sites" clause similar to the following:

## **Development on certain land at Woolgoolga North West (Part Lot 202 DP 874273, Newmans Road Woolgoolga)**

1. The objectives of this clause are:
  - a) to ensure the subject land is developed in accordance with sound planning and design principles, and
  - b) to ensure development is carried out in an orderly, structured manner and is sympathetic of the constraints to the land and surrounding land uses.
2. This clause applies to land identified as “Woolgoolga North West” on the Key Sites Map.
3. Development consent must not be granted for development on land to which this clause applies unless a development control plan that provides for the matters specified in subclause (4) has been prepared for the land.
4. The development control plan must provide for the following:
  - a) masterplan to guide future development within Woolgoolga North West,
  - b) the appropriate use of land for residential development and infrastructure provision having regard to the environmental and other constraints of Part Lot 202 DP 874273 (such as bush fire, water quality, Aboriginal heritage and surrounding land uses particularly agricultural activities including but not limited to associated buffer requirements to minimize impacts from dust, noise and spray drift),
  - c) subdivision layout,
  - d) pedestrian and cycleway connectivity within future development and to adjoining public reserve areas,
  - e) an integrated traffic management strategy which ensures the safe and efficient movement of traffic within the development and onto adjoining land, and
  - f) the management, protection and (where appropriate) rehabilitation of high conservation value land.
5. Subclause (3) does not apply to development for any of the following purposes:
  - a) a subdivision for the purpose of a realignment of boundaries that does not create additional lots,
  - b) a subdivision of land if any of the lots proposed to be created are to be reserved or dedicated for public open space, public roads or any other public or environmental protection or management purpose,
  - c) a subdivision of land in a zone in which erection of structures is prohibited,
  - d) development of land that is of a minor nature only, if the consent authority is of the opinion that the carrying out of the proposed development would be consistent with the objectives of the zone in which the land is situated.



## PART 3 – JUSTIFICATION

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### Section A – Need for the Planning Proposal

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

This Planning Proposal has been prepared in response to a landowner's request and is accompanied by a number of detailed environmental studies, which are included as attachments. The subject site is included in Council's Local Growth Management Strategy 2008 – Urban Lands Component as a “possible future urban investigation” area. At the time, the investigation of this land for urban purposes was given a long-term priority (after 2031). The land is also included in the Coffs Harbour Draft Local Growth Management Strategy currently being prepared by Council and is shown within the growth area boundary for Woolgoolga, as mapped in the *North Coast Regional Plan 2036*.

A detailed Residential Land Demand Analysis accompanies this Planning Proposal (refer Appendix B), which concluded that:

*It is estimated that there is only three years of serviced residential zoned land supply available to the market within the Study Area, including land that is currently not being developed and subject to owner intents and commercial viabilities.*

As mentioned above, Council is currently undertaking a review of the Local Growth Management Strategy (LGMS). Peer review of this Planning Proposal has identified that it is consistent with the objectives of the Draft LGMS ‘Strategic Approach’, particularly:

- The subject site is identified within the Woolgoolga North West Growth Area in the LGMS as a high priority 1-4 years land release program.
- Residential demand for the entire (Woolgoolga North West) growth area indicates that there is capacity for additional 1030 total dwelling yield (see figure 5).
- The LGMS also identifies that greenfield developments should carefully consider environmental constraints, water sensitive design and walkability.

Ensuring there is sufficient residential zoned land to meet present and future demand is also an important consideration in maintaining housing affordability.

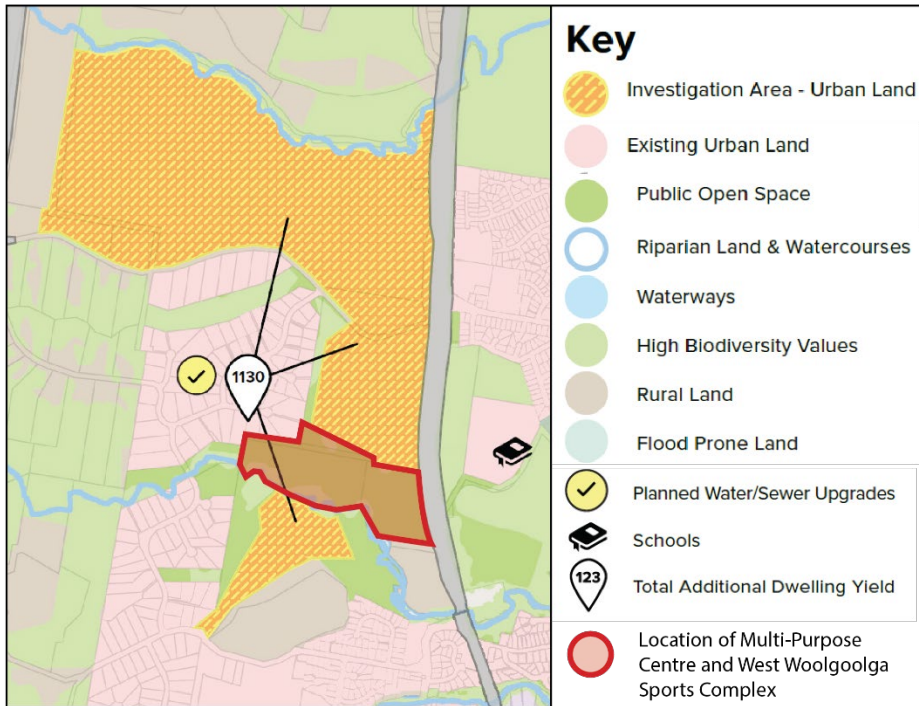


Figure 5: Draft LGMS - Dwelling Capacity in NW Woolgoolga

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

This Planning Proposal is not an overall review of the City controls proposed through the preparation of an LGA wide LEP review. Therefore, a site specific Planning Proposal accompanied by relevant environmental planning studies is the only way of achieving the release of additional residential land at Woolgoolga North West. Achieving the intended outcomes outlined in this Planning Proposal is also dependent on the preparation of a masterplan for Woolgoolga North West, for inclusion within a site-specific Development Control Plan chapter within Coffs Harbour Development Control Plan 2015 and an associated Developer Contributions Plan.

**3. Is there a net community benefit?**

The rezoning of the subject land enables the development of approximately 82 low-density residential lots within a 9.2 ha portion of the site proposed to be zoned R2 Low Density Residential.

Net Community Benefit Criteria are identified in the NSW Government’s publication *The Right Place for Business and Services*. This policy document has a focus on ensuring growth within existing centres and minimising dispersed trip-generating development. It applies most appropriately to Planning Proposals that promote significant increased residential areas or densities, or significant increased employment areas or the like.

A net community benefit test (NCBT) analyses the potential social and economic impact to the Woolgoolga community arising from the Planning Proposal and assesses whether the site is suitable for rezoning and will provide positive benefits to the community. A summary of potential benefits and costs is outlined below.

The ‘base case’ is that the land remains under its present RU2 Rural Landscape zoning.

### Potential benefits versus Base Case

- Increasing land for housing supply in the Woolgoolga North West locality by approximately 82 lots suitable for detached low-density dwellings.
- Contributing to the stock of unconstrained land for vernacular housing.
- Meeting the forecasted population increase for the Coffs Coast area by increasing the supply of unconstrained residential land to the Woolgoolga area.

### Costs of future development versus Base Case

- Short-term increase in heavy vehicle traffic during the construction phase of the subdivision. Appropriate mitigation measures would need to be implemented.
- Short-term adverse impacts on environmental amenity during the construction process. Appropriate mitigation measures would need to be implemented.
- Loss of rural land, although the site is not currently used for agricultural purposes and holds little agricultural potential, being located amongst existing and proposed residential lands.

The associated negative impacts of the proposal are considered to be manageable. The Planning Proposal will deliver land for housing in accordance with projected lot yields for the area and therefore is likely to provide a net community benefit.

### Section B – Relationship to strategic planning framework

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

##### North Coast Regional Plan 2036

The *North Coast Regional Plan 2036* applies to the Coffs Harbour LGA. The land is identified as an Urban Growth Area in the *North Coast Regional Plan 2036*, as shown in Figure 6.



Figure 6: Context within the North Coast Regional Plan 2036

The following outlines how the Planning Proposal complies with the Goals and Directions contained in the *North Coast Regional Plan 2036*:

## Goal 1: The most stunning environment in NSW

### Direction 1: Deliver environmentally sustainable growth

The subject land is within the *North Coast Regional Plan 2036* urban growth area boundary. These areas have been identified to achieve a balance between urban expansion and protecting coastal and other environmental assets.

The proposed key sites clause will allow master planning of the overall Woolgoolga North West growth area and will allow Council to deliver environmentally sustainable growth.

The subject land is surrounded by residential development and is close to urban services including schools and a shopping centre. The land is not located near any significant farmland or sensitive ecosystems.

### Direction 2: Enhance biodiversity, coastal and aquatic habitats, and water catchments

Ecological features in proximity to the subject site include an area of wet sclerophyll forest along the northern boundary, which is mapped secondary koala habitat. This connects to Poundyard Creek and flows to Woolgoolga Lake to the east. Connecting Poundyard Creek and the large freshwater wetland located outside the southern boundary is a patch (approximately 500 m<sup>2</sup>) of brushbox (*Lophostemon confertus*), turpentine (*Syncarpia glomulifera*) and a few large diameter tallowwoods (*Eucalyptus microcorys*) which is mapped dry sclerophyll forest. Tallowwood is an important koala food tree (KFT).

As described above, the remnant native vegetation, whilst not an EEC, has biodiversity importance and should therefore be recognised in an appropriate environmental zone. None of these areas have especially high conservation values, and do not meet planning criteria for the E2 Environmental Conservation zone under either the Practice Note PN 11-002 or the Northern Councils E zone recommendations. These areas are proposed to be zoned E3 Environmental Management to provide for the management actions recommended in the Preliminary Vegetation Management Plan (Appendix C).

### Direction 3: Manage natural hazards and climate change

A concept low density subdivision master plan (Appendix A) has been prepared to indicate a potential internal road and lot layout and overall lot yield.

Perimeter roads as shown in the concept master plan and the management actions described in the preliminary VMP will be an important part of future bushfire hazard protection.

### Direction 4: Promote renewable energy opportunities

The proposed residential area has a suitable microclimate within a generally north easterly facing valley; resulting in good solar access opportunities which will enable resulting low density residential development to design accordingly.

## **Goal 2: A thriving, interconnected economy**

### Direction 5: Strengthen communities of interest and cross-regional relationships

The proposed residential area will have good access to local employment opportunities as well as the Pacific Highway for broader regional opportunities.

### Direction 6: Develop successful centres of employment

The additional residential area will support the existing Woolgoolga business and industrial areas and will help strengthen the Coffs Harbour LGA as a centre of employment.

### Direction 7: Coordinate the growth of regional cities

The proposed rezoning supports the growth and redevelopment of Coffs Harbour (a designated regional city), and is consistent with the *North Coast Regional Plan 2036* and Council's Local Growth Management Strategy.

### Direction 8: Promote the growth of tourism

The proposed residential area will indirectly provide for tourism by providing land for housing, which may cater for tourism workers.

### Direction 9: Strengthen regionally significant transport corridors

The proposed residential area is in close proximity to Solitary Islands Way, which is a connector road to the Pacific Highway.

### Direction 10: Facilitate air, rail and public transport infrastructure

The proposed residential area is accessible to air and rail transport nodes in Coffs Harbour, via the Pacific Highway. Local bus services are available nearby in Newmans Road and will be able to service the proposed residential area.

### Direction 11: Protect and enhance productive agricultural lands

The subject site does not contain highly productive agricultural land and is not identified as Regionally Significant Farmland.

### Direction 12: Grow agribusiness across the region

The proposed rezoning will not adversely affect any existing agribusiness.

### Direction 13: Sustainably manage natural resources

The proposed rezoning will not adversely affect any nearby natural resources.

### Goal 3: Vibrant and engaged communities

#### Direction 14: Provide great places to live and work

The proposed key sites clause and map will allow master planning of the overall Woolgoolga North West growth area and will outline how low-density residential development will interact with surrounding land. *Coffs Harbour Development Control Plan 2015* will include a masterplan and specific controls to guide new development to assist the Woolgoolga North West growth area to integrate into surrounding urban areas, including its relationship with nearby road networks and open space.

#### Direction 15: Develop healthy, safe, socially engaged and well-connected communities

The concept master plan submitted with the Planning Proposal (Appendix A) illustrates passive links to the surrounding open space and future sporting fields. There are possibilities for links between the subject land and the Woolgoolga Sporting Fields and with the Woolgoolga State High School and the existing network of cycleways and paths on the eastern side of Solitary Islands Way.

The proposed master planning exercise provides an opportunity to ensure that these communities are well-connected with their surroundings. Existing DCP objectives and controls aim to *ensure that subdivision proposals provide appropriate connectivity for servicing vehicular, walking and cycling networks*. Subdivision infrastructure including cycleways, footpaths and street lighting will ensure that future residential areas are both healthy and safe via crime prevention through environmental design outcomes.

#### Direction 16: Collaborate and partner with Aboriginal communities

The Aboriginal community were engaged in site investigations to inform the Aboriginal Cultural Heritage Assessment Report (Appendix D). A consultation process with the Aboriginal community was undertaken in accordance with the (former) OEH *Aboriginal Cultural Heritage Consultation Requirements for Proponents (2010)* (ACHCRP).

#### Direction 17: Increase the economic self-determination of Aboriginal communities

The Planning Proposal will not have outcomes that are contrary to this direction.

#### Direction 18: Respect and protect the North Coast's Aboriginal heritage

The results of the Archaeological Assessment are summarised as follows:

- *A PAD was identified in the vicinity of the Project Area comprising a knoll to the west of the water storage dam however no Aboriginal objects were identified on the knoll. However, the presence of topsoil on the knoll provides an indication that there is the potential for an Aboriginal stone artefact scatter to occur on the knoll.*
- *Having consideration for the landscape context of the Project Area and the history of disturbance it is considered unlikely that the Project Area will contain Aboriginal sites of high or moderate conservation value. The Project Area is unlikely to contain burials or middens and does not contain scarred or modified trees. Whilst some historic campsites are known in the general vicinity the site, none are known within the Project Area. No Mythological or ceremonial sites are known to occur*

*within the Project Area, however it is noted that the ridge-crest may have been utilised as a pathway between the coast and hinterland.*

An onsite AHIP consultation meeting was held on 18<sup>th</sup> January 2018 with the applicant's cultural heritage consultant and members of the local Aboriginal community and the Coffs Harbour and District Local Aboriginal Land Council. According to the report (Appendix D), those present agreed that the rezoning would be acceptable.

It is also appropriate that a Gateway Determination should require further consultation with local Aboriginal stakeholders and the NSW Department of Premier and Cabinet.

Direction 19: Protect historic heritage

No historic heritage is identified within the Planning Proposal area.

Direction 20: Maintain the region's distinctive built character

Existing Coffs Harbour DCP 2015 controls will assist in preserving the distinctive North Coast built character.

Direction 21: Coordinate local infrastructure delivery

Local infrastructure will be coordinated via Council's Development Servicing Plans.

**Goal 4: Great housing choice and lifestyle options**

Direction 22: Deliver greater housing supply

The proposed rezoning will result in an estimated 82 additional low density residential allotments within the subject land.

Direction 23: Increase housing diversity and choice

The proposed residential area will be rezoned R2 Low Density Residential which provides for a range of residential accommodation land uses.

Direction 24: Deliver well-planned rural residential housing areas

Existing and future Large Lot (ie rural) Residential precincts are identified by Council's LGMS. This Planning Proposal does not propose Large Lot Residential zoned land.

Direction 25: Deliver more opportunities for affordable housing

The minimum lot size for the proposed development is one lot/dwelling per 400 m<sup>2</sup> which is the standard allotment size for the majority of low density residential housing in the Coffs Harbour LGA. The release of the subject land for low density residential housing purposes will provide additional affordable housing choice for the Woolgoolga locality.

**5. Is the Planning Proposal consistent with the local council’s Community Strategic Plan, or other local strategic plan?**

**MyCoffs Community Strategic Plan**

Coffs Harbour City Council’s Community Strategic Plan (MyCoffs) is based on four key themes, being: Community Wellbeing, Community Prosperity, and a Place for Community, and Sustainable Community Leadership.

This Planning Proposal is consistent with the following relevant Objectives from the MyCoffs Plan:

An active, safe and healthy community	A2.1: We support our community to lead healthy active lives
A thriving and sustainable local economy	B1.2 We attract people to work, live and visit in the Coffs Harbour local government area
Liveable neighbourhoods with a defined identity	C1.1 - We create livable spaces that are beautiful and appealing. C1.2 We undertake development that is environmentally, socially and economically responsible
A natural environment sustained for the future	C2.1: We protect the diversity of our natural environment. C2.2: We use resources responsibly to support a safe and stable climate.
Our leaders give us confidence in the future	D1.2 We undertake effective engagement and are informed
We have effective use of public resources	D2.1 - We effectively manage the planning and provision of regional public services and infrastructure. D2.2 We collaborate to achieve the best possible future for all the Coffs Harbour area

**Local Growth Management Strategy – Urban Lands Component 2008**

Council’s Local Growth Management Strategy (LGMS) – Urban Lands Component was finalised in 2008. The LGMS sets out a future for the growth and development of the LGA until 2031. The goal of the LGMS – Urban Lands Component is to foster healthy urban communities which contribute to delivering the Vision for the City. The Vision is described as: The Healthy City, the Smart City and the Cultural City for our future.

The LGMS projects a population of 99,000 people by 2031 with 94,000 accommodated in existing zoned areas and the balance of 6000 people expected to be accommodated in Greenfield sites. The LGMS states that “Projected population growth indicates that, at existing rates of consumption, additional land will be required for residential purposes by the period 2016-2021 in proximity to the Coffs Harbour Township [City].”

The LGMS – Urban Lands Component is presented in five parts. Part 3 of the Strategy contains the overall Strategy, and provides details on development areas and recommended priority releases for each area. The Strategy concentrates growth in the City’s Central Business District (CBD) and key centres. It offers a hierarchy of Coffs Harbour as Coastal City; Woolgoolga, Moonee and



Sawtell/Toormina/Boambee as Coastal Towns; and other settlements generally as Coastal and Hinterland Villages.

Detailed strategies are outlined for each urban area along with recommendations for future Place Management Plans for each of these areas. Part 3 also contains a supply and demand supply analysis based on population projections, and a servicing analysis.

Part 5 of the LGMS – Urban Lands Component refers to a series of maps, which include detailed strategies for each urban area within the LGA. These identify future development areas, expected limits to growth and key strategic actions for each area. In addition, each Map includes a series (A, B and C), which provide for each urban investigation area:

- expected lot yields;
- development areas; and
- constraints.

Map 4 of the LGMS – Urban Lands Component includes Woolgoolga, which in turn includes the subject site shown as a ‘possible future urban investigation’ area.

Map 4A provides details on urban investigation areas and shows the subject land as a ‘possible future urban investigation area’.

Map 4B provides details on proposed agreed growth areas and shows the site as ‘residential after 2031’ and potentially capable of housing 90 dwellings.

Map 4C deals with constraints, and shows the land as being generally unconstrained.

When applying the underlying growth principles of the LGMS, the proposed rezoning will achieve the following:

- deliver housing diversity and choice;
- provide walkable neighbourhoods by ensuring good connectivity between the development and West Woolgoolga Sporting Fields; and
- enhance the economic and social functions of existing local centres.

It is also acknowledged that the subject land is not highly constrained, can be efficiently serviced and has access to existing established areas of Safety Beach, Arrawarra/Mullaway, Woolgoolga High School and the Pacific Highway bypass.

### **Local Growth Management Strategy – Strategic Approach**

Council’s peer review of this Planning Proposal reveals that it is consistent with the strategic approach taken by the revised draft Local Growth Management Strategy currently being prepared by Council, particularly:

- The subject land is identified within the Woolgoolga North West Growth Area in the draft Local Growth Management Strategy as a high priority 1-4 year land release program.
- Residential demand for the entire growth area indicates that there is capacity for an additional 1030 total dwelling yield.

- The draft Local Growth Management Strategy also identifies that greenfield developments should carefully consider environmental constraints, water sensitive design and walkability.

## 6. Is the Planning Proposal consistent with applicable State Environmental Planning Policies?

The State Environmental Planning Policies (SEPPs) applicable to the Planning Proposal are discussed in Table 1 below:

**Table 1: Consistency with applicable SEPPs**

State Environmental Planning Policy	Comments	Consistency
SEPP No 1 – Development Standards	This Planning Proposal does not contain provisions that contradict or hinder the application of this SEPP.	Consistent
SEPP No 21 – Caravan Parks	This Planning Proposal does not contain provisions that contradict or hinder the application of this SEPP.	Consistent
SEPP No 33 – Hazardous and Offensive Development	This Planning Proposal does not contain provisions that contradict or hinder the application of this SEPP.	Consistent
SEPP No 36 – Manufactured Home Estates	This Planning Proposal does not contain provisions that contradict or hinder the application of this SEPP.	Consistent
SEPP No 44 – Koala Habitat Protection	<p>This SEPP encourages the conservation and management of natural vegetation areas that provide habitat for koalas to ensure that permanent free-living populations will be maintained over their present range.</p> <p><b>Comment:</b> Council has an adopted <i>Koala Plan of Management 1999</i> (KPoM) which includes local provisions that apply to identified koala habitat. The KPoM identifies a small area on the northern boundary of the Subject land as Secondary Koala Habitat – see Figure 8. The provisions of the KPoM have been addressed in Appendix E to this Planning Proposal.</p>	Consistent.

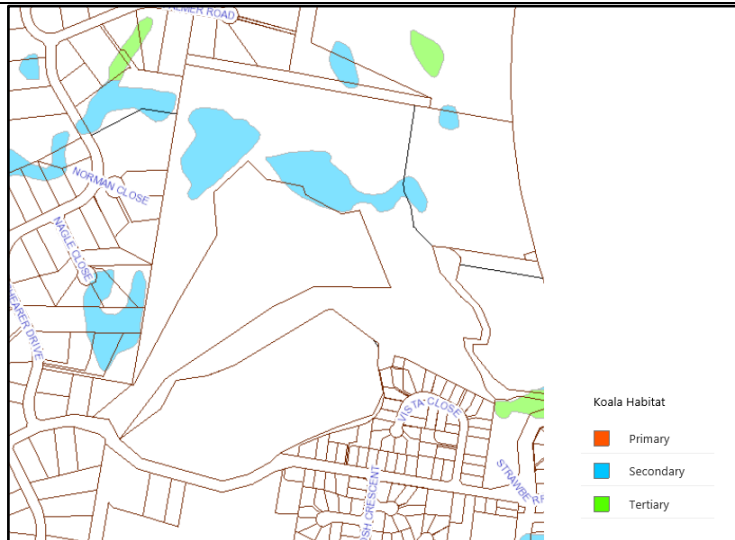
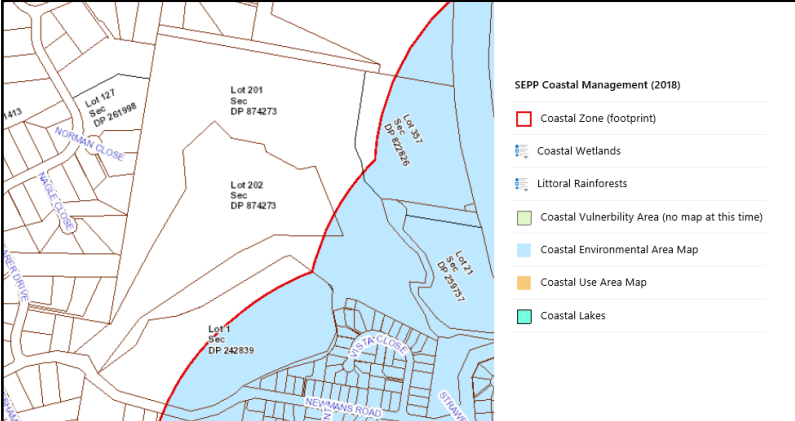


Figure 7: Koala Plan of Management Mapping

The Planning Proposal is consistent with the KPoM in that new areas of land zoned Zone E3 Environmental Management will provide additional protection for biodiversity connections and habitat links for Koalas and other threatened species. The Council has an adopted Koala Plan of Management for the LGA.

SEPP No 50 – Canal Estate Development	This Planning Proposal does not contain provisions that contradict or hinder the application of this SEPP.	Consistent
SEPP No 55 – Remediation of Land	<p>A review of previous land uses of the site suggests that contamination of the site is unlikely. Past uses include low intensity stock grazing and the land is not mapped as former banana cultivation land. Searches of the land contamination register, record of notices and contaminated sites notified to Environmental Protection Authority have not identified the subject land. Contamination potential is considered minimal and manageable with appropriate remediation procedures available.</p> <p>A preliminary site contamination investigation is included with this Planning Proposal (see Appendix I) which found that there were no exceedances of adopted assessment criteria and it is considered that there is a low potential for soil contamination to be present within the subject land.</p>	Consistent.
SEPP No 64 – Advertising and Signage	This Planning Proposal does not contain provisions that contradict or hinder the application of this SEPP.	Consistent
SEPP No 65 – Design Quality of Residential Flat Development	Residential flat buildings are prohibited in the R2 zone under Coffs Harbour Local Environmental Plan 2013.	Consistent.

<p>SEPP No 70 – Affordable Housing (Revised Schemes)</p>	<p>This Planning Proposal does not contain provisions that contradict or hinder the application of this SEPP.</p>	<p>Consistent</p>
<p>SEPP (Coastal Management) 2018</p>	<p><i>The aim of this Policy is to promote an integrated and co-ordinated approach to land use planning in the coastal zone in a manner consistent with the objects of the Coastal Management Act 2016, including the management objectives for each coastal management area by establishing a framework for land use planning to guide decision-making in the coastal zone.</i></p> <p>As shown in Figure 7 below, the eastern extremity of the site is located within the coastal environment area.</p>  <p>Figure 7: SEPP (Coastal Management) 2018</p> <p><b>Comment:</b> This SEPP states as follows:</p> <ol style="list-style-type: none"> <li>1) <i>Development consent must not be granted to development on land that is within the coastal environment area unless the consent authority has considered whether the proposed development is likely to cause an adverse impact on the following:</i> <ol style="list-style-type: none"> <li>(a) <i>the integrity and resilience of the biophysical, hydrological (surface and groundwater) and ecological environment,</i></li> <li>(b) <i>coastal environmental values and natural coastal processes,</i></li> <li>(c) <i>the water quality of the marine estate (within the meaning of the Marine Estate Management Act 2014), in particular, the cumulative impacts of the proposed development on any of the sensitive coastal lakes identified in Schedule 1,</i></li> <li>(d) <i>marine vegetation, native vegetation and fauna and their habitats, undeveloped headlands and rock platforms,</i></li> <li>(e) <i>existing public open space and safe access to and along the foreshore, beach, headland or rock platform for members of the public, including persons with a disability,</i></li> </ol> </li> </ol>	<p>Consistent.</p>

	<p>(f) <i>Aboriginal cultural heritage, practices and places,</i>  (g) <i>the use of the surf zone.</i></p> <p>2) <i>Development consent must not be granted to development on land to which this clause applies unless the consent authority is satisfied that:</i></p> <p>(a) <i>the development is designed, sited and will be managed to avoid an adverse impact referred to in subclause (1), or</i>  (b) <i>if that impact cannot be reasonably avoided—the development is designed, sited and will be managed to minimise that impact, or</i>  (c) <i>if that impact cannot be minimised—the development will be managed to mitigate that impact.</i></p> <p>As the affected area is very small and corresponds with a proposed E3 Environmental Management zone and an appropriate revegetation strategy, it is considered that the eventual development of the land will not compromise the aims of the SEPP.</p> <p>Woolgoolga Lake is listed as a sensitive coastal lake identified in Schedule 1 of the SEPP. Council’s DCP controls and Water Sensitive Urban Design Guidelines will ensure that future Development Application/s for subdivision incorporate water sensitive urban design into their design. This will help ensure that water quality levels are maintained and/or improved in waterways draining into Woolgoolga Lake.</p>	
SEPP (Affordable Rental Housing) 2009	This Planning Proposal does not contain provisions that contradict or hinder the application of this SEPP.	Consistent
SEPP (Building Sustainability Index: BASIX) 2004	This Planning Proposal does not contain provisions that contradict or hinder the application of this SEPP.	Consistent.
SEPP (Concurrences) 2018	This Planning Proposal does not contain provisions that contradict or hinder the application of this SEPP.	Consistent
SEPP (Educational Establishments and Child Care Facilities) 2017	This Planning Proposal does not contain provisions that contradict or hinder the application of this SEPP.	Consistent
SEPP (Exempt and Complying Development Codes) 2008	No additional exempt or complying uses have been included in this Planning Proposal.	Consistent.

SEPP (Housing for Seniors or People with a Disability) 2004	Seniors housing is permitted with consent in the R2 Low Density Residential Zone under Coffs Harbour Local Environmental Plan 2013.	Consistent.
SEPP (Infrastructure) 2007	This Planning Proposal does not contain provisions that contradict or hinder the application of this SEPP.	Consistent
SEPP (Mining, Petroleum Production and Extractive Industries) 2007	This Planning Proposal does not contain provisions that contradict or hinder the application of this SEPP.	Consistent
SEPP (Miscellaneous Consent Provisions) 2007	This Planning Proposal does not contain provisions that contradict or hinder the application of this SEPP.	Consistent
SEPP (Primary Production and Rural Development) 2019	<p><i>The aims of this Policy are:</i></p> <ul style="list-style-type: none"> <li><i>(a) to facilitate the orderly economic use and development of lands for primary production,</i></li> <li><i>(b) to reduce land use conflict and sterilisation of rural land by balancing primary production, residential development and the protection of native vegetation, biodiversity and water resources,</i></li> <li><i>(c) to identify State significant agricultural land for the purpose of ensuring the ongoing viability of agriculture on that land, having regard to social, economic and environmental considerations,</i></li> <li><i>(d) to simplify the regulatory process for smaller-scale low risk artificial waterbodies, and routine maintenance of artificial water supply or drainage, in irrigation areas and districts, and for routine and emergency work in irrigation areas and districts,</i></li> <li><i>(e) to encourage sustainable agriculture, including sustainable aquaculture,</i></li> <li><i>(f) to require consideration of the effects of all proposed development in the State on oyster aquaculture,</i></li> <li><i>(g) to identify aquaculture that is to be treated as designated development using a well-defined and concise development assessment regime based on environment risks associated with site and operational factors.</i></li> </ul> <p><b>Comment:</b> The Planning Proposal is consistent with the aims of the SEPP in that:</p> <ul style="list-style-type: none"> <li>• The lands affected by the Planning Proposal are excluded from Regionally Significant farmland considerations and are recognised as a future residential growth area by the <i>North Coast Regional Plan 2036</i>.</li> </ul>	Consistent.

	<ul style="list-style-type: none"> <li>• The site has not been used for productive agricultural uses for a significant amount of time, therefore, the impact on the overall availability of rural lands for this purpose will be negligible.</li> <li>• The land is small in area and is inappropriately located for sustainable agriculture, given its proximity to adjacent residential land and its recognition as an urban investigation area by Council's LGMS 2008 and as a future residential growth area by the <i>North Coast Regional Plan 2036</i></li> <li>• Social, economic and environmental interests are better served by rezoning the land for residential and environmental management purposes.</li> <li>• Important native vegetation will be managed under the provisions of the E3 zone.</li> <li>• The Planning Proposal is consistent with the <i>North Coast Regional Plan 2036</i>.</li> </ul>	
SEPP (State and Regional Development) 2011	This Planning Proposal does not contain provisions that contradict or hinder the application of this SEPP.	Consistent
SEPP (State Significant Precincts) 2005	This Planning Proposal does not contain provisions that contradict or hinder the application of this SEPP.	Consistent
SEPP (Vegetation in Non-Rural Areas) 2017	This Planning Proposal does not contain provisions that contradict or hinder the application of this SEPP. Coffs Harbour DCP 2015 contains requirements that address the removal of significant vegetation within the Coffs Harbour LGA.	Consistent

## 7. Is the Planning Proposal consistent with applicable Ministerial Directions (s9.1 directions)?

Consistency with applicable s9.1 Local Planning Directions is outlined in Table 2 below.

Table 2: Consistency with s9.1 (2) Directions

Ministerial Direction	Comments	Consistency with Direction
<b>1. Employment and Resources</b>		
1.1 Business and Industrial Zones	<p>The objectives of this direction are to:</p> <ul style="list-style-type: none"> <li>(a) encourage employment growth in suitable locations,</li> <li>(b) protect employment land in business and industrial zones, and</li> <li>(c) support the viability of identified centres.</li> </ul> <p>The Planning Proposal does not propose or affect any business or industrial zoned land.</p>	Consistent.
1.2 Rural Zones	<p>The objective of this direction is to protect the agricultural production value of rural land.</p> <p>This Planning Proposal seeks to rezone land from an existing rural zone to a residential zone. However, this inconsistency is considered to be justified for the following reasons:</p> <ul style="list-style-type: none"> <li>• The lands affected by the Planning Proposal are excluded from Regionally Significant farmland considerations and are recognised as a future residential growth area by the North Coast Regional Plan 2036.</li> <li>• The site has not been used for productive agricultural uses for a significant amount of time and therefore, the impact on the overall availability of rural lands for this purpose will be negligible.</li> <li>• The land is small in area and is inappropriately located for sustainable agriculture, given its proximity to adjacent residential land and its recognition as an urban investigation area by Council's LGMS 2008 and as a future residential growth area by the North Coast Regional Plan 2036.</li> </ul>	Justifiably inconsistent for reasons listed.
1.5 Rural Lands	<p>The objectives of this direction are to:</p> <ul style="list-style-type: none"> <li>(a) protect the agricultural production value of rural land,</li> <li>(b) facilitate the orderly and economic use and development of rural lands for rural and related purposes,</li> <li>(c) assist in the proper management, development and protection of rural lands to promote the social, economic and environmental welfare of the State,</li> </ul>	Justifiably inconsistent for reasons listed.



Ministerial Direction	Comments	Consistency with Direction
	<p>(d) minimise the potential for land fragmentation and land use conflict in rural areas, particularly between residential and other rural landuses,</p> <p>(e) encourage sustainable land use practices and ensure the ongoing viability of agriculture on rural land</p> <p>(f) support the delivery of the actions outlined in the New South Wales Right to Farm Policy.</p> <p>This direction applies as the Planning Proposal includes changes in existing rural zone boundaries and minimum lot sizes of rural zoned land.</p> <p>Land which is currently zoned RU2 Rural Landscape is proposed to be amended to Zone R2 Low Density Residential and Zone E3 Environmental Management.</p> <p>The land is identified in the <i>North Coast Regional Plan 2036</i> and <i>Council's Local Growth Management Strategy 2008</i> as within the urban growth area boundary and as an urban investigation area respectively.</p>	
<b>2 Environment and Heritage</b>		
2.1 Environment Protection Zones	<p><i>The objective of this direction is to protect and conserve environmentally sensitive areas.</i></p> <p>Areas of remnant native vegetation on the subject site will be rezoned from Zone RU2 Rural Landscape to Zone E3 Environmental Management in accordance with Practice Note PN 11-003 directions.</p> <p>An Ecological Constraints Analysis and a Targeted Survey Report for the Lesser Swamp Orchid (Appendix E) were prepared to inform the Planning Proposal. The ecological studies indicate that:</p> <ul style="list-style-type: none"> <li>• The site consists primarily of cleared land of low ecological value.</li> <li>• No lesser swamp orchid were located on the site or in the potential habitat surveyed on community land surrounding the site.</li> <li>• No potential habitat for the orchid was identified on site.</li> <li>• There are a few small patches, particularly on the edge of the project site containing areas of medium or high ecological value.</li> <li>• No Commonwealth or NSW threatened ecological communities are likely to occur within the project area and given that the site is mainly cleared and has low vegetation</li> </ul>	Consistent

Ministerial Direction	Comments	Consistency with Direction
	<p>values, it is unlikely to support a diversity of threatened fauna and flora species.</p> <ul style="list-style-type: none"> <li>Riparian areas should be maintained and improved and retention of areas of high ecological value should be included in forward planning for the project site.</li> </ul> <p>There is no high conservation value land within the site, therefore the E3, rather than the E2 zone is considered to be appropriate for those areas of remnant vegetation with biodiversity and habitat corridor value.</p> <p>This approach meets the intent of this direction by protecting land under the E3 zone without unnecessarily zoning land for environmental protection purposes that may not actually have significant environmental value.</p>	
2.2 Coastal Management	<p><i>The objective of this direction is to protect and manage coastal areas of NSW.</i></p> <p>The south eastern corner of the subject land is affected by the <i>Coastal Environment Area</i> which is one of four coastal management areas as defined under the <i>SEPP (Coastal Management) 2018</i>. The <i>Coastal Environment Area</i> identifies the environmental features of the coastal zone, such as state waters, estuaries, coastal lakes and coastal lagoons.</p> <p>Overall, the Planning Proposal is consistent with the aims and objectives of the <i>Coastal Management Act 2016</i>. It will not affect public access to the beaches and coastal foreshore areas or generate the need to provide new access; it will not result in adverse impacts upon the environmental assets of the coast; and will not increase future coastal risks to the Woolgoolga Lake Catchment. The Planning Proposal will not alter the relevance or effect the <i>Coastal Design Guidelines 2003</i>.</p> <p>At the development application stage, mitigative measures will be incorporated into the stormwater drainage design to ensure all runoff will have a nil or beneficial impact downstream. There is sufficient area within the subject land to accommodate this outcome.</p>	Consistent
2.3 Heritage Conservation	<p><i>The objective of this direction is to conserve items, areas, objects and places of environmental heritage significance and indigenous heritage significance.</i></p> <p>The applicant's consultants stated that they undertook a consultation process with the Aboriginal community in accordance with the (former) <i>OEH Aboriginal Cultural Heritage Consultation Requirements for Proponents (2010) (ACHCRP)</i> and</p>	Consistent

Ministerial Direction	Comments	Consistency with Direction
	<p>prepared an Aboriginal Cultural Heritage Assessment Report (Appendix D).</p> <p>The results of the Archaeological Assessment are summarised as follows:</p> <ul style="list-style-type: none"> <li>• A PAD was identified in the vicinity of the Project Area comprising a knoll to the west of the water storage dam however no Aboriginal objects were identified on the knoll. However, the presence of topsoil on the knoll provides an indication that there is the potential for an Aboriginal stone artefact scatter to occur on the knoll.</li> <li>• Having consideration for the landscape context of the Project Area and the history of disturbance it is considered unlikely that the Project Area will contain Aboriginal sites of high or moderate conservation value. The Project Area is unlikely to contain burials or middens and does not contain scarred or modified trees. Whilst some historic campsites are known in the general vicinity the site, none are known within the Project Area. No Mythological or ceremonial sites are known to occur within the Project Area, however it is noted that the ridge-crest may have been utilised as a pathway between the coast and hinterland.</li> </ul> <p>An onsite AHIP consultation meeting was held on 18<sup>th</sup> January 2018 with the applicant's cultural heritage consultant and members of the local Aboriginal community and the Coffs Harbour and District Local Aboriginal Land Council. According to the report (Appendix D), those present agreed that the rezoning would be acceptable.</p> <p>It is also appropriate that a Gateway Determination should require further consultation with local Aboriginal stakeholders and the NSW Department of Premier and Cabinet.</p>	
2.4 Recreation Vehicle Areas	<p><i>The objective of this direction is to protect sensitive land or land with significant conservation values from adverse impacts from recreation vehicles.</i></p> <p>This planning proposal does not enable land to be developed for the purpose of a recreation vehicle area.</p>	Consistent
<b>3. Housing, Infrastructure and Urban Development</b>		

Ministerial Direction	Comments	Consistency with Direction
3.1 Residential Zones	<p><i>The objectives of this direction are:</i></p> <ul style="list-style-type: none"> <li><i>(a) to encourage a variety and choice of housing types to provide for existing and future housing needs,</i></li> <li><i>(b) to make efficient use of existing infrastructure and services and ensure that new housing has appropriate access to infrastructure and services, and</i></li> <li><i>(c) to minimise the impact of residential development on the environment and resource lands.</i></li> </ul> <p>The Planning Proposal provides for an additional 8-9 hectares of R2 Zone Low Density Residential land under <i>Coffs Harbour LEP 2013</i>.</p> <p>The provision of additional Low Density Residential land will broaden lifestyle choices in a suitable location. The proposed minimum lot size is 400m<sup>2</sup> providing an opportunity for a variety of housing types.</p> <p>The residential land is located such that the full range of existing urban services can be readily extended to service the area. A preliminary Engineering Appraisal prepared by deGroot and Benson, Consulting Engineers (Appendix G) indicates that a low density residential subdivision of the land can be adequately serviced.</p> <p>The proposal will increase the supply of residential land adjoining other residential land, as well as land earmarked for public recreation.</p> <p>The conceptual subdivision master plan illustrates how a low density residential subdivision could be located within the site when considering the site's constraints and opportunities.</p> <p>Appropriate planning controls are also contained within <i>Coffs Harbour DCP 2015</i> to ensure that development within R2 Low Density Residential zoned land is of good design.</p>	Consistent
3.2 Caravan Parks and Manufactured Home Estates	<p><i>The objectives of this direction are:</i></p> <ul style="list-style-type: none"> <li><i>(a) to provide for a variety of housing types, and</i></li> <li><i>(b) to provide opportunities for caravan parks and manufactured home estates.</i></li> </ul> <p>This Planning Proposal is consistent with this direction. Caravan parks are permitted with consent in the R2 Low Density Residential zone under <i>Coffs Harbour LEP 2013</i>. There are no existing caravan parks located on the subject lands.</p>	Consistent

Ministerial Direction	Comments	Consistency with Direction
3.3 Home Occupations	<p><i>The objective of this direction is to encourage the carrying out of low-impact small businesses in dwelling houses.</i></p> <p>Home occupations are permitted without consent in both the R2 and E3 zone under <i>Coffs Harbour LEP 2013</i>. This Planning Proposal does not seek to alter those LEP provisions.</p>	Consistent
3.4 Integrating Land Use and Transport	<p><i>The objective of this direction is to ensure that urban structures, building forms, land use locations, development designs, subdivision and street layouts achieve the following planning objectives:</i></p> <ul style="list-style-type: none"> <li><i>(a) improving access to housing, jobs and services by walking, cycling and public transport, and</i></li> <li><i>(b) increasing the choice of available transport and reducing dependence on cars, and</i></li> <li><i>(c) reducing travel demand including the number of trips generated by development and the distances travelled, especially by car, and</i></li> <li><i>(d) supporting the efficient and viable operation of public transport services, and</i></li> <li><i>(e) providing for the efficient movement of freight.</i></li> </ul> <p>This Planning Proposal is consistent with the objectives of this direction. The introduction of a key sites clause will provide an opportunity for Council to strategically examine the area and prepare appropriate DCP provisions to provide for an efficient transport network in the area. Increasing residential development within an area served by an existing public road network will support the local school bus service and may lead to additional transport services in the area. Passive forms of transport will be improved through the provision of links and pathways to recreational areas, the Woolgoolga High School and the future West Woolgoolga Sports Complex situated immediately to the south of the subject land.</p>	Consistent
3.5 Development Near Regulated Airports and Defence Airfields	<p><i>The objectives of this direction are:</i></p> <ul style="list-style-type: none"> <li><i>(a) to ensure the effective and safe operation of regulated airports and defence airfields;</i></li> <li><i>(b) to ensure that their operation is not compromised by development that constitutes an obstruction, hazard or potential hazard to aircraft flying in the vicinity; and</i></li> <li><i>(c) to ensure development, if situated on noise sensitive land, incorporates appropriate mitigation measures so that the development is not adversely affected by aircraft noise.</i></li> </ul>	Consistent

Ministerial Direction	Comments	Consistency with Direction
	This planning proposal does not affect land within the vicinity of a regulated airport or defence airfield.	
3.6 Shooting Ranges	<p><i>The objectives are:</i></p> <p>(a) to maintain appropriate levels of public safety and amenity when rezoning land adjacent to an existing shooting range,</p> <p>(b) to reduce land use conflict arising between existing shooting ranges and rezoning of adjacent land,</p> <p>(c) to identify issues that must be addressed when giving consideration to rezoning land adjacent to an existing shooting range.</p> <p>This planning proposal does not affect, create, alter or remove a zone or a provision relating to land adjacent to and/ or adjoining an existing shooting range.</p>	Consistent
<b>4. Hazard and Risk</b>		
4.1 Acid Sulfate Soils	<p><i>The objective of this direction is to avoid significant adverse environmental impacts from the use of land that has a probability of containing acid sulfate soils.</i></p> <p>The subject site has a low risk of containing acid sulphate soils as the site includes land within Class 5 as shown on the acid sulphate soils risk maps.</p> <p>Future building envelopes are not expected to disturb potential Class 4 or 5 ASS. However, at the development application stage, any potential excavations, including earthworks associated with civil works would need to satisfy the ASS provisions of Coffs Harbour LEP 2013 (cl 7.1).</p> <p>For these reasons the provisions of the Planning Proposal that are inconsistent are considered to be “of minor significance”.</p> <p>An approval for a variation to this s117 Direction is considered to be reasonable under the circumstances.</p>	Justifiably inconsistent for reasons listed.
4.3 Flood Prone Land	<p><i>The objectives of this direction are:</i></p> <p>(a) to ensure that development of flood prone land is consistent with the NSW Government’s Flood Prone Land Policy and the principles of the Floodplain Development Manual 2005, and</p> <p>(b) to ensure that the provisions of an LEP on flood prone land is commensurate with flood hazard and includes consideration of the potential flood impacts both on and off the subject land.</p>	Consistent

Ministerial Direction	Comments	Consistency with Direction
	<p>The subject site is not located within the mapped 1:100 year ARI flood extent.</p>	
<p>4.4 Planning for Bushfire Protection</p>	<p><i>The objectives of this direction are:</i></p> <p>(a) <i>to protect life, property and the environment from bush fire hazards, by discouraging the establishment of incompatible land uses in bush fire prone areas, and</i></p> <p>(b) <i>to encourage sound management of bush fire prone areas.</i></p> <p>It is expected that Consultation will be undertaken with the NSW Rural Fire Service pending issue of the Gateway Determination. If this Planning Proposal is finalised, all future subdivision development application(s) will be required to comply with the 'specifications and requirements' of <i>Planning for Bush Fire Protection 2006</i> and associated documents.</p> <p>Future development applications for subdivision and/or special fire protection purposes involving bushfire prone land in the Planning Proposal area will be referred to the NSW Rural Fire Service as required under s100B of the <i>Rural Fires Act 1997</i>.</p> <p>The conceptual masterplan and Bushfire Report (see Appendix F) demonstrates that a low density residential subdivision designed to accommodate the site's topographical opportunities and constraints, incorporating a road network system where feasible, will provide suitable dwelling areas within all lots that are at or below BAL-29 construction level.</p>	<p>Referral to NSW Rural Fire Service is required prior to confirmation of consistency with this particular Direction.</p>
<p><b>5. Regional Planning</b></p>		
<p>5.1 Implementation of Regional Strategies</p>	<p><i>The objective of this direction is to give legal effect to the vision, land use strategy, policies, outcomes and actions contained in regional strategies.</i></p> <p>No Regional Strategy applies to the Coffs Harbour Local Government Area.</p>	<p>Consistent</p>
<p>5.4 Commercial and Retail Development along the Pacific Highway, North Coast</p>	<p><i>The objectives for managing commercial and retail development along the Pacific Highway are:</i></p> <p>(a) <i>to protect the Pacific Highway's function, that is to operate as the North Coast's primary inter- and intra-regional road traffic route;</i></p> <p>(b) <i>to prevent inappropriate development fronting the highway;</i></p> <p>(c) <i>to protect public expenditure invested in the Pacific Highway;</i></p>	<p>Consistent</p>

Ministerial Direction	Comments	Consistency with Direction
	<p>(d) to protect and improve highway safety and highway efficiency;</p> <p>(e) to provide for the food, vehicle service and rest needs of travelers on the highway; and</p> <p>(f) to reinforce the role of retail and commercial development in town centres, where they can best serve the populations of the towns.</p> <p>This proposal will not affect commercial and retail land along the Pacific Highway, North Coast.</p>	
5.10 Implementation of Regional Plans	<p><i>The objective of this direction is to give legal effect to the vision, land use strategy, goals, directions and actions contained in Regional Plans.</i></p> <p>The North Coast Regional Plan 2036 (NCRP) applies to the Coffs Harbour LGA. The NCRP includes actions on environmental, economic and social (community) opportunities, as well as maintaining character and housing.</p> <p>Specific responses to relevant strategic directions and the accompanying actions contained within the NCRP are provided in Part 3, Section A (3) and Section B (4) above. It is considered that the Planning Proposal will result in development that supports the intent of the above actions and is therefore considered to be consistent with the NCRP.</p>	Consistent
<b>6. Local Plan Making</b>		
6.1 Approval and Referral Requirements	<p><i>The objective of this direction is to ensure that LEP provisions encourage the efficient and appropriate assessment of development.</i></p> <p>The Planning Proposal does not include provisions that require the concurrence, consultation or referral of development applications to a Minister or public authority.</p> <p>It does not identify development as designated development.</p>	Consistent
6.2 Reserving Land for Public Purposes	<p><i>The objectives of this direction are:</i></p> <p>(a) to facilitate the provision of public services and facilities by reserving land for public purposes, and</p> <p>(b) to facilitate the removal of reservations of land for public purposes where the land is no longer required for acquisition.</p> <p>The Planning Proposal does not create, alter or reduce land reserved for a public purpose.</p>	Consistent



Ministerial Direction	Comments	Consistency with Direction
6.3 Site Specific Provisions	<p><i>The objective of this direction is to discourage unnecessarily restrictive site specific planning controls.</i></p> <p>The Planning Proposal includes a key sites clause and associated map, Land Zone Map and Lot Size Map to amend <i>Coffs Harbour LEP 2013</i>. Given that the Planning Proposal intends to rezone the subject land to an existing zone that already applies in an existing environmental planning instrument without imposing any development standards or requirements in addition to those already contained in the zone, the Planning Proposal is considered to be consistent with this Direction.</p>	Consistent

### Section C – Environmental, social and economic impact

#### 8. 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 Ecological Constraints Analysis and Targeted Survey Report for the Lesser Swamp Orchid (Appendix E) identifies important areas of remnant native vegetation proposed to be included in Zone E3 Environmental Management. Key ecological findings are summarised as follows:

- The subject land consists primarily of cleared land of low ecological value.
- There is no high conservation value land within the subject land.
- No lesser swamp orchid examples were located on the subject land, or in the potential habitat surveyed on community land surrounding the subject land.
- No potential habitat for the lesser swamp orchid was identified on the subject land.
- There are isolated locations, particularly on the edge of the project site containing areas of medium or high ecological value.
- No Commonwealth or NSW threatened ecological communities are likely to occur within the project area and as the site is mainly cleared and has low vegetation value, it is unlikely to support a diversity of threatened fauna and flora species.
- Riparian areas should be maintained and improved and areas of high ecological value should be retained and included in forward planning for the site.

The proposed E3 Environmental Management zone is considered appropriate for those areas of remnant vegetation with biodiversity and habitat corridor value. This approach protects land under the E3 zone without unnecessarily zoning land for environmental protection purposes that may not actually have significant environmental value.

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

The following is a summary of other likely environmental constraints associated with the Planning Proposal:

##### Flood Prone Land

All lands proposed to be zoned R2 Low Density Residential areas are located outside the mapped 1:100 year ARI flood extent.

### **Bushfire Risk**

Asset Protection Zones (APZs) for residential land are identified within the subject land. Where feasible, the conceptual road network adjoins the required APZs. Areas that will be rezoned for residential purposes under this Planning Proposal do not rely on the removal or modification of any significant or high value vegetation for bushfire management purposes. NSW Rural Fire Service are yet to provide comment on this Planning Proposal.

The Bushfire Risk has been addressed by Ecological Australia in their Bushfire Assessment. (See Appendix C).

### **Site Contamination**

A review of previous land uses of the site indicates that contamination of the site is unlikely. The land is not mapped as former banana cultivation land and past known land uses comprise low intensity stock grazing. Searches of the land contamination register, record of notices and contaminated sites notified to Environmental Protection Authority have not identified the subject land. Contamination potential is considered minimal and manageable with recognised remediation procedures available.

A preliminary site contamination investigation is included with this Planning Proposal (see Appendix I) which found that there were no exceedances of adopted assessment criteria and it is considered that there is a low potential for soil contamination to be present within the subject land.

### **Acid Sulfate Soils**

Council's mapping system indicates that the subject land is mapped as Class 5 Acid Sulfate Soils. Class 5 is the lowest risk class and therefore it is highly unlikely that development of the property into residential lots will disturb acid sulphate soils .

### **Indigenous Heritage**

A Potential Archaeological Deposit (PAD) was identified in the southern portion of the subject land comprising a knoll to the west of the water storage dam, although no Aboriginal objects were identified on the knoll. However, the presence of topsoil on the knoll provides an indication that there is the potential for an Aboriginal stone artefact scatter to occur. The knoll is proposed to be rezoned E3, therefore the PAD is unlikely to be disturbed.

The consultant report recommends that cultural heritage induction and the application of an Aboriginal Find Procedure is the appropriate level of management for work in the vicinity of the southern PAD. The full cultural heritage assessment is provided at Appendix D.

Given the above, it is considered appropriate that a Gateway Determination should require consultation with local Aboriginal stakeholders and the NSW Department of Premier and Cabinet.

## European Heritage

The subject site does not contain any items listed as Heritage Items in Schedule 5 of Coffs Harbour Local Environmental Plan 2013 or the State Heritage Register. There are no European Heritage issues that would prevent the rezoning of this site.

## Visual Amenity

Visual characteristics within the site range from small pockets of retained vegetation to cleared paddocks. The site has the capability to absorb visual change from rural to residential as it adjoins existing low density residential and large lot residential development.

Tree retention within the proposed E3 Environmental Management zone and the adjoining (existing) RE1 Public Recreation zoned land will provide some visual softening of future residential development and generally maintain the character of the area.

## 10. How has the Planning Proposal adequately addressed any social and economic effects?

Social and economic effects arising from the Planning Proposal will be positive in terms of the provision of land for new housing close to recreation land, the Woolgoolga State High School and urban facilities in Woolgoolga.

### Social Considerations

The subject land is a 'greenfield' development site of a similar character to other growth areas within the Coffs Harbour LGA. The social implications of rezoning the subject land to provide for residential development are envisaged to be positive. The interface between the site and surrounding existing residential development is suitably buffered by RE1 Public Recreation zoned land. Passive connections between the subject land and the RE1 zoned land will occur over time as the nearby sporting fields and pedestrian/cycleway connections are built. The likely population of the subject land once developed (82 lots x 2.3 people) is estimated to be 190 persons. There are adequate services available in the Woolgoolga area to cater for a gradual growth of population.

Eventual housing resulting from the rezoning is likely to have a positive impact on the Woolgoolga community in terms of the provision of affordable housing, strengthening of existing community, commercial and retail services. Similarly, the development of the Northern Beaches Multi-Purpose Centre and West Woolgoolga Sports Complex that are located in between the two planning proposal areas will complement the growth of the Woolgoolga North West urban investigation area and provide important community facilities.

### Economic Issues

A detailed Residential Land Demand Analysis was prepared to inform this Planning Proposal. The full report is included as Appendix B and the findings are summarised below:

- *There are numerous factors driving the demand for new residential development and the demand for detached housing lots within the Woolgoolga area including:*
  - *Low interest rates and the availability of finance,*
  - *Improved employment prospects and labour markets within the Coffs Harbour region,*
  - *Affordable housing options relative to other major markets along Australia's east coast; and*
  - *A fundamentally solid rental market which is attractive for residential property investment.*
- *Residents of the Study Area (an area from Red Rock to Emerald each and west to Upper Corindi) community have a propensity of demand for affordable detached housing for families, but also a choice in residential product catering to retirees, older persons and other more compact households.*

- *Based on population growth alone, the Woolgoolga Study Area is projected to require an additional 2,600 dwellings between 2017 and 2036 or more than 130 new dwellings per annum over this period. A significant share of this dwelling demand will continue to be directed to detached dwellings and therefore demand for residential lots.*
- *The residential market in Coffs Harbour and the Study Area is demonstrating a supply-led market including signs of decreasing affordability and more limited choice in available residential product. It is important to ensure the timely delivery of residential land to maintain confidence in the residential market and in the ongoing delivery of affordable residential lifestyles for the Coffs Harbour community. A 7 to 8 year lead time is critical in ensuring sufficient residential land supply is available in maintaining affordability and confidence in the local residential market.*
- *Underlying demand drivers are indicative of increasing population growth and demand for residential lifestyles in Coffs Harbour and the Study Area, bringing forward population projections and dwelling demand within the Study Area.*
- *It is estimated that there is only three years of supply available to the market within the Study Area, including land that is currently not being developed and subject to landowner intentions and commercial viabilities, indicative of a pressing need for release of land to maintain affordability and confidence in the market.*

The Residential Land Demand Analysis suggests that rezoning the subject land for residential purposes will assist in meeting current demand for additional low density residential land stock in the Woolgoolga locality.

## **Section D – State and Commonwealth interests**

### **11. Is there adequate public infrastructure for the Planning Proposal?**

Reticulated water supply and sewerage are available to service the Woolgoolga North West Investigation Area. Although insufficient capacity exists at the moment, there are planned upgrades to the network that will be able to service future residential development. Masterplanning of the Woolgoolga North West urban investigation area will provide guidance to potential developers on this issue. Electricity and telecommunications infrastructure is also available to the subject land.

The site has frontage to Newmans Road Woolgoolga, which is an existing collector road that services a growing urban area. The Traffic Assessment (refer to Appendix H) and subsequent amendments indicate that the eventual development of the site will not compromise traffic flow and the safe passage of traffic in and out of the West Woolgoolga area.

Council intends to undertake a broader traffic assessment and traffic modelling exercise as part of the master planning of the Woolgoolga North West urban investigation area to provide an optimal arrangement for traffic movement in the area. A broader traffic assessment will consider:

- the developing West Woolgoolga area surrounding the subject land;
- the desire for east-to-west pedestrian / bicycle connectivity across Solitary Islands Way (SIW) to connect Woolgoolga High School and the existing cycleway (on the east side of SIW) to the proposed West Woolgoolga Playing fields and the future Woolgoolga North West growth area on the west side
- the need for multiple intersection upgrades and new intersections along SIW in association with current growth and future growth areas and the need to access the proposed West Woolgoolga Playing fields.

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

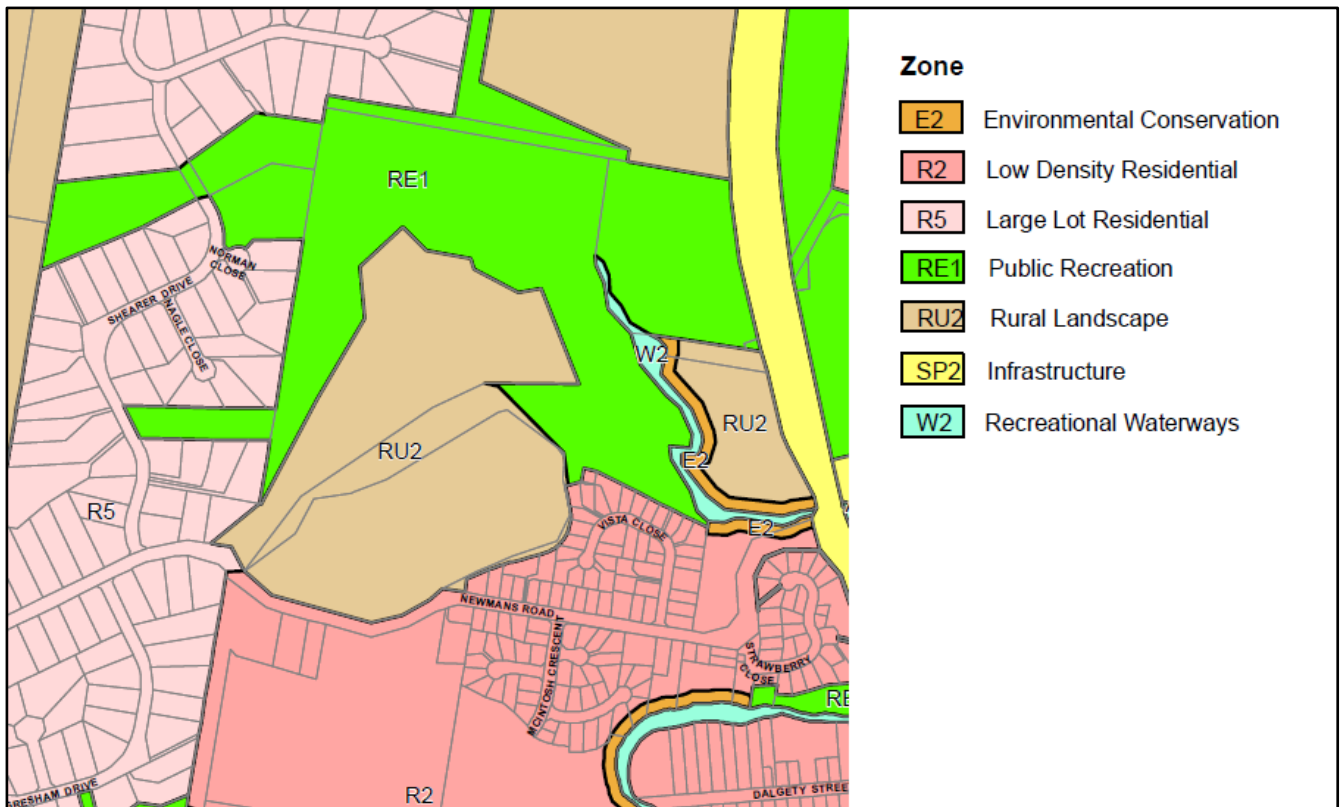
This will be determined following additional consultation with any State and Commonwealth Public Authorities as identified in a Gateway Determination issued by NSW Department of Planning, Industry and Environment.

## PART 4 – MAPPING

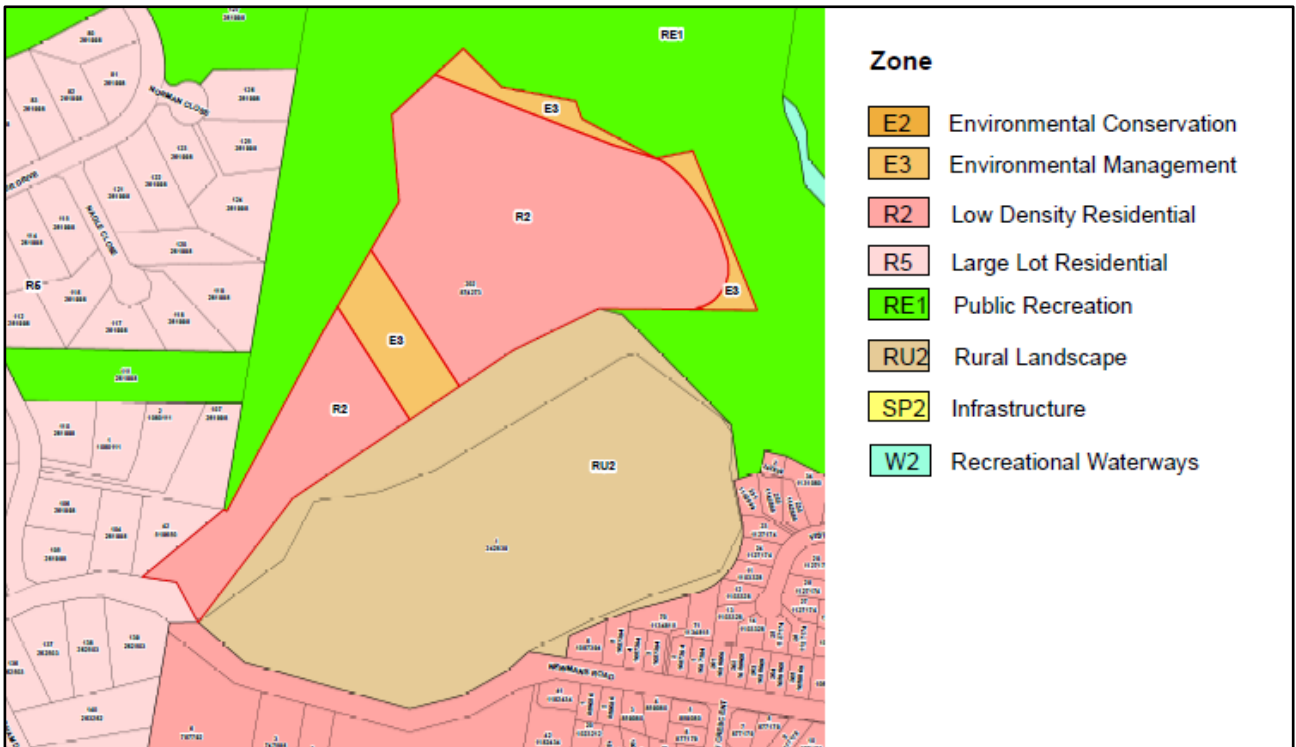
The following amendments are proposed to Coffs Harbour LEP 2013 maps:

- Amend the Coffs Harbour Land Zoning Map (Sheet LZN\_005F) over Part Lot 202 DP 874273, Newmans Road, Woolgoolga to show land currently zoned RU2 Rural Landscape to part R2 Low Density Residential and part E3 Environmental Management;
- Amend the Coffs Harbour Minimum Lot Size Map (Sheet LSZ\_005F) over Part Lot 202 DP 874273, Newmans Road, Woolgoolga to show land currently subject to minimum lot size provision AB – 40ha to part AB – 40ha and part F – 400 sqm;
- Amend the Coffs Harbour Terrestrial Biodiversity Map (Sheet CL2\_005F) over Part Lot 202 DP 874273, Newmans Road, Woolgoolga to include areas proposed to be zoned E3 Environmental Conservation as terrestrial biodiversity on the map; and
- Introduce a new Coffs Harbour Key Sites Map (KYS\_005F).

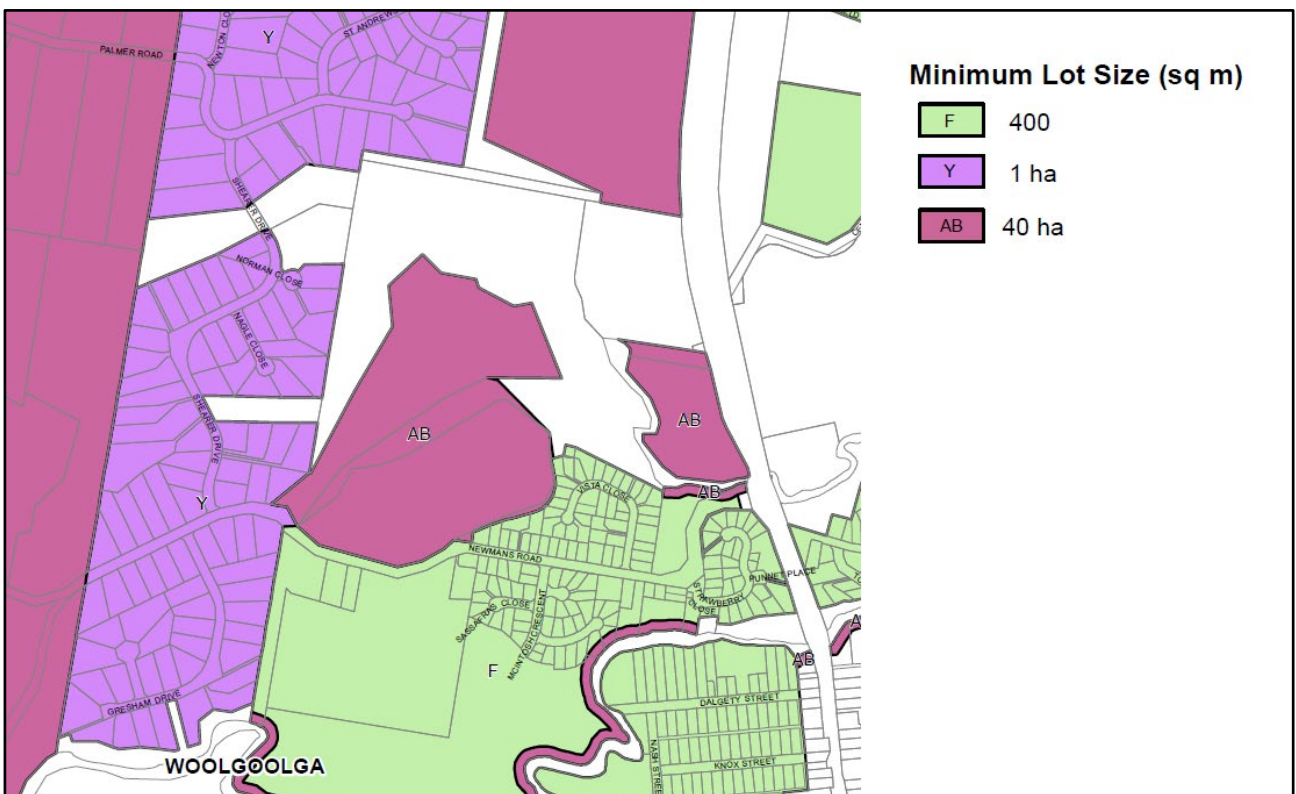
Existing mapping and proposed LEP mapping amendments are shown below:



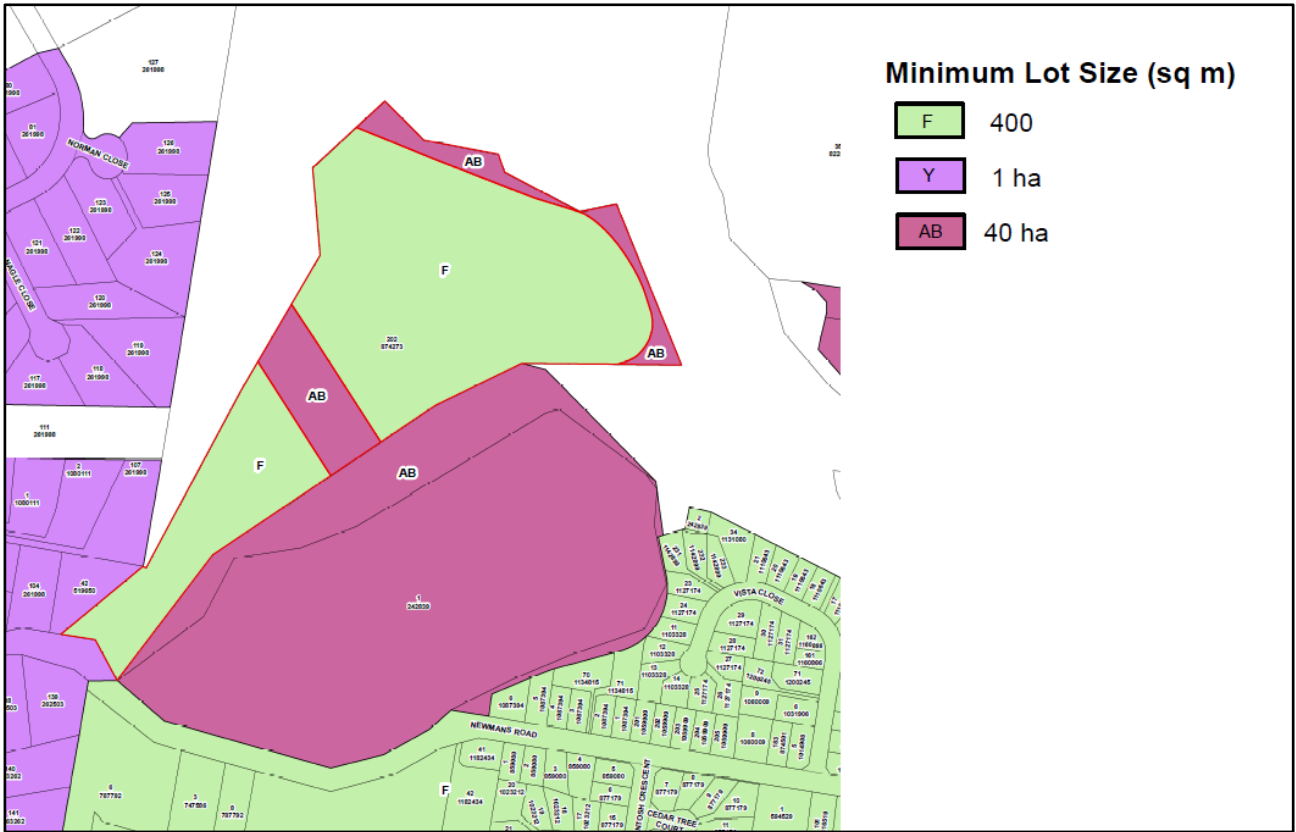
### Existing LEP 2013 Zones



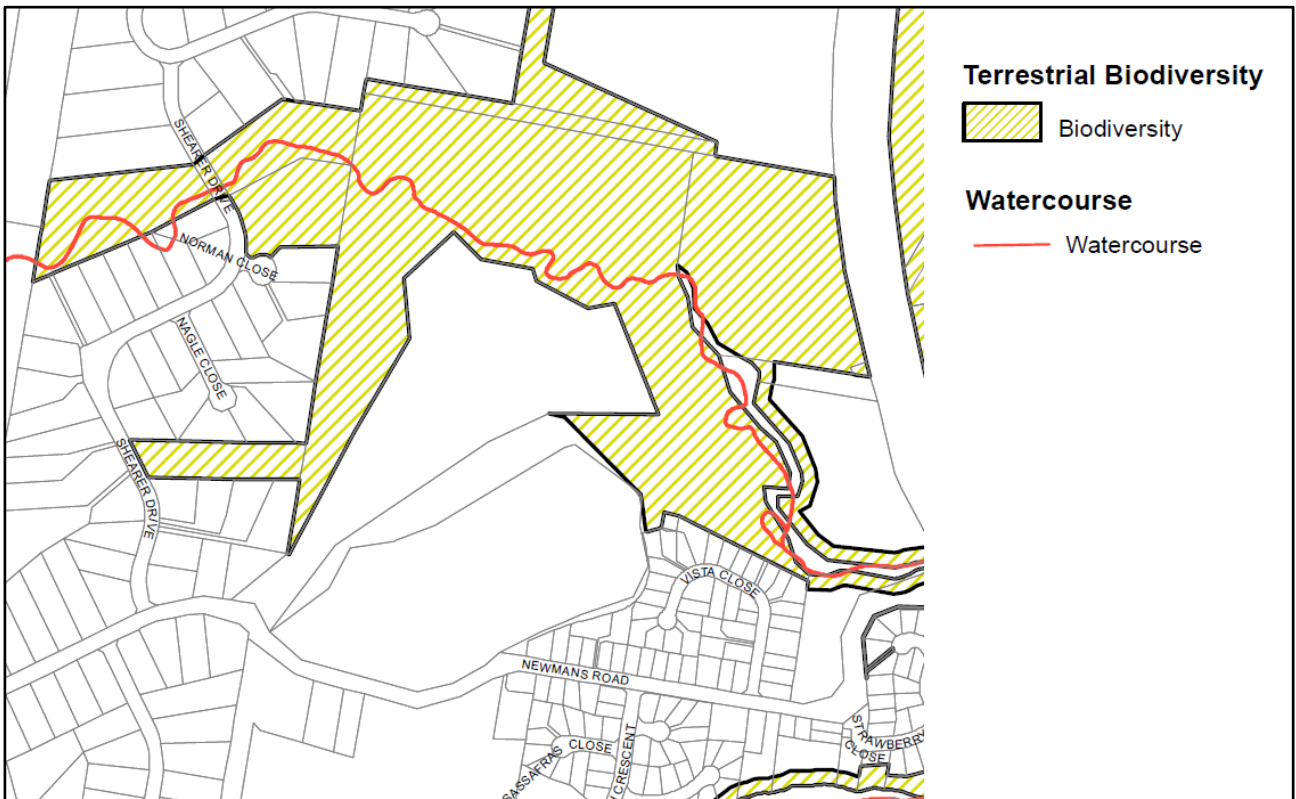
**Proposed LEP 2013 Zones**



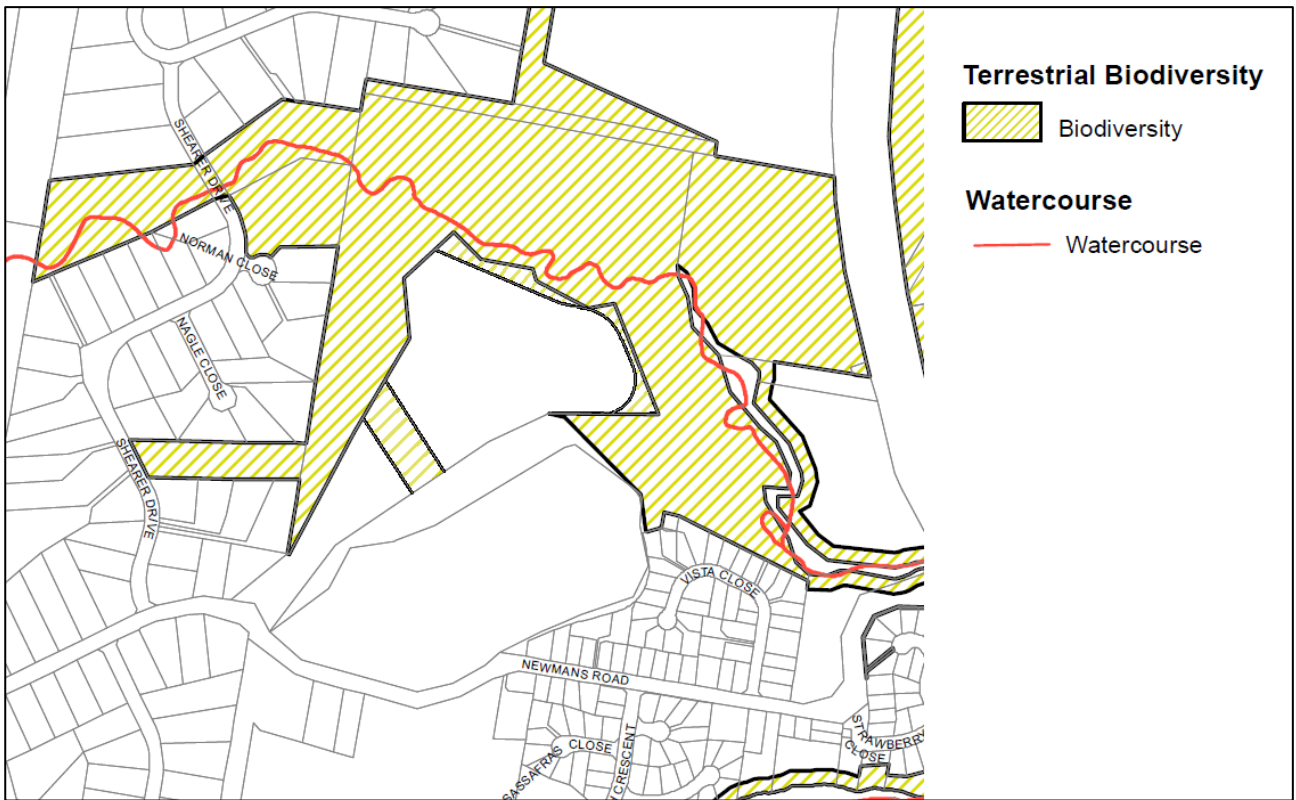
**Existing LEP 2013 Minimum Lot Sizes**



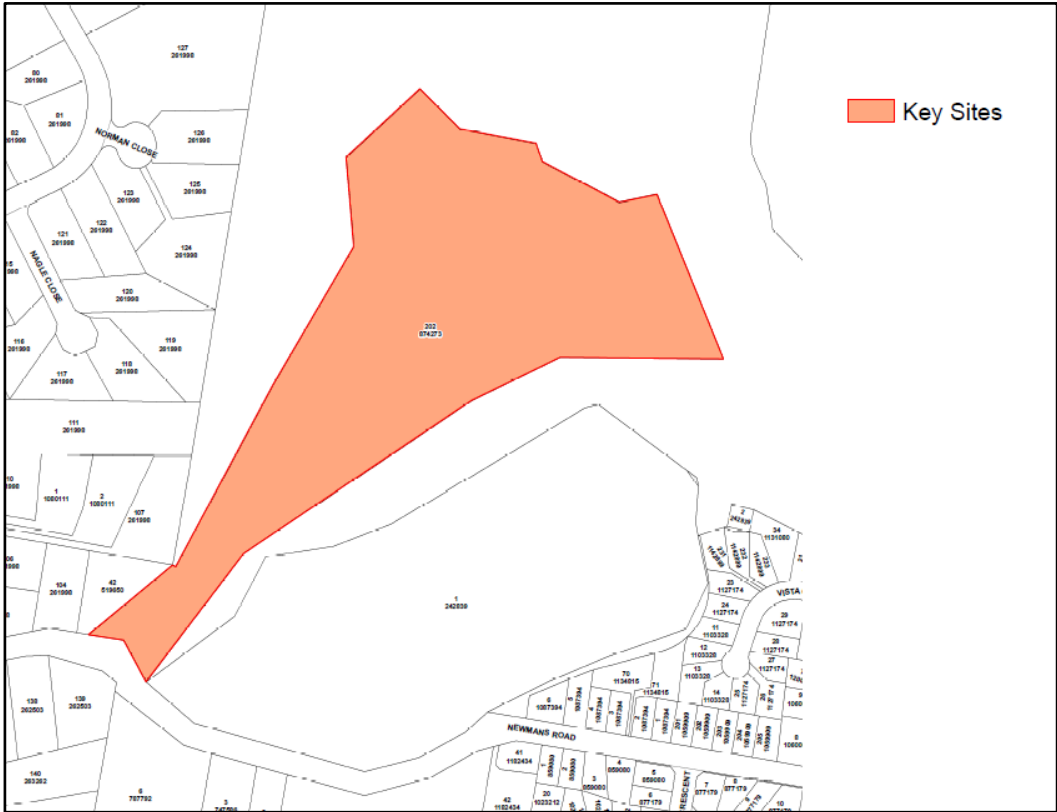
**Proposed LEP 2013 Minimum Lot Sizes**



**Existing Terrestrial Biodiversity Map**



**Proposed Terrestrial Biodiversity Map**



**Proposed Key Sites Map**



## PART 5 – COMMUNITY CONSULTATION

---

Should the NSW Department of Planning, Industry and Environment endorse exhibition of this Planning Proposal and issue a Gateway Determination, the community, government agencies and other stakeholders will have an opportunity to make submissions to this Planning Proposal.

If endorsed to do so, the Planning Proposal will be exhibited in accordance with the Gateway Determination and relevant provisions of Section 3.34(2) of the *Environmental Planning and Assessment (EP&A) Act 1979*.

## PART 6 – INDICATIVE TIMETABLE

---

The indicative timeframe for this Planning Proposal is outlined in table 3 below.

*Table 3: Indicative timetable*

<b>Task</b>	<b>Estimated timeframe</b>
Resolution by CHCC to proceed	September 2019
Gateway determination	October 2019
Finalisation of additional information as requested by Council and Gateway determination	October 2019
Public exhibition of Planning Proposal	November - December 2019
Agency consultation	November - December 2019
Review submissions	December 2019 - January 2020
Report to Council	February 2020
Submission to Planning Minister	March 2020
Finalisation	April - May 2020

## **APPENDICES**

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**APPENDIX A** – Landscape Character and Conceptual Master Plan and Subdivision

**APPENDIX B** – Residential Land Demand Analysis

**APPENDIX C** – Preliminary Vegetation Management Plan

**APPENDIX D** – Aboriginal Cultural Heritage Assessment Report

**APPENDIX E** – Lesser Swamp Orchid Report and Ecological Report

**APPENDIX F** – Bushfire Report

**APPENDIX G** – Engineering Appraisal

**APPENDIX H** – Traffic Assessment and Addendums

**APPENDIX I** – Preliminary Site Contamination Assessment





scattered trees and grassland within the site



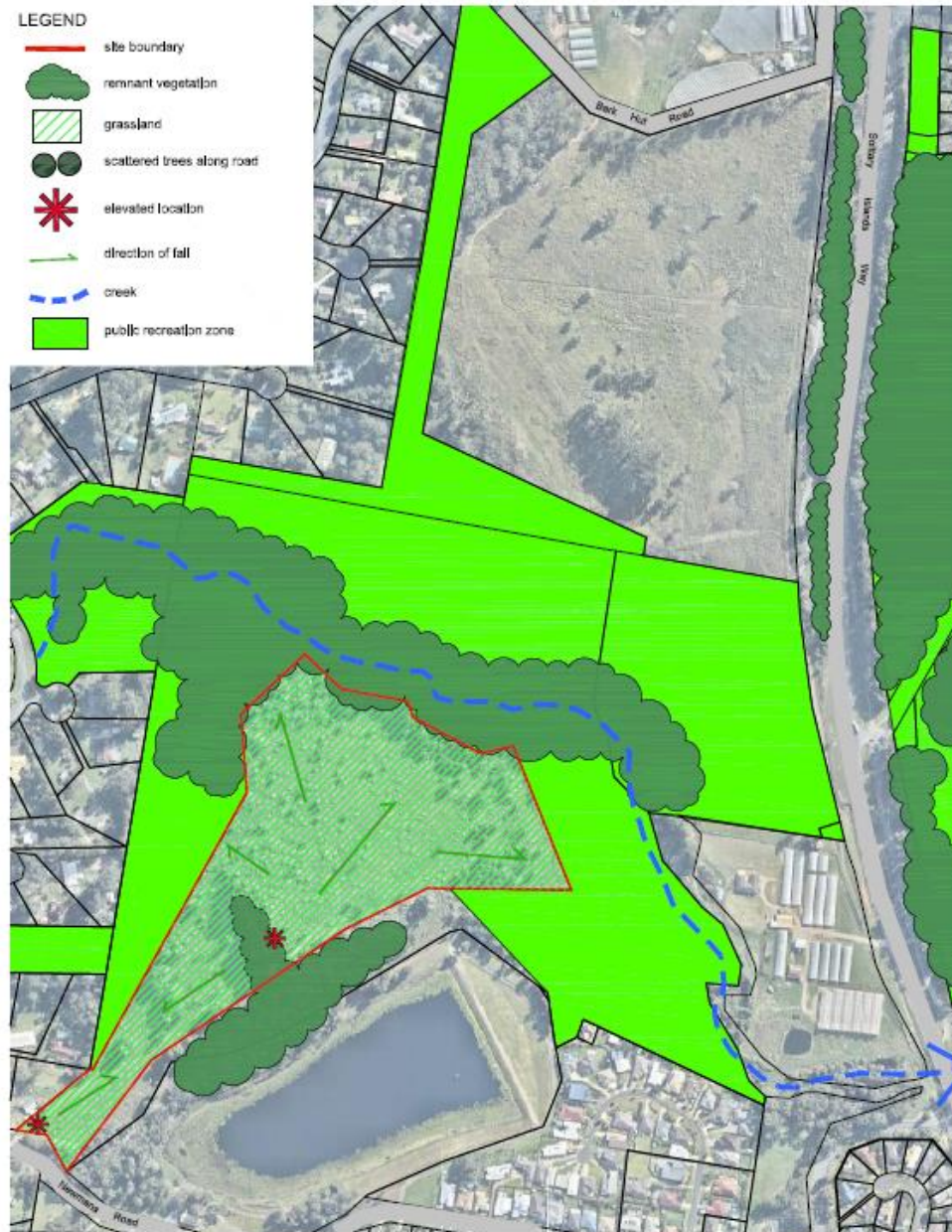
sample of scattered trees in the southwest of the site



creek and riparian vegetation (between the site and public recreation area)

LEGEND

- site boundary
- remnant vegetation
- grassland
- scattered trees along road
- elevated location
- direction of fall
- creek
- public recreation zone



Use figure dimensions in preference to scales.  
Please verify the Landscape Architect before  
proceeding if any anomaly is found between  
the drawing and conditions on file.  
This drawing must not be relied upon for any  
purpose other than that for which it was  
prepared or for any purpose or occasion other  
than that referred to.

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AMENDMENTS

Issue	Date	Details	Initials
1	25/01/18	Client review standing proposal	JA
2			JA

PROJECT  
Bark Hut Road, Woolgoolga  
PLANNING PROPOSAL  
CLIENT  
Kelley Hunter Urban Planner

DRAWING  
Planning Proposal  
Site Character  
DRAWING NO.  
1730-03

DRAWN  
JA  
ISSUE  
B  
DATE  
September 2018



Scale 1:5000 @ A3  
metres 0 20 40 60 80 100 120

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**LEGEND**

- site boundary
- - - creek
- remnant vegetation
- public recreation zone

Use figure drawings in preference to words. Please only the landscape architect's name should be used in any agreement to be found between this drawing and conditions on file. This drawing must not be relied upon for any purpose other than that for which it was prepared or for any purpose or corporation other than the intended client.

AMENDMENTS			
Issue	Date	Details	Initial
1	20/09/18	Site plan	JA
2	21/09/18	Site plan	JA

<b>PROJECT</b> Bark Hut Road, Woolgoolga <b>PLANNING PROPOSAL</b>	<b>DRAWING</b> Planning Proposal Site Context <b>DRAWING NO.</b> 1730-01	<b>DRAWN</b> JA	<b>ISSUE</b> B
<b>CLIENT</b> Kelley Hunter Urban Planner		<b>DATE</b> September 2018	

<b>Scale</b> 1:5000 @ A3 0 25 50 75 100 125	
---	--

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PHOTO 1 - looking across dam from Newmans Road to site



PHOTO 2 - looking to creek from the site



PHOTO 3 - entry to site from Newmans Road



PHOTO 4 - view from site looking east



PHOTO 5 - view from site looking south

Use figure dimensions in preference to scales.  
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AMENDMENTS

Issue	Date	Details	Initial
A	22/2/18	Client review	JA
B	11/4/18	Client proposal	JA

PROJECT  
Bark Hut Road, Woolgoolga  
PLANNING PROPOSAL  
CLIENT

Kelley Hunter Urban Planner

DRAWING  
Planning Proposal  
Views to the Site  
DRAWING NO.

1730-02

DRAWN  
JA  
DATE

September 2018







ISSUE  
A

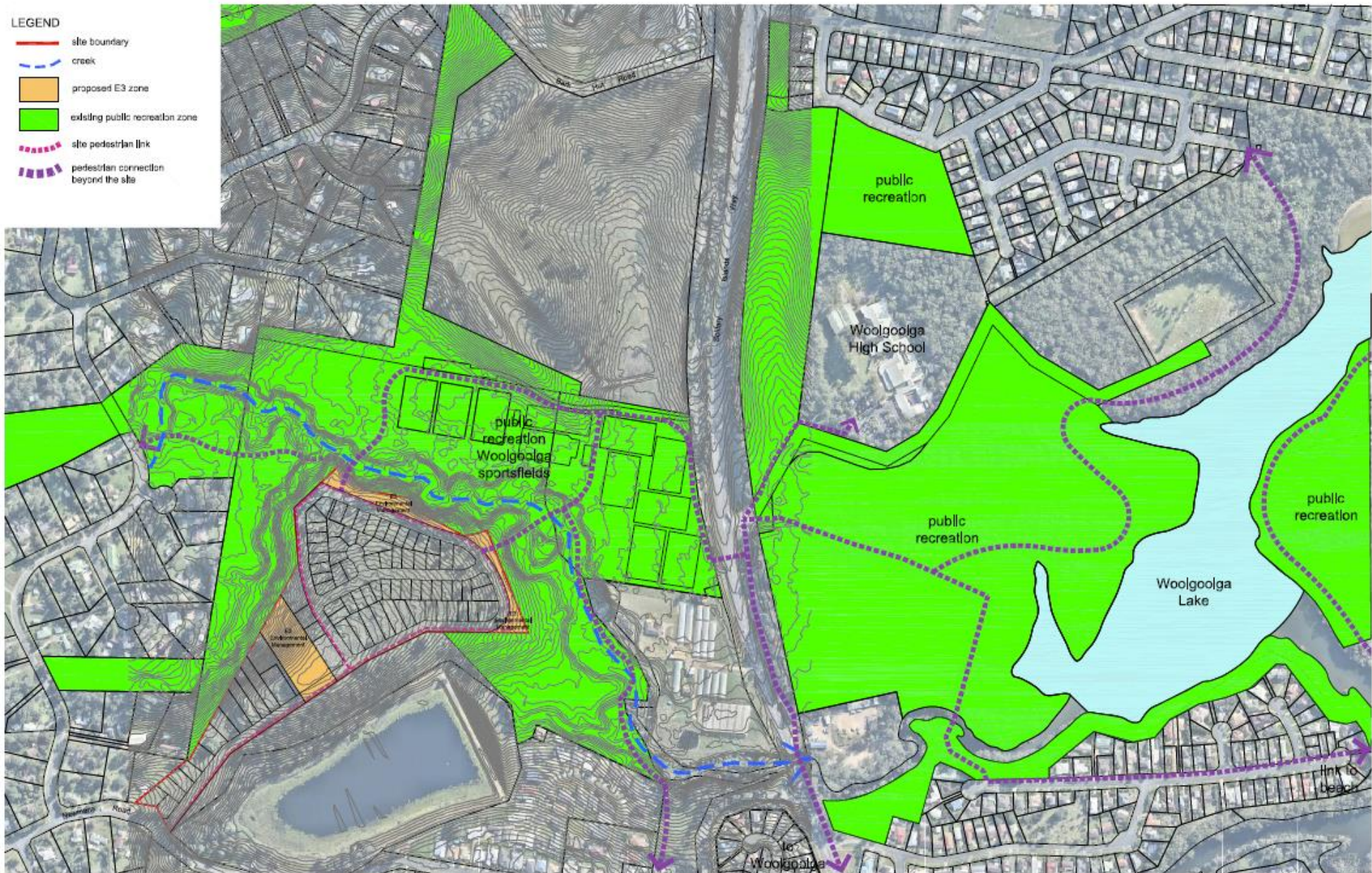


Scale 1:2000 @ A3  
metres 0 25 50 75 100 125

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- LEGEND**
-  site boundary
  -  creek
  -  proposed E3 zone
  -  existing public recreation zone
  -  site pedestrian link
  -  pedestrian connection beyond the site



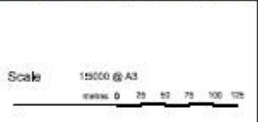
Use figures and drawings in preference to tables. Please notify the Landscape Architect before proceeding if any anomaly is found between the drawings and corresponding tables. This drawing must not be relied upon for any purpose other than that for which it was prepared or by any person or organisation other than the relevant client.

AMENDMENTS			
Issue	Date	Details	Initials
A	25/2/18	Client review	JA
B	21/3/18	Layout updated	JA
C	11/4/18	Client approved	JA

**PROJECT**  
Bark Hut Road, Woolgoolga  
**PLANNING PROPOSAL**  
**CLIENT**  
Kelley Hunter Urban Planner

**DRAWING**  
Planning Proposal  
Open Space Masterplan  
**DRAWING NO.**  
1730-07

**DRAWN**  
JA  
**ISSUE**  
C  
**DATE**  
September 2018



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AMENDMENTS		
Issue	Date	Details
A	25/4/18	Client review
B	11/5/18	amended for Asset Protection Zones
C	11/5/18	amended as per DDB feedback
D	3/4/18	E3 zone added
E	11/5/18	planning proposal

<b>PROJECT</b>	Bark Hut Road, Woolgoolga
<b>PLANNING PROPOSAL</b>	Proposed Subdivision Layout Newmans Rd
<b>CLIENT</b>	Kelley Hunter Urban Planner

<b>DRAWING</b>	Planning Proposal Proposed Subdivision Layout Newmans Rd
<b>DRAWING NO.</b>	1730-06

<b>DRAWN</b>	JA
<b>ISSUE</b>	E
<b>DATE</b>	September 2018



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# Appendix B ~ Woolgoolga Residential Demand Analysis





*Subject site looking south from Bark Hut Rd*

## Residential Land Demand Analysis: Bark Hut Road, Woolgoolga



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Prepared on behalf of:

Vadejil Pty Ltd

Prepared by:

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Joshua Binkley  
*Consultant*

*January 2018 Update*

16069

**Warranty**

This report has been based upon the most up to date readily available information at this point in time, as documented in this report. Urban Economics has applied due professional care and diligence in accordance with generally accepted standards of professional practice in undertaking the analysis contained in this report from these information sources. Urban Economics shall not be liable for damages arising from any errors or omissions which may be contained within these information sources.

As this report involves future market projections which can be affected by a number of unforeseen variables, they represent our best possible estimates at this point in time and no warranty is given that this particular set of projections will in fact eventuate.

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## EXECUTIVE SUMMARY

- A masterplan has been prepared for the establishment of a 293-lot residential development on Bark Hut Road, Woolgoolga. The location has been investigated for residential development since the mid-1990's and it is now considered suitable to progress development at the site. Lots are estimated to be on average 600m<sup>2</sup>, and to potentially include a range of lot sizes accommodating choice in dwelling types and promoting affordability.
- There are numerous factors driving the demand for new residential development and the demand for detached housing lots within the Woolgoolga area including:
  - Low interest rates and the availability of finance,
  - Improved employment prospects and labour markets within the Coffs Harbour region,
  - Affordable housing options relative to other major markets along Australia's east coast; and
  - A fundamentally solid rental market which is attractive for residential property investment.
- Residents of the Study Area community have a propensity of demand for affordable detached housing for families, but also a choice in residential product catering to retirees, older persons and other more compact households.
- Based on population growth alone, the Woolgoolga Study Area is projected to require an additional 2,600 dwellings between 2017 and 2036 or more than 130 new dwellings per annum over this period. A significant share of this dwelling demand will continue to be directed to detached dwellings and therefore demand for residential lots.
- The residential market in Coffs Harbour and the Study Area is demonstrating a supply-led market including signs of decreasing affordability and more limited choice in available residential product. It is important to ensure the timely delivery of residential land to maintain confidence in the residential market and in the ongoing delivery of affordable residential lifestyles for the Coffs Harbour community. A 7 to 8 year lead time is critical in ensuring sufficient residential land supply is available in maintaining affordability and confidence in the local residential market.
- Underlying demand drivers are indicative of increasing population growth and demand for residential lifestyles in Coffs Harbour and the Study Area, bringing forward population projections and dwelling demand within the Study Area.
- It is estimated that there is only 3years of supply available to the market within the Study Area, including land that is currently not being developed and subject to owner intents and commercial viabilities, indicative of a pressing need for release of land to maintain affordability and confidence in the market.

# 1.0 INTRODUCTION

## 1.1 BACKGROUND

A masterplan has been prepared for the establishment of a 293-lot residential development on Bark Hut Road, Woolgoolga. The location has been investigated for residential development since the mid-1990's and it is now considered suitable to progress development at the site.

Coffs Harbour City Council's Our Living City Settlement Strategy has identified the two land parcels within the possible Future Urban Investigation area, and has stated that it requires "an extremely compelling case to justify Council amending the priority" of the demand for residential land within the Woolgoolga area.

This Residential Land Demand Analysis has been undertaken by Urban Economics on behalf of Vadejil Pty Ltd, to comprehensively address the concerns and issues raised by Council regarding this development examining demand for residential land relative to existing and intended supply.

Urban Economics is a specialist economic and market research consultancy, with considerable experience in examining need and demand for the residential sector including masterplanned residential communities, worker's villages, rural residential and rural living developments, apartments, retirement and aged care, student accommodation and affordable housing.

## 1.2 STUDY OBJECTIVES AND METHODOLOGY

The key objective of this Analysis is to examine the need and demand for residential land in Woolgoolga and the relative position of the subject development within this supply and demand framework. A secondary objective will consider the proposed timing of the development as this relates to Council's strategy.

In meeting these objectives, Urban Economics has undertaken the following tasks:

- Inspected the subject properties and reviewed the masterplan for the proposed development;
- Identified existing estates currently selling within the Woolgoolga area, including an assessment of take-up rates, target markets and future supply;
- Reviewed historic aerial photography to critique take-up of residential land in Woolgoolga;
- Developed a Study Area for the proposed development and subject sites;
- Analysed historic population growth within Woolgoolga and the Coffs Harbour region;
- Conducted a series of interviews with local estate agents to explore key target markets for vacant land, key release areas, demand requirements of buyers and expectations etc;
- Prepared estimates of existing population and dwellings within the Woolgoolga area;

- Reviewed projections of the growth of the population of Woolgoolga;
- Analysed vacant residential land sales activity and median sales prices for vacant residential land within Woolgoolga;
- Reviewed the relevant planning and economic strategy framework for Coffs Harbour and the Woolgoolga local area;
- Critiqued other trends influencing the residential property market in Woolgoolga including infrastructure, employment, economic development and demographic trends;
- Analysed the supply-demand interplay within Woolgoolga and implications for the release of additional residential land;
- Analysed qualitative demand issues that may influence the demand for the subject development; and
- Critiqued economic and social benefits of the proposed residential estate.

## 2.0 THE PROPOSED DEVELOPMENT

### 2.1 PLANNING FRAMEWORK AND BACKGROUND

The planning framework for residential development within Coffs Harbour is guided by numerous documents and strategies. The following summarises the key planning and strategic documents relevant to the subject development in Woolgoolga and residential land supply.

#### **Mid North Coast Regional Strategy 2009**

The **Mid North Coast Regional Strategy 2009** outlines the development regulations and guidelines for the mid North Coast regional area to best accommodate the projected housing needs from 2006-31. The plan places restrictions on growth in areas where environmental and/or cultural importance is high. It also encompasses guidelines to provide sufficient employment opportunities for new jobs expected to hit the region in this time frame. The Strategy uses a population projected increase of around 91,000 with a reasonable amount deriving from Coffs Harbour, Port Macquarie, and Great Lakes/Taree. The Strategy also attempts to accommodate for the ageing population. It predicts that the area will need almost 60,000 new dwellings (Coffs Coast making up around 19,000 of these) to accommodate population growth, the ageing population, declining occupancy rates, and tourism demands. To achieve this, the Strategy suggests an increase in the proportion of multiunit dwellings by 20%.

The overarching goal of the Strategy is to *“maintain and enhance the opportunity for the communities of the Region to experience a healthy, prosperous and sustainable lifestyle.”*

#### **Draft North Coast Regional Plan**

The **Draft North Coast Regional Plan** develops a strategy for the Mid and Far North Coast for the next 20 years to provide *“a sustainable future for the region as it grows that protects the environment, builds a prosperous community and offers attractive lifestyle choices for residents.”* The primary focus is on Port Macquarie, Coffs Harbour and Tweed Heads regions. This Plan outlines guidelines for accommodating the ageing population and improving the affordability of the area. This Plan projects a population increase of just under 100,000, with 67% of growth stemming from the three regions above. 90% of the population growth is expected to be derived from people over 65 years of age.

This is a significant weighting of the Region’s population with considerable implications for housing and lifestyle delivery, as well as the mix of services and facilities available to the community.

The Regional Plan outlines 5 goals to achieve the above measures:

- 1) Protecting the natural environment and cultural heritage



- 2) Developing and maintaining an enjoyable area to work and live through growth opportunities
- 3) Meeting the housing needs of the changing population
- 4) Maintaining a well-performing economy with infrastructure and services
- 5) Updating freight patterns and transport connectivity

### **Coffs Harbour Local Environment Plan 2013 (LEP)**

The **Coffs Harbour LEP 2013** provides “*local environmental planning provisions for land in Coffs Harbour in accordance with the relevant standard environmental planning instrument under Section 33A*” of the Environmental Planning and Assessment Act. The LEP hopes to encourage sustainable economic growth and development in the Coffs Harbour region. Other relevant aims include:

- development of a liveable urban sector that offers a combination of residential dwellings to meet the diverse needs of the population
- sustainable conservation and management of the region’s natural environment and culture
- protection of especially valuable scenic and recreational areas
- ecologically sustainable development and limited exposure to natural hazards

### **Coffs Harbour Development Control Plan 2015 (DCP)**

The **Coffs Harbour DCP 2015** complements the LEP 2013 detailed above, as such to “*give effect to the aims of the Coffs Harbour LEP 2013, to facilitate development that is permissible under the Coffs Harbour LEP 2013 and achieve the objectives of land use zones under the Coffs Harbour LEP 2013.*” The DCP outlines 4 main objectives to achieve this goal:

- 1) Environmental Sustainability
  - Protection of high conservation value land and environmental heritage
  - Implementation of water-sensitive designs and minimisation of waterway impacts
  - Adherence to environmental characteristics of land
- 2) Social Sustainability
  - Meeting of needs of the population, including housing, leisure, and community facilities
  - Improving public transport, cycling paths, and walkways to minimise car dependence
- 3) Civic Leadership
  - Transparent, consistent, and accountable development proposals
- 4) Economic Sustainability
  - Contribution to economic growth and local employment opportunities
  - Sufficient support for public utilities and facilities so as to not burden the existing community

## **Coffs Harbour City Revised Land Capacity Assessment 2004**

The **Coffs Harbour City Revised Land Capacity Assessment** estimates Coffs Harbour LGA's total population capacity and land availability for existing and future lands as of December 2004. As of 2004, the region was expected to need to accommodate for 32,000 new residents by 2030. Most of those were considered to be accommodated by subdivided vacant lots or unsubdivided land, but at least 6,000 of those require new urban zones. The entire LGA is predicted to increase by nearly 34,000, and in Woolgoolga, population is expected to increase by 3,550, while dwellings are expected to increase by 1,574 by 2031 (with an occupancy rate of 2.3). However, the Assessment notes that Woolgoolga Sewage Treatment Plant is capped to service 18,000 people unless augmented. Most of Woolgoolga's needs are to be met with vacant lots, unsubdivided land, and potential residential land and infill development. Possible future urban investigation amounts to 475 people and 190 dwellings.

## **Local Growth Management Strategy (LGMS) Review Stage 1 - Land Capacity Assessment Audit**

The **LGMS Review Stage 1** of 2014 provides data on land capacity and supply of land *"to aid in the making of good planning decisions into the future for large lot residential, residential, business, industrial and tourist purposes"* as part of a review of the 2007 LGMS. According to the LGMS Review based on real estate responses, there is an adequate 5-year supply of land available for all of these categories (with the exception of residential land which did not have a clear agreement) in the northern part of the LGA, which centres on Woolgoolga. In the entire LGA, the audit indicates that there is significant land stock to accommodate future residential dwellings, especially where there is undeveloped land in Woolgoolga, West Coffs, North Boambee Valley, and South Coffs Harbour. R2 low density residential land can accommodate 2,970 more dwellings, while R3 medium density and R4 high density residential land can accommodate 899 more dwellings.

## **Our Living City Settlement Strategy**

The **OLC Settlement Strategy** outlines guidelines for future urban rezoning in the LGA until 2031. This Strategy bases its plan off an expected population projection of 99,000 by 2031. The goal is to *"provide a blueprint for a smart city with accessible and reliable transport, a strong regional economy, a vibrant community and a healthy natural environment for us all."* The OLC Settlement Strategy has three objectives:

- 1) The Healthy City: Environmental Sustainability
  - Conservation of natural resources
  - Enhancement of natural values and accountability for environmental constraints
  - Efficient resource use and minimisation of negative externalities
- 2) The Smart City: Economic Sustainability
  - Augmentation of growth and development
  - Advancing employment and educational opportunities
  - Management of the population size to sufficiently sustain and advance services

### 3) The Cultural City: Social Sustainability

- Improvement of liveability and identity of communities
- Providing of fair access to resources for all residents
- Improvement of lifestyle through health and well-being

To achieve these goals, the OLC Settlement Strategy has specific strategies for each region. For Woolgoolga, these include but are not limited to: development as a Coast Town, determination of appropriate zonings for the environment, advance the commercial aspect of the town, develop employment opportunities and industrial land needs, initiate a Special Investigation Area to the south west, and investigate potential expansion to the north west.

The **Residential Strategy: Draft Issues & Options Discussion Paper for Community Engagement** outlines the important residential issues in Coffs Harbour to be addressed before Stage 2. The Coffs Harbour City Council highlighted five key issues:

- 1) A growing and changing community
  - Ageing population
- 2) Evolving housing and accommodation needs
  - Lower occupancy rates
  - Importance of tourism
  - Woolgoolga has a high proportion of households experiencing rental stress at 41%

*“housing affordability is a significant issue within Coffs Harbour and appropriate planning responses are required to ensure that the community can meet household commitments.”*

- 3) Better definition of the character of residential zones
  - Encouragement of infill residential development
- 4) A review of built form controls and how they should be administered
  - Should contribute to natural, cultural, visual and built character values
- 5) Consideration of special ‘character’ precincts
  - Woolgoolga needs an easily identifiable centre, improved service range, and various dwelling types.

To address these concerns, the Report outlines potential options that necessitate further investigation and reiterates claims from previous reports that the Region has sufficiently zoned residential land to accommodate growth to meet community needs. This is despite Coffs Harbour not having a current and adopted Residential Strategy which adequately measures the community’s needs. Urban Economics considers that much of the land within *deferred* areas such as Moonee Beach which have not progressed for more than 15years, do not contribute to the residential land needs of Coffs Harbour and are unlikely to contribute in the short to medium term given the deferred status of these localities.

## 2.2 THE SUBJECT SITE

The subject sites comprise two distinct land parcels described as Lot 202 on DP874273 and is approximately 25.64ha. The parcels have different access points and road frontages with the southern parcel accessed from Newmans Road and the northern parcel having frontages to Bark Hut Road and Solitary Islands Way as illustrated in FIGURE 2.1.

The site is proximate to Woolgoolga High School which included more than 840 enrolments through 2016 and straddles the proposed Woolgoolga sports precinct. The subject development is convenient to a range of services and facilities including the Woolgoolga activity centre and a modern Woolworths supermarket; all of which are within 2km of the subject site.

**FIGURE 2.1: Subject Site**









Source: Nearmap showing May 5<sup>th</sup> 2016

## 2.3 THE MASTERPLAN

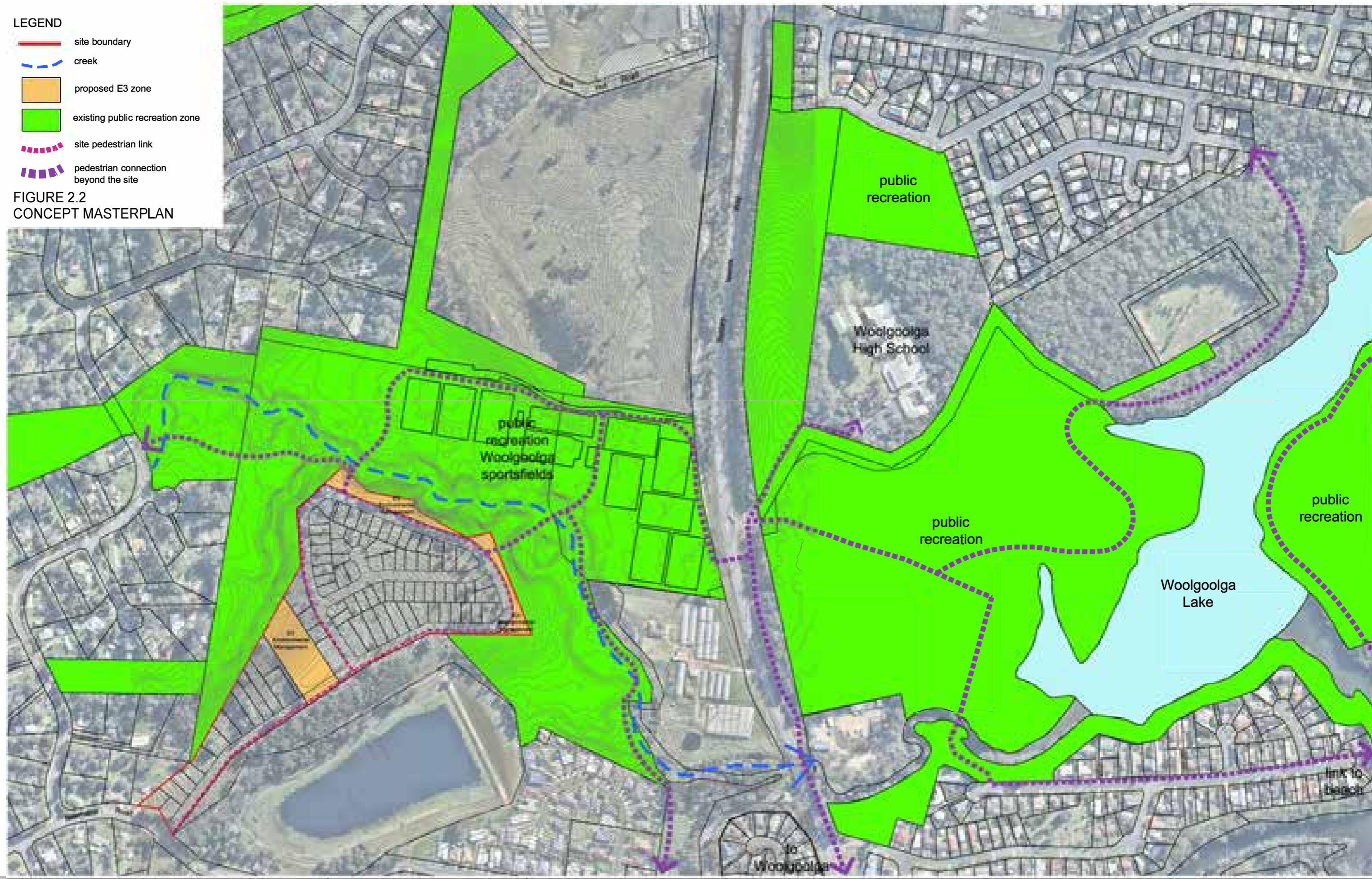
It is proposed to ultimately develop 82 residential lots within the masterplan area. Lots are estimated to be on average 600m<sup>2</sup>, and to potentially include a range of lot sizes accommodating choice in dwelling types and promoting affordability.

The masterplan is conceptual at this stage, but provides an indication of intentions for the site. Other considerations for the masterplan have also included an integrated aged care and retirement facility, such as has established at The Lakes community within the North Boambee Valley. Illustrated in FIGURE 2.2, the Draft Masterplan highlights the proposed development's proximity to Woolgoolga High School and the future West Woolgoolga Sports Complex and fields.

**LEGEND**

-  site boundary
-  creek
-  proposed E3 zone
-  existing public recreation zone
-  site pedestrian link
-  pedestrian connection beyond the site

**FIGURE 2.2**  
**CONCEPT MASTERPLAN**



Use figured dimensions in preference to scales. Please notify the Landscape Architect before proceeding if any anomaly is found between this drawing and conditions on site. This drawing must not be relied upon for any purpose other than that for which it was prepared or by any person or corporation other than the referred client.

AMENDMENTS			
Issue	Date	Details	Initial
A	22.2.18	Client review	JA
B	21.8.18	layout updated	JA
C	11.9.18	planning proposal	JA

<b>PROJECT</b> Bark Hut Road, Woolgoolga <b>PLANNING PROPOSAL</b>
<b>CLIENT</b> Keiley Hunter Urban Planner

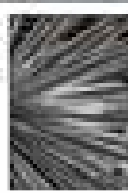
<b>DRAWING</b> Planning Proposal Open Space Masterplan
<b>DRAWING NO.</b> 1730-07

<b>DRAWN</b> JA	<b>ISSUE</b> C
<b>DATE</b> September 2018	



Scale 1:5000 @ A3  
metres 0 25 50 75 100 125

Jackie Amos Landscape Architect  
0427 887148  
jamosla@bigpond.net.au



## 3.0 RESIDENTIAL SUPPLY ANALYSIS

### 3.1 STUDY AREAS

Urban Economics has defined study areas for the analysis of residential land supply, to allow for statistical comparison between markets and localities. FIGURE 3.1 illustrates the Woolgoolga Study Area which is defined by the 2456 postal area and includes the localities (state suburbs) of Arrawarra, Arrawarra Headland, Corindi Beach, Emerald Beach, Mullaway, Red Rock, Safety Beach, Sandy Beach, Upper Corindi and Woolgoolga; within the context of the Coffs Harbour local government area (LGA).

The Woolgoolga Study Area has also been defined utilising Census statistical geographies and includes parts of both the Korora - Emerald Beach and Woolgoolga – Arrawarra statistical areas (SA2).





## 3.2 COFFS HARBOUR RESIDENTIAL MARKET

The Draft Coffs Harbour Residential Strategy identifies the historic role of the housing market of the region in *“the attraction of families and retirees from metropolitan areas further south in NSW such as Sydney. This has resulted in the steady residential expansion of coastal localities along the Mid North coastline to cater for population increases derived from the expansion of existing communities and migration in-flows.”*

At the time of the 2011 Census, Coffs Harbour included approximately 29,000 dwellings (26,000 occupied) of which around 76% were detached dwellings, 11% were semi-detached dwellings (row, terrace etc.) and 10% were flats units or apartments. Since this time, there have been more than 2,300 additional dwellings approved in the region and 2016 Census data indicates some 30,000 dwellings (27,000 occupied) at the time.

**TABLE 3.1: Building Approvals – Coffs Harbour LGA**

	New houses	New other residential building	Total dwellings
<b>2011-12</b>	195	53	273
<b>2012-13</b>	208	44	257
<b>2013-14</b>	227	51	282
<b>2014-15</b>	292	81	381
<b>2015-16</b>	268	178	452
<b>2016-17</b>	332	131	468
<b>2017-18*</b>	129	62	192

Source: ABS

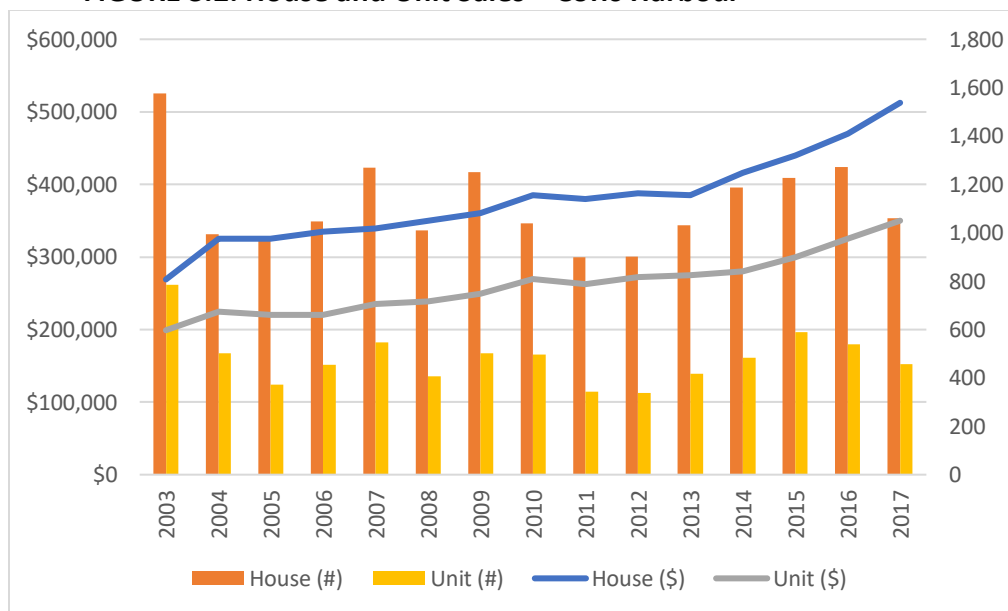
\*FY to November 2017

Similarly, the NSW Valuer General noted 23,148 lots within residential zones of Coffs Harbour as at July 1st 2017. The Valuer General’s 2015 report notes that *“Historically low interest rates have resulted in continued improvement in demand for properties throughout this sector (residential) of the market with local real estate agents reporting that selling periods have shortened and buyer demand has remained steady and strong throughout the past 12 -18 months. Single residential land values have increased across all established residential areas within the LGA, with most localities recording increases in the 3% to 6% range. No area reflected a drop in value levels which also **reflects a lack of supply** to the steadily growing demand which in turn drives up prices.”* The July 2017 Report further states *“Residential land showed a strong increase with increased demand for all classes of residential land in the coastal region (Coffs Harbour),”* and indicates a 10.3% increase in residential land values from 2016 to 2017.

Herron Todd White’s Month in Review for October 2016 indicated that residential property within Coffs Harbour is rising/approaching the peak of the market. The key housing market is indicated to be within the sub-\$500,000 range, mostly sought by first home buyers and establishing families, or investors capitalising on the transient nature of the region which inherently includes a strong rental market. HTW’s October 2017 report further indicates that housing within Coffs Harbour has decreased in affordability and “fringe beachside localities such as Corindi Beach to the north, being popular with commuters from both Coffs Harbour and Grafton, and Nambucca Heads to the south where property prices are considerably more affordable in the \$300,000 to \$400,000 price range.”

FIGURE 3.2 illustrates the growth within the house and unit markets of Coffs Harbour between to December 2017. Most notably, median house prices have increased more than 47% or approximately \$243,000 since 2003.

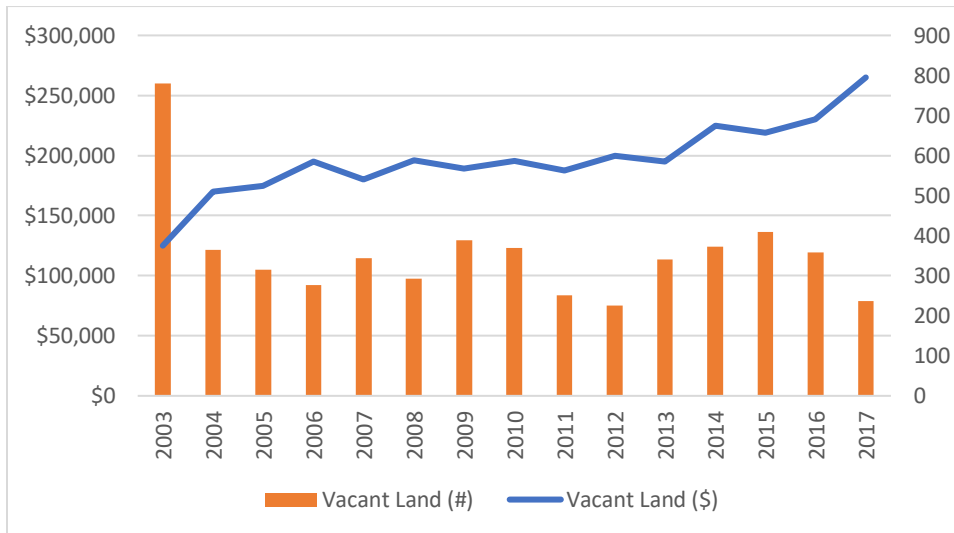
**FIGURE 3.2: House and Unit Sales – Coffs Harbour**



Source: Pricerfinder

Coffs Harbour has also recognised price growth within the market for vacant land, which as noted by the Valuer General, is a result of limited new supply within the region over this period. FIGURE 3.3 illustrates this dynamic whereby the volume of vacant land sales has declined and the median price has increased.

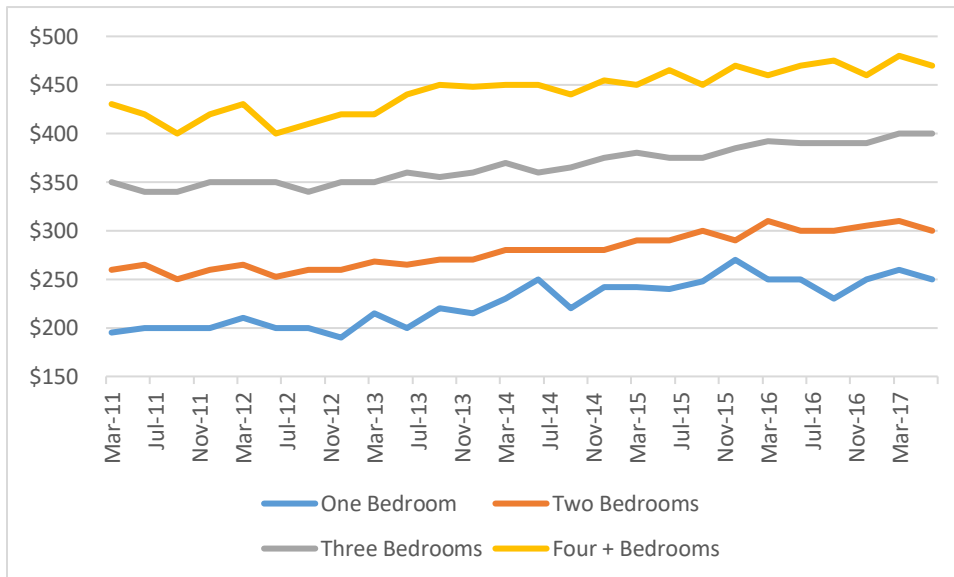
**FIGURE 3.3: Vacant Land Sales – Coffs Harbour**



Source: Pricefinder

Quarterly data provided by the Department of Family and Community Services outlines that the median rental price across the Coffs Harbour LGA has steadily increased, suggesting some supply constraints in the availability of rental accommodation. FIGURE 3.4 highlights this growth with a 4-bedroom house reporting a median rental price of \$470 for the June Quarter 2016.

**FIGURE 3.4: Median Rents – Coffs Harbour**



Source: Department of Family and Community Services

## 3.2 RESIDENTIAL ESTATES

There are numerous residential developments underway and proposed throughout Coffs Harbour. The following summarises known residential development projects for detached housing throughout the region.

Urban Economics undertook inspections of the various estates in October 2016 and gathered sales data from the respective agencies to determine the availability of lots within these developments at the time.

**Elements@Coffs** is a masterplanned estate in Boambee East which has been proposed to include some 221 lots over 13 stages. The release of stage 1 which comprises 30 lots has sold 29. Stage 1a has sold 3 of its 15 lots. Stage 2a has sold 4 of 11 lots. Stage 9 has sold 2 of its 15 lots. The median sale price has been approximately \$195,000 (\$250/m<sup>2</sup>) for sold lots between December 2013 and June 2017; less than 1 lot per month over this period. Based on sale plans for the estate, approximately 40 lots have been sold within the development. Whilst the price may be considered within the affordable range, the masterplanned area is quite undulating, which would add to the ultimate cost of building; and likely part of the reason for the subdued uptake of lots.

**Aspect@The Summit** is a land release within **The Summit** development which is situated on the ridge above The Big Banana. Aspect included 29 lots between 465m<sup>2</sup> and 1,001m<sup>2</sup>, all of which have already been sold. Available lots had a large price range of between \$220,000 and \$410,000; reflective of the achievable views and cost of development for sloped land.

**Woopi Beach Estate** is located at the corner of Hearn's Lake Rd and Solitary Islands Way in Woolgoolga which will ultimately include some 90 lots averaging around 700m<sup>2</sup> each. Currently undertaking presales for second release, 42 of the initial 90 lots have been sold or are under contract for between \$218,000 and \$235,000, with a further 60-lots becoming available in a potential future release.

**North Sapphire Beach** is a large masterplanned estate established by the Walker Group which sold out between early 2011 and October 2017. The final 'Sugar Mill' release in the development is currently sold out with lot sales priced between \$250,000 and \$285,000 for lots of between 447m<sup>2</sup> and 685m<sup>2</sup>.

**Sapphire Beachfront** is a premium beachside release of lots within a community titles scheme. Of the 40 lots released all have been sold, with vacant lots achieving up to \$825,000 or \$1,475/m<sup>2</sup>.

**Woolgoolga Heights** is an approved 50 lot development (Stage 1) located at the intersecting Haviland and Backhouse streets in Woolgoolga. Advertised from \$185,000 for lots sized between 600 and 700m<sup>2</sup>, the relevant sales agency has advised that development is not progressing at Woolgoolga Heights at this stage. Woolgoolga Heights forms part of a 30.4ha, 'proposed agreed growth area' within the Our Living City Settlement Strategy and is illustrated in FIGURE 3.5 below.

This area was intended to support some 300 dwellings from 2016 of which none have progressed at this stage.



*Stalled development at Woolgoolga Heights*

**North Sandy Beach** estate includes some 82 lots of which all have been sold. Initial lots were sold individually for \$155,000-\$190,000 and as 'affordable' house and land packages within the sub-\$500,000 bracket. The short sales period of just 15 months for this development (February 2015 to May 2016) is indicative of the demand for affordable family dwellings and investor demand in this price range.



*Detached housing construction at North Sandy Beach*

**Seacrest at Sandy Beach** adjoins North Sandy Beach estate and is masterplanned to include 166 residential lots. Stages 1 and 2 (43 lots) are completed and sold whilst 123 lots within stages 3 to 5 are predominantly presold with civil works continuing.

**Nautica Fairways Estate** at Safety Beach has evolved since initial lots were released in 2003. The development has more recently accelerated sales with the current release of 9 lots in Stage 9 having already sold 3. Available lots are currently advertised for \$260,000 and \$310,000 for areas of between 639m<sup>2</sup> and 852m<sup>2</sup>.

**Emerald Beach Estate** is a 112-lot subdivision is located at the entrance to the Emerald Beach residential area. Stages 1 and 2 within the project have sold out (60 lots) and Stage 3 (16 lots) has just 6 remaining according to the December 2017 sales plan.

### 3.3 PROPOSED AND APPROVED DEVELOPMENTS

- Immediately north of the subject site a parcel described as Lot 2 on DP1143755 has been mooted to include a residential subdivision. The Our Living City Settlement Strategy (FIGURE 3.5) identifies that this parcel could support approximately 540 dwellings after 2031. Sequentially, development at this site would logically follow development at the subject site based on geographic position and location with respect to services and facilities.
- A 14.2ha growth area has been designated within the Woolgoolga Diggers Golf Course (FIGURE 3.5). This site was proposed to support 120 dwellings from 2016, however no plans or development have progressed to date.
- 13 Hearn Lake Rd, Woolgoolga is proposed to include some 63 lots from 547m<sup>2</sup> in area. The development would sequentially follow on from the current development of Woopi Beach Estate and has been included as such within this Analysis.



*Proposed 13 Hearn Lake Rd subdivision*

Other residential 'proposed agreed growth areas' within the Study Area have been identified from the Our Living City Settlement Strategy, none of which have commenced to an application or development phase including:

- 15.8hectares over 12 large lots at Corindi Beach

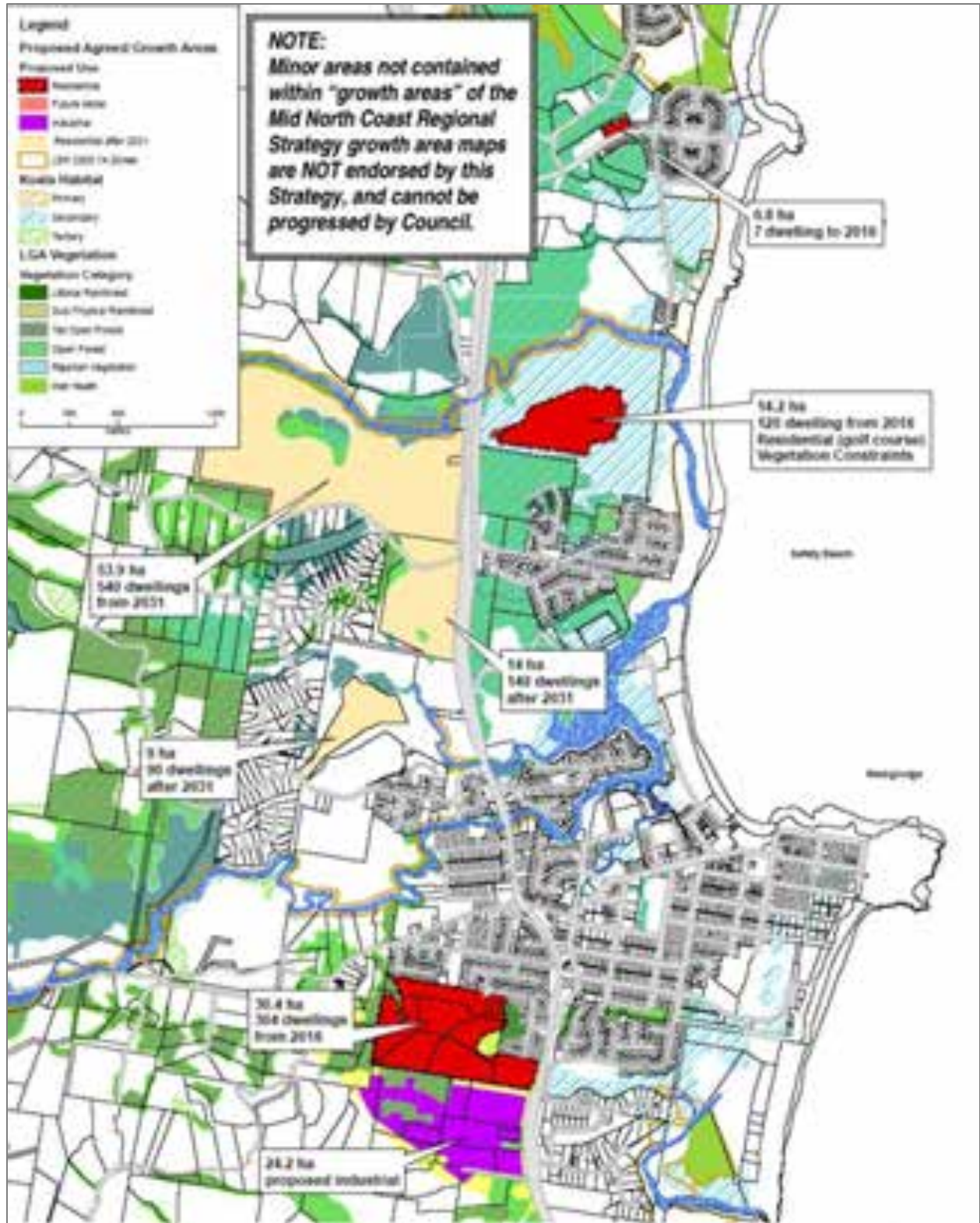
- 5 hectares at 97 Pacific St, Corindi Beach
- 2.5 hectares at Arrawarra Headland
- 0.8 hectares at Mullaway.

In total, some 68.8 hectares of land with the noted potential of approximately 665 dwellings has yet to have had plans progressed for development, which is not conducive to the steady and orderly release of residential land in the area.

The trend for residential development plans not advancing in the Region is evident within the numerous former 'Part 3A applications' which are now listed as Major Project Assessments by the Department of Planning and Environment including:

- **Glades Estate** at Moonee Beach which was initially proposed in mid-2006 to include approximately 522 lots and has undergone numerous iterations and modifications since;
- A 165-lot subdivision at Lyons Rd, North Bonville which commenced in 2008;
- The **Moonee Waters** project was initiated in 2005 to include 300 lots adjoining the North Sapphire Beach Estate, on a site with environmental constraints;
- **Sandy Beach North** (noted as an undeveloped and zoned urban area) has been proposed since early 2006 to include 280 residential lots on a 50-hectare site bound by Hearnese Lake, the Pacific Highway and the coast.
- A development parcel of approximately 25ha and known as '**Pacific Bay Estate**' has recently been sold. The site was mooted as being able to support residential development of 110 to 130 residential lots since 2006.

**FIGURE 3.5: Proposed Agreed Growth Areas**



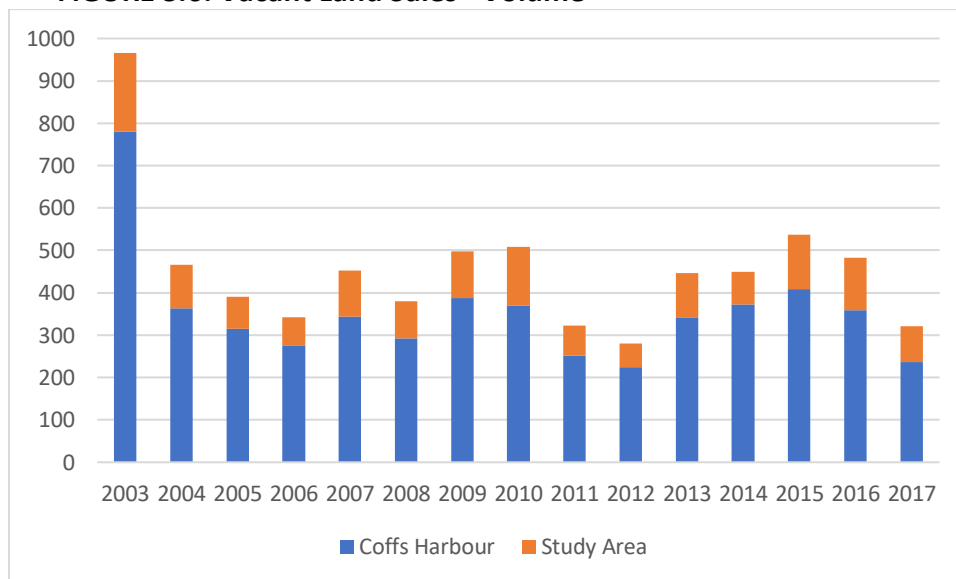
Source: Our Living City Settlement Strategy – Map 4B



### 3.4 THE WOOLGOOLGA STUDY AREA

The market within the Study Area has consistently represented approximately 20% of the volume of house sales and 5% of unit sales within the broader Coffs Harbour area. These products have also for the most part, had commensurate median sales prices over this time. Vacant land sales however have diverged, with the majority of new estates establishing within the Study Area as opposed to the balance of the greater Coffs Harbour region as illustrated within FIGURE 3.6, representing 35% of all sales through 2016 and 2017.

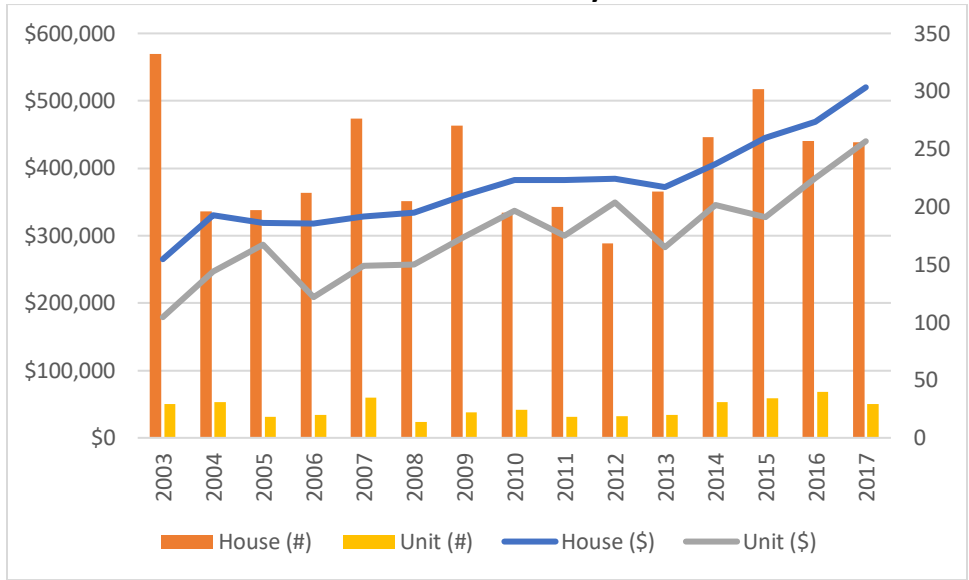
**FIGURE 3.6: Vacant Land Sales - Volume**



Source: Pricerfinder

Detached house sales represent the majority of transactions within the Study Area. For the year to December 2017, the median sales price within the Woolgoolga Study Area was \$520,000 and whilst representative of a substantially more affordable market than Greater Sydney, Brisbane and the Gold Coast and even the Regional markets of Port Macquarie and Newcastle; has demonstrated significant price growth since 2013, impacting upon the area's relative affordability.

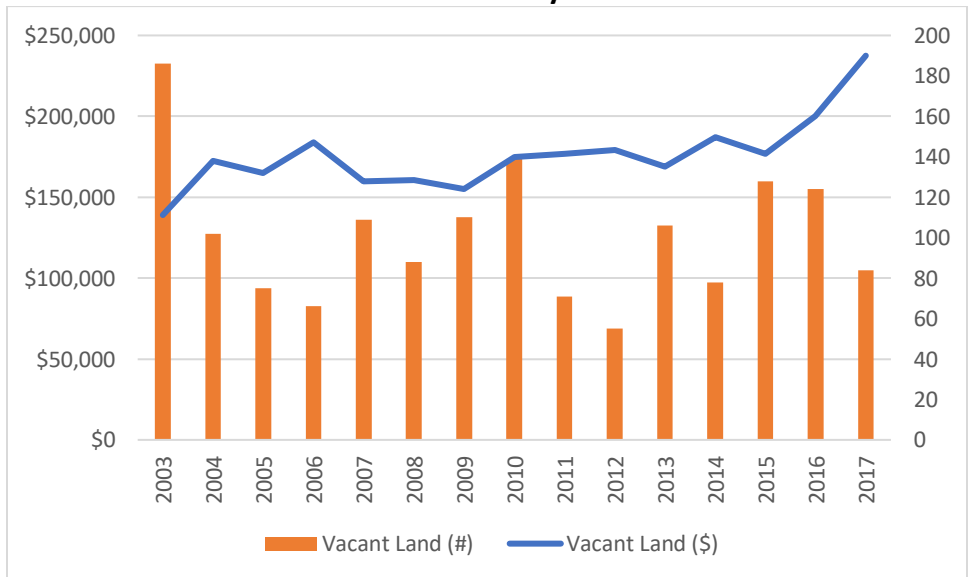
**FIGURE 3.7: House and Unit Sales – Study Area**



Source: Pricefinder

Vacant land sales within FIGURE 3.8 illustrate the vagaries of the land supply market and indicators of a supply-led market within the Study Area over the last 15 years, with median land prices moderating during periods of increased supply. The median residential lot price within the Study Area has increased markedly between 2015 and 2018, indicative of a supply constrained market.

**FIGURE 3.8: Vacant Land Sales – Study Area**



Source: Pricefinder

### 3.5 VACANT LAND SUPPLY

In summary, Urban Economics considers the Woolgoolga Study Area to have the following supply implications regarding the provision of lots for detached residential housing development.

- There is evidence of a supply-led and in some instances supply-constrained land supply market within the Study Area with a number of estates reporting pre-scales of lots prior to certification and works.
- 80 lots available within active residential estates within the Study Area (Woopi Beach and Nautica Fairways).
- 350 lots approved within the Study Area (Woolgoolga Heights, Hearnese Lake Rd, Emerald Beach Estate and Seacrest at Sandy Beach).
- 1,155 potential lots within identified growth areas of the Our Living City Strategy (excluding the subject site and proposed/approved developments).
- 400 potential lots within existing residential zoned englobo areas including Sandy Beach North.
- Numerous proposed, stalled and low potential projects throughout the Coffs Harbour region which will have limited opportunity to contribute to land supply and housing affordability in the short to medium term.



**Woopi Beach Estate lot plan, Woolgoolga**

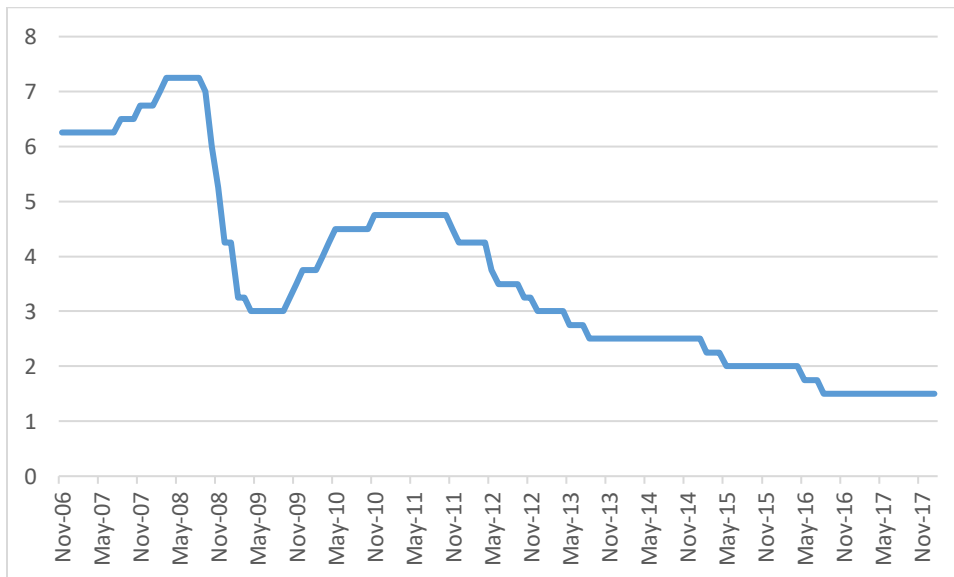
## 4.0 DEMAND ANALYSIS

### 4.1 DEMAND DRIVERS

Economic conditions in Australia have in more recent times been defined by the existence of a “two speed economy” - the resources and energy sector, which has experienced strong levels of activity, fuelled by demand particularly from China and India, and the remainder of the economy, which is much more susceptible to fluctuating international conditions, particularly from Europe and the US, which impact on business and consumer confidence. Slowing of the resources and energy sector has seen the strengthening of property and health care sectors in supporting economic growth.

The tenuous conditions have been reflected in the Reserve Bank’s policy approach to adopt a sustained record low interest rate in seeking to stimulate activity and confidence in the Australian economy post the GFC and as the resources and energy sector plateaus. The sustained low interest rates have created substantial competition amongst financial institutions and lenders, offering investors and borrowers access to more affordable lending rates, whilst the flow-on effects for the residential property market are being realised.

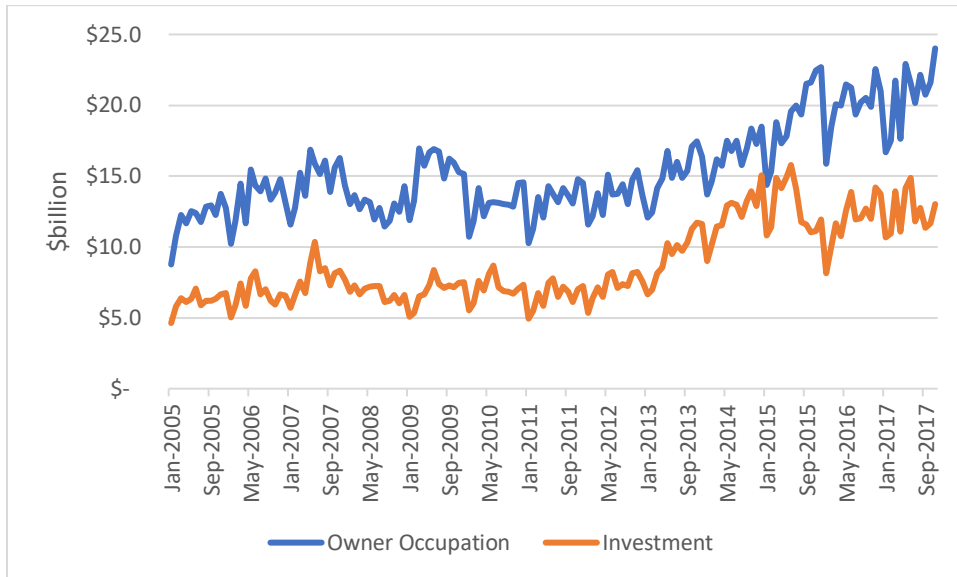
**FIGURE 4.1: Cash Interest Rate Australia**



*Source: Reserve Bank of Australia*

It is interesting to note that the value of housing finance commitments continued to rise to record highs for investors in 2014/15 and owner occupation at the end of 2015. Tighter lending conditions imposed by banks has moderated lending activity somewhat; particularly from investors however there has remained significant activity from owner occupiers which accounted for \$25billion of residential loans in November 2017, as illustrated in FIGURE 4.2.

**FIGURE 4.2: Residential Finance Commitments Australia**

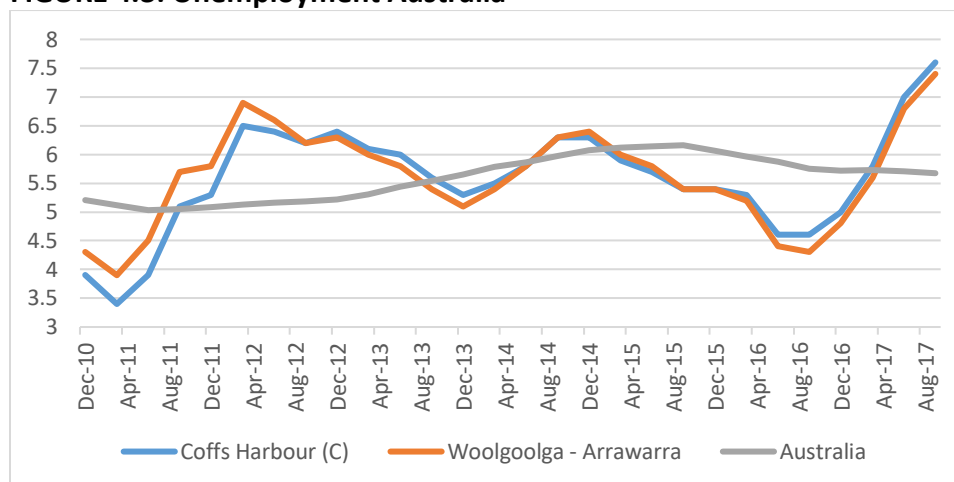


Source: ABS

Another measure of Australia's economic performance and indicators for consumer confidence is Gross Domestic Product (GDP). Australia was the only advanced economy to not record negative GDP growth following the GFC, largely attributed to the buoyancy of the resources sector at the time. In a post-resources boom, areas such as new housing and construction will play an increasingly significant part in maintaining a positive economic output, and have been much relied upon by various state and federal treasuries in budget formulation. This is particularly important in the Coffs Harbour region whereby the construction industry accounts for some 15% of employment.

FIGURE 4.3 illustrates the unemployment rates of Coffs Harbour and the Woolgoolga-Arrowarra SA2 to the Australian average; highlighting the declining employment rate in the region.

**FIGURE 4.3: Unemployment Australia**

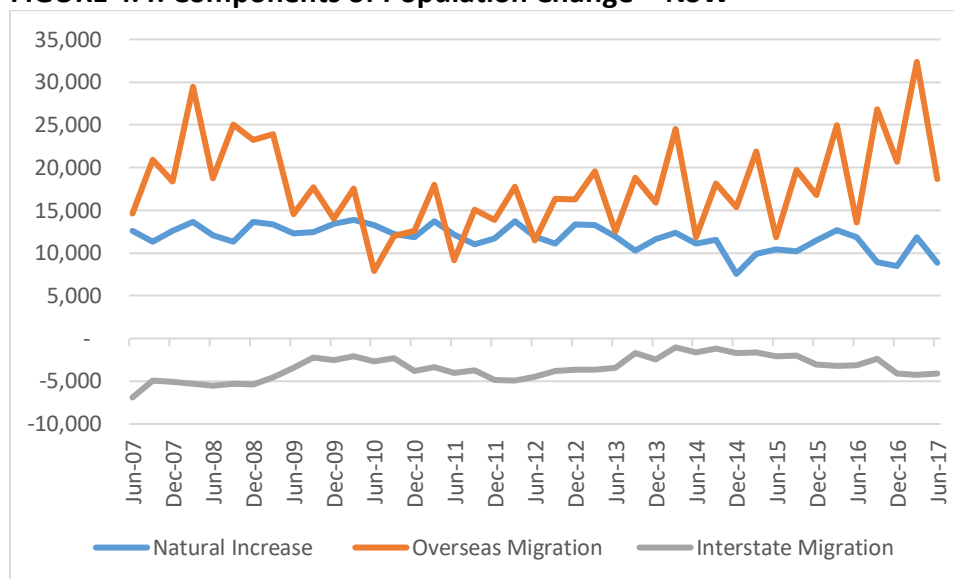


Source: Department of Employment

Critically, with national and state economic conditions being fundamentally solid, the indicator of consumer confidence has remained in positive territory, although subdued, and is reflective of confidence being buoyed by a level of job security expectations, low interest rates and rebounding commodity prices, yet weighed down by fears about the potential rising costs of living and international events. The Westpac-Melbourne Institute's Consumer Sentiment Index remained positive for the at 105.1 as at January 2018.

Typically, NSW and Sydney has the largest net loss of population through interstate and intrastate migration respectively. Commensurately, NSW and Sydney also have the highest levels of overseas migration contributing to population growth. More recently however, net migration outflows from NSW have reduced as illustrated in FIGURE 4.4, coincident with the stronger performing economy in New South Wales and lower unemployment rates.

**FIGURE 4.4: Components of Population Change – NSW**



Source: ABS

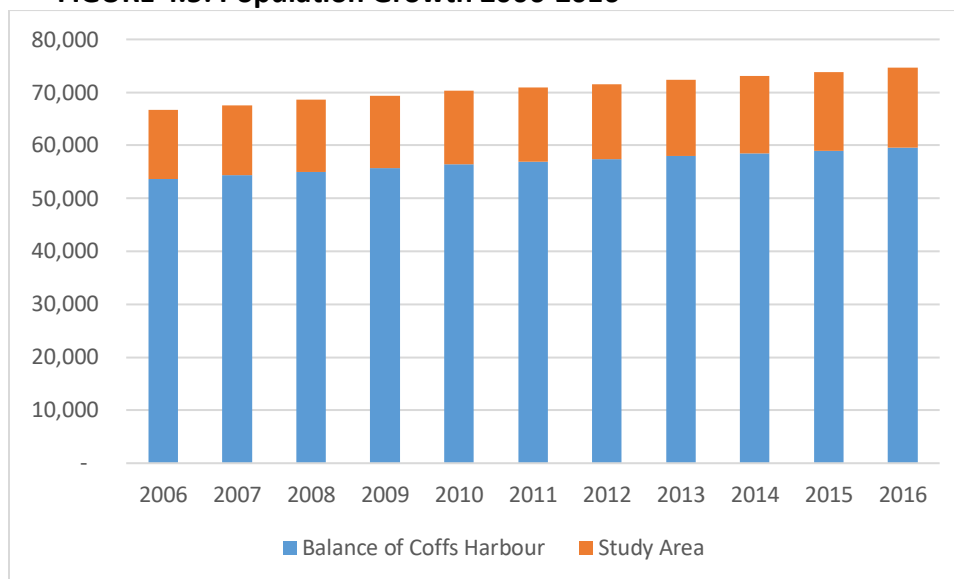
Urban Economics notes that the increasing price disparity between housing in Australia’s eastern capital cities of Sydney, Brisbane and Melbourne compared to other regional centres such as Coffs Harbour, is creating conditions that may again see an influx of interstate and intrastate movers into regional areas with solid job prospects, and further demand for housing, particularly if coupled with increasing employment opportunities and affordable family and investment dwellings.

## 4.2 POPULATION AND HOUSEHOLD GROWTH

Between 2006 and 2016, the population of Coffs Harbour increased from an estimated 66,657 in 2006 to 74,641 persons in 2016; or by almost 8,000 persons at approximately 1.1% per annum over this period. FIGURE 4.5 breaks down population growth within the region between 2006 and 2016, demonstrating the increasing proportion of this growth within the Woolgoolga Study Area which increased by around 2,050 persons or 1.5% per annum over the decade.



**FIGURE 4.5: Population Growth 2006-2016**



Source: ABS

Population projections prepared by the NSW Department of Planning estimate that population growth will continue within Coffs Harbour to include some 92,650 persons by 2036 or around 16,800 additional persons between 2016 and 2036.

Coffs Harbour City Council has had population projections prepared by Forecast.id. for small areas in the Region. These projections highlight the anticipated acceleration of growth within the northern localities of Coffs Harbour, particularly Woolgoolga which is forecast to include some 3,450 additional residents between 2018 and 2036. The following TABLE 4.6 summarises Urban Economics’s population projections for the Woolgoolga Study Area guided by data from the ABS, NSW Department of Planning & Environment and Coffs Harbour City Council (Forecast.id. & Our Living City Settlement Strategy/Land Capacity Assessment).

Approximately one third of population and household growth within the Coffs Harbour region is projected to be accommodated within the Study Area. This position is commensurate with the Our Living City Settlement Strategy, whereby the ‘Northern Beaches’ (including Woolgoolga) is projected to support some 35% of new dwellings within the Region over the life of the Strategy.

Urban Economics’s projections for population growth within the defined Woolgoolga Study Area have applied an accelerating growth between 2016 and 2026. This position has been based on some assumptions which have guided the projections including:

- The development profile of the Study Area continues to include detached and relatively affordable, family type dwellings which will support and attract larger households and family groups; reflected in slightly increasing household sizes.

- Current takeup rates of other estates within the Study Area such as Woopi Beach Estate North Sandy Beach and Emerald Beach Estate suggest that there is an existing and emerging demand for residential land and dwellings in the area which is affordable. The proposed development and subject site would similarly provide a residential product to meet this demand and has been assumed to commence by 2021.
- The Our Living City Settlement Strategy estimated that growth within the Northern Beaches locality would be strongest between 2006 and 2011 (2.5% p.a.) and tapering off towards 2031. Urban Economics's projections have adopted this growth profile, however have shifted forward the timeline to allow for changes since the Strategy was published.

Population estimates by age have also been derived for the Study Area utilising projections provided by the Department of Planning and Environment. Whilst almost 50% of the growth is noted to comprise persons aged over 65, this is significantly lower than the estimated 90% of growth that the Draft North Coast Regional Plan projects will be from persons aged 65+ across the Region. Similarly, the age profile suggests the need and potential for a diversity of housing types within the Study Area toward 2036; including detached family dwellings, retirement living and aged care facilities. Diversity of residential living options and dwellings forms contributes to promoting affordable lifestyles.

**TABLE 4.6: Study Area Population and Household Projections**

	2011 (Act)	INCREASE P.A.	2016 (Act)	INCREASE P.A.	2017 (Est)	INCREASE P.A.	2021 (Proj)	INCREASE P.A.	2026 (Proj)	INCREASE P.A.	2031 (Proj)	INCREASE P.A.	2036 (Proj)
<b>Population</b>	14,023	1.4%	15,039	2.1%	15,360	1.8%	16,520	1.7%	17,980	1.5%	19,370	1.2%	20,540
<b>Dwellings</b>	5,842	40	6,042	100	6,142	150	6,742	150	7,492	150	8,242	100	8,742
<b>PPH</b>	2.40		2.49		2.50		2.45		2.40		2.35		2.35

Source: ABS, QGSO, Coffs Harbour City Council, NSW Department of Planning and Urban Economics' estimates

**TABLE 4.7: Study Area Population Projections by Age**

Age	2011	2016	2021	2026	2031	2036
<b>0-4</b>	823	847	921	993	1,039	1,078
<b>5-9</b>	843	914	990	1,087	1,158	1,187
<b>10-14</b>	1,036	1,035	1,165	1,290	1,387	1,450
<b>15-19</b>	949	912	938	1,064	1,157	1,221
<b>20-24</b>	597	605	590	601	657	681
<b>25-29</b>	663	737	775	783	797	842
<b>30-34</b>	686	811	916	968	982	988
<b>35-39</b>	801	788	952	1,080	1,119	1,116
<b>40-44</b>	890	865	900	1,088	1,205	1,213
<b>45-49</b>	930	893	917	965	1,142	1,238
<b>50-54</b>	1,136	1,094	1,125	1,195	1,234	1,418
<b>55-59</b>	1,173	1,232	1,262	1,333	1,391	1,424
<b>60-64</b>	1,001	1,096	1,226	1,278	1,328	1,366
<b>65-69</b>	761	964	1,107	1,267	1,304	1,339
<b>70-74</b>	596	724	957	1,130	1,272	1,295
<b>75-79</b>	503	567	725	973	1,123	1,258
<b>80-84</b>	354	357	432	584	793	908
<b>85+</b>	634	702	801	952	1,149	1,424
<b>TOTAL</b>	14,023	14,770	16,290	18,170	19,740	20,920

### 4.3 DEMOGRAPHIC PROFILE

The results of the 2016 ABS Population and Household Census (the most recent Census results available) have been utilised to examine the demographic and socio-economic characteristics of the resident population of the Study Area community, compared to the Coffs Harbour LGA, and NSW and are summarised in TABLE 4.8.

**TABLE 4.8: Demographic Profile**

Demographic	Study Area	Coffs Harbour	NSW
<b>Age Profile (%)</b>			
<i>0-14yrs</i>	18.4	18.2	18.5
<i>15-29yrs</i>	15.6	16.2	19.6
<i>30-59yrs</i>	37.3	37.2	40.0
<i>60+yrs</i>	28.7	28.4	21.9
<b>Labour Force (%)</b>			
<i>Unemployment Rate</i>	7.6	7.3	6.3
<i>Workforce Participation Rate</i>	53.0	53.6	55.5
<b>Occupation Profile (%)</b>			
<i>Managers/Administrators</i>	14.1	11.9	13.5
<i>Professionals</i>	17.0	18.8	23.6
<i>Technicians &amp; Trade Workers</i>	13.9	13.5	12.7
<i>Community &amp; Personal Service Workers</i>	11.5	12.4	10.4
<i>Clerks, Administrative &amp; Sales Workers</i>	11.6	13.0	13.8
<i>Sales Workers</i>	8.1	10.8	9.2
<i>Machine Operators &amp; Drivers</i>	5.5	5.4	6.1
<i>Labourers</i>	16.6	12.5	8.8
<i>Inadequately Described/Not Stated</i>	1.8	1.7	1.8
<b>Home Ownership (%)</b>			
<i>Owned Outright</i>	41.5	36.3	32.2
<i>Mortgage</i>	29.5	28.7	32.3
<i>Rent</i>	24.7	30.8	31.8
<i>Other/Not Stated</i>	4.3	4.2	3.8
<b>Structure of Dwellings (%)</b>			
<i>Separate House</i>	85.6	74.3	66.4
<i>Semi-detached/Row/Terrace/Townhouse</i>	7.3	12.3	12.2
<i>Flat/Unit</i>	1.7	10.1	19.9
<i>Other/Not Stated</i>	5.4	3.3	1.4
<b>Number of Vehicles Per Dwelling (%)</b>			
<i>0</i>	4.1	6.1	9.2
<i>1</i>	35.9	37.7	36.3
<i>2</i>	37.8	36.3	34.1
<i>3</i>	10.9	10.6	10.9
<i>4+</i>	6.5	5.2	5.8

<i>Not Stated</i>	4.8	4.1	3.7
<b>Average Annual Household Income (\$2016)</b>	<b>72,690</b>	<b>73,290</b>	<b>96,410</b>
<b>Relationship in Household (%)</b>			
Husband or wife in a registered marriage	38.8	37.0	38.5
Partner in de facto marriage	8.8	8.3	6.9
Lone parent	5.0	5.6	4.5
Child under 15	18.7	18.7	18.9
Dependent student (Aged 15-24 years)	3.9	4.1	5.2
Non-dependent child	5.7	5.8	6.8
Other related individual	2.1	2.0	2.6
Unrelated individual living in family household	1.4	1.3	1.4
Group household member	2.9	3.4	3.8
Lone person	9.5	11.0	9.0
Visitor (from within Australia)	3.0	3.0	2.2

Source: 2016 ABS Census

- Both the Study Area and Coffs Harbour communities had distinctly higher proportions of retirees and older persons compared to NSW. At the time of the Census, approximately 28.7% of Study Area residents were aged over 60 compared to 21.9% in NSW.
- Whilst having a high proportion of older persons, the Study Area also included an average level of school aged children, commensurate with the number of schools in the area including Woolgoolga High School, Woolgoolga PS, Sandy Beach PS, Mullaway PS and St. Francis Xavier Primary; which together had 1,984 enrolments through 2016.
- At the time of the 2016 Census, the Study Area had a heightened unemployment rate (7.6%) and lower levels of workforce participation (53%), typical of areas with higher levels of retired persons.
- Dwellings within the Study Area in 2016 were predominantly detached houses (85.6%) with limited flats, units and apartments (1.7%), demonstrative of the area's popularity for families seeking larger dwellings. Similarly, more than 40% of dwellings within the Study Area were owned outright in 2016 which is characteristic of the higher incidence of families in the later stages of the lifecycle including retirees.
- Average household incomes within the Study Area (\$72,690) and Coffs Harbour region (\$73,290) were significantly lower than the NSW average. This is linked to the heightened proportion of retired persons in these areas and a blue collar workforce with higher levels of labourers, trade workers, clerks and sales workers at the time. Despite this, 2013-14 data from the ATO outlines average individual salaries and wages of \$42,000 within the Study Area at the time.

#### 4.4 RETIREMENT LIVING AND AGED CARE DEMAND

Whilst not included as part of the concept masterplan for the subject site, the potential for retirement living and residential aged care has been investigated for the Study Area and proposed development, particularly given the age profile of the community and issues raised within the Draft Residential Strategy.

The proponent has considered 'The Lakes' development at North Boambee Valley, which integrates an Opal aged care facility and The Lakes Village retirement living as an example of a potential outcome for the subject site at Woolgoolga.

Typically, some 6% of Australian's over the age of 65 years live within purpose built retirement accommodation such as independent living units (ILU). At an average of 1.5 persons per dwelling this suggests a ***demand for some 115 retirement dwellings within the Study Area in 2016 increasing to 155 dwellings by 2026.***

This makes no allowance for over 65's in coastal areas such as Coffs Harbour to live in purpose-built retirement accommodation. For instance, Urban Economics's analysis in Bundaberg estimates that some 16% of those aged 65+ live in retirement accommodation.

Development of residential aged care within Australia is guided by a government planning ratio of 80 places per 1,000 persons aged 70+. Based on this ratio, residents of the Study Area would have a demand for some ***150 residential aged care places in 2016 and 200 places by 2026.***

The Study Area currently includes the Woolgoolga and District Retirement Village which has 66 residential aged beds and 30 ILUs. Gateway Lifestyle also operate 'The Pines' and 'Lorikeet Park' manufactured home parks for over 50's which have 264 approved home sites of which approximately 50% are occupied. There is a need to ensure choice in the timely provision of age and sector appropriate housing in the Study Area and Coffs Harbour.



***Opal Aged Care facility, The Lakes***

## 4.5 IMPLICATIONS

There are numerous factors driving the demand for new residential development and the demand for detached housing lots within the Woolgoolga area including:

- Low interest rates and the availability of finance,
- Improved employment prospects and labour markets within the Coffs Harbour region,
- Affordable housing options relative to other major markets along Australia's east coast; and
- A fundamentally solid rental market which is attractive for residential property investment.

Residents of the Study Area community have a propensity for demand for affordable detached housing for families, but also a choice in residential product catering to retirees, older persons and other more compact households.

**Based on population growth alone, the Study Area is projected to require an additional 2,600 dwellings between 2017 and 2036 or more than 130 new dwellings per annum over this period.** A significant share of this dwelling demand will continue to be directed to detached dwellings and therefore demand for residential lots.

## 5.0 DEMAND AND SUPPLY CRITIQUE

### 5.1 SEQUENTIAL SITE ANALYSIS

This section seeks to summarise the case for the subject site to establish as an important residential land release area within the Woolgoolga area, prior to the existing planning timeframe of 2031. It is Urban Economics's view that the subject site represents the most sequentially logical englobo land parcel within the region which could accommodate residential development from an economic perspective. The following supports this view:

- Approximately 38.3ha of land slated to support 353 residential lots from 2016 within the Our Living City Settlement Strategy as 'growth areas' have yet to commence any advanced planning or had any plans progressed which would see them contribute to supply within Woolgoolga in the short to medium term. A further 30.4ha and 300+ dwellings have stalled in development within the Woolgoolga Heights estate.
- The subject site is proximate to Woolgoolga High School, the only secondary education facility between Orara High School to the south and facilities within Grafton some 55km driving to the north.
- A substantial amount of land area within the Coffs Harbour region is quite undulating and sloped. Construction costs for dwellings on sloped land is considerably higher than flat sites. Whilst the subject site has some undulation; the proposed development has the potential to provide 'easy to build' lots; contributing to the ultimate affordability of housing in the locality.
- Other significant proposed projects such as Sandy Beach North have considerable environmental constraints, similarly limiting their potential contribution to residential land supply within the Woolgoolga Study Area. The subject site is largely cleared and set back from waterways and the coast, limiting its environmental constraints and subsequent potential for delivering the proposed development.
- The proposed development would contribute to, and support the construction of, the West Woolgoolga Sports Facility which will be an important piece of community infrastructure once completed.
- The subject site is within 2km of the Woolgoolga activity centre and just 1km from the Woolgoolga Woolworths shops, consolidating households within the catchment areas for these centres and contributing to the vibrancy and vitality of these centres as well as ensuring the development of residential activity within proximity of convenience and weekly shopping and services.





*Woolworths Woolgoolga*

- The subject site would deliver a masterplanned development offering certainty in ongoing supply of residential land within Woolgoolga proximate to services and community facilities in maximising an affordable lifestyle for residents.

## 5.2 IMPLICATIONS FOR LAND SUPPLY & THE PROPOSED DEVELOPMENT

- Residential development inherently has a level of ‘supply-led’ demand. That is, without the delivery of the appropriate housing product and residential land, demand from population growth cannot be accommodated or eventuate. Woolgoolga is planned to include a significant share of the population growth within Coffs Harbour, but the area is currently hamstrung as a result of uncertainty in the delivery of appropriate residential development.
- Some smaller and existing residential developments such as the Nautical Fairways estate have not benefited from the sales momentum that is achieved through the creation of a large, staged and masterplanned community. The proposed development would contribute almost 300 lots and potentially integrate aged care and retirement facilities proximate to numerous community facilities; creating a development which is attractive for purchasers and capitalising on the ‘Delfin Effect’ which acknowledges the success of masterplanned communities by the former Delfin Group (now Lend Lease).
- The actual release and development of most ‘*proposed agreed growth area*’ land within the Settlement Strategy has little potential of actually keeping pace with the planned release ‘*from 2016*’. The subject site is more ‘shovel ready’ and proximate to the Woolgoolga activity centre and facilities; which is sequentially superior to much of the land release areas than the planned post-2031 development timeframe.

- The Woolgoolga locality is experiencing a decrease in affordability, a feature which in the past has made it an attractive place to establish a home. Urban Economics’s investigations have revealed that there are no longer any lots available within the Woolgoolga Study Area within the sub-\$200,000 price bracket with the minimum lot now marketed from \$220,000 in existing developments. The proposed development would contribute to reducing the increasing growth rate of residential land in Woolgoolga and continue to promote the area for affordable living for families and retirees alike.
- Generally, future land planning should allocate at least seven years of residential supply in creating a balanced market which is developed in a timely manner and is not impacted by inflationary price pressures. Confidence in future land supply and delivery is critical to maintaining housing affordability. Existing lots, approved developments and zoned/high potential residential land represents an estimated 310 lots or approximately 3years supply within the Study Area, allowing for a mix of attached and alternative dwelling forms.
- Between 3 to 5 years is typically required for the delivery of lots to market from residential concept through application to marketing, necessitating continuity in residential land supply.
- This land supply analysis assumes that all approved, zoned and high potential residential land is developed and within a timely period. This is subject to several local and market vagaries including the intentions and capacities of land owners, commercial developability and viability of various land parcels and development options and the mix of product delivered to the market. In reality, this 3 years supply may in effect be considerably reduced, however, for the purposes of this consultancy we have applied the “ultimate” development scenario in examining the potential demand for the proposed residential development.
- Based on demand and the projected take up of land, the proposed development would represent approximately 3 years supply of detached residential housing lots from 2021. TABLE 5.1 outlines the land supply critique within the Woolgoolga Study Area, identifying the potential for the development to proceed in the short to medium term (prior to 2021).
- Whilst the potential and proposed supply suggests a supply of around 3 years, residential lots which are actually available to the market for purchase within Study Area developments represent only 2 to 3 months supply; limiting choice and affordability, which is evidenced by the sharply escalating price for lots within the area.

**TABLE 5.1: Supply Potential Critique**

Name	Status	Land Area	Total Lots	Lots Sold	Lots Available	Potential	High Potential Supply
Woopi Beach Estate	Stage 2 sales	9.5ha	150	42	108	High	108
Woolgoolga Heights	Pre-sales	4.92ha	50	0	0	Low	-
North Sandy Beach	Complete	8.4ha	82	82	0	-	-
Seacrest at Sandy Beach	Stage 1 & 2 complete	18.8ha	166	166	0	High	-
Nautica Fairways Estate	Stage 11 sales	18.5ha	209	201	8	High	25
Emerald Beach Estate	Stage 3	11.5ha	76	70	6	High	6
Balance of zoned englobo land	Zoned Urban - Residential	15ha	150	0	0	High	150
<b>Proposed Growth Areas from 2016</b>							
2 Arrawarra Rd, Mullaway	Approved	3.1ha	22	0	0	High	22
220 Arrawarra Rd, Arrarwarra	?	2.1ha	21	0	0	Low	-
Woolgoolga Golf Course	?	14.2ha	120	0	0	Low	-
Red Rock Rd, Corindi	?	15.8ha	158	0	0	Low	-
97 Pacific St, Corindi	?	5ha	50	0	0	Low	-
201-203 Arrawarra Rd, Arrarwarra	?	0.4ha	4	0	0	Low	-
Sandy Beach North	Proposed	49.6ha	280	0	0	Low	-
<b>Proposed Growth Areas from 2031</b>							
Subject Site - Bark Hut Rd, Woolgoolga	Proposed	25.7ha	293	0	0	High	293
Lot 2 on DP1143755, Pacific Highway Woolgoolga	Proposed	53.9ha	540	0	0	Low	-

## 6.0 CONCLUSION

The residential market in Coffs Harbour and the Study Area is demonstrating a supply-led market including signs of decreasing affordability and more limited choice in available residential product. It is important to ensure the timely delivery of residential land to maintain confidence in the residential market and in the ongoing delivery of affordable residential lifestyles for the Coffs Harbour community. A 7 to 8 year lead time is critical in ensuring sufficient residential land supply is available in maintaining affordability and confidence in the local residential market.

Underlying demand drivers are indicative of increasing population growth and demand for residential lifestyles in Coffs Harbour and the Study Area, bringing forward population projections and dwelling demand within the Study Area.

It is estimated that there is only 3 years of supply available to the market within the Study Area, including land that is currently not being developed and subject to owner intents and commercial viabilities.

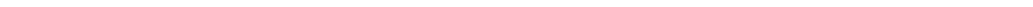
Whilst the timeframe for approval and development of the subject site may not see the creation and release of lots until 2019, the existing supply of residential land and high potential proposed developments in Woolgoolga, dictates that the subject site would be able to contribute to land supply and housing affordability within Coffs Harbour and Woolgoolga significantly prior to the existing post-2031 planning horizon.

More particularly there is compelling demand to bring forward the supply of well located, residential land that will deliver affordable lifestyles for the Woolgoolga Study Area and wider Coffs Harbour community.

The subject site is a sequentially superior residential development site within the Woolgoolga area, and best positioned to accommodate demand within the locality, compared with other planned growth areas, whilst offering prospective residents proximity and accessibility to services and maximising the commercial viability of the catchments for the nearby retail and commercial centres.

Significantly, the location of the subject property, its capacity to be developed as a masterplanned community and its topography, contribute to the commercial viability of the subject property to deliver affordable lifestyles for the Woolgoolga community, relative to other less well located and developable designated sites within the Study Area.

# Appendix C ~ Preliminary Vegetation Management Plan





# Preliminary Vegetation Management Plan

Newmans Road  
September 2018

Vadejil Pty Ltd

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## Glossary, acronyms and abbreviations

APZ	Asset Protection Zone
CHCC	Coffs Harbour City Council
DBH	Diameter at breast height
DCP	Development Control Plan
IBRA	Interim Biogeographical Regionalisation of Australia
IPA	Inner Protection Area
KFT	Koala feed tree
LGA	Local Government Area
OPA	Outer Protection Area
SERA	Society for Ecological Restoration Australasia
TEC	Threatened ecological community
TPZ	Tree Protection Zone
VMP	Vegetation management plan

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# 1 Introduction

This preliminary Vegetation Management Plan (VMP) is for part of Lot 202 DP874273 (the site), being the southern precinct of the lot in Woolgoolga, west of the Pacific Highway and 30 km north of Coffs Harbour, New South Wales. The site borders Newmans Road (9.23 ha) (Figure 1). This VMP is intended to contribute to a planning proposal for the subject land. The concept design for the preliminary proposal for re-zoning is provided in Appendix 1.

The northern precinct (part of Lot 202 DP874273) is the subject of a separate application and does not form part of this VMP.

The VMP draws upon information provided in Coffs Harbour City Council's (CHCC) Development Control Plan (DCP) 2015, Appendix 2 Guidelines for preparing vegetation management plans, as well as the Australian Standard AS4970-2009 Protection of trees on development sites. Restoration principles have been adopted in accordance with the National standards for the practice of ecological restoration in Australia (SERA). This report should be read in conjunction with the ecological assessment (Ecosure 2017).

## 1.1 Site description

The study site, is bounded to the north by Poundyard Creek and council owned land currently being developed for the purposes of a community sports field. The entry adjoins Newmans Road as part of west Woolgoolga.

Ecological features of the site include an area of wet sclerophyll forest along the northern boundary which is mapped as secondary koala habitat (CHCC). This connects to Poundyard Creek and flows to Woolgoolga Lake (Ecosure 2018). Connecting Poundyard Creek and the large freshwater wetland located outside the southern boundary is a patch (approximately 500 m<sup>2</sup>) of brushbox (*Lophostemon confertus*), turpentine (*Syncarpia glomulifera*) and a few large diameter tallowwoods (*Eucalyptus microcorys*). This area of remnant vegetation is mapped by CHCC as dry sclerophyll forest. Tallowwood is recognised as an important koala food tree (KFT). The remainder of the site consists of individual native trees, and exotic grassland, shrubs and trees.



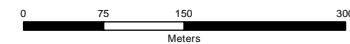
**Figure 1: Site location**

Vadejil Pty Ltd  
 Newmans Road VMP

 Project area



Job number: PR3278  
 Revision: 0  
 Author: DJB, KF  
 Date: 28/08/2018



GDA 1994 MGA Zone 56  
 Projection: Transverse Mercator  
 Datum: GDA 1994  
 Units: Meter

## 1.2 Aims and objectives

This VMP aims to:

- retain mapped koala habitat and remnant vegetation on the site
- provide linkages of remnant vegetation on the site with extant vegetation to provide suitable wildlife corridors
- provide details of how vegetation is to be retained and managed during construction works including the identification of vegetation management zones
- identify the targets, goals and objectives to monitor progress of the rehabilitation areas over time
- to progress each vegetation management zone as far as possible towards full recovery, relative to an appropriate local indigenous reference ecosystem.

The objective of the VMP is to maximise the ecological value of the site by:

- enhancing habitat value in proposed E3 zoned areas as per the design drawings through planting of appropriate species i.e. 'gap filling', connectivity plantings and weed control
- utilising koala feed trees in appropriate areas
- identifying areas for buffer zones around remnant vegetation
- identifying areas for weed control and maintenance activities.

## 2 Vegetation management

In urban and urban fringe areas, wildlife corridors are smaller, less defined linkages that provide local connections of vegetation for wildlife movement. They can consist of creek lines, wetlands, large single trees, or ridgelines, and are an important component of an overall regional landscape conservation framework as outlined in *Landscape Corridors of the Coffs Harbour Local Government Area Final Report May 2015* (CHCC 2015).

The site contains areas of native vegetation that contribute to the local connectivity network linking wildlife habitat through both corridors and stepping stones, forming a locally derived network that is nested within regional, state and continental wide connectivity conservation planning.

Based on the Society for Ecological Restoration Australasia (SERA) 2017 standards, the primary objective of vegetation management will be to ensure that adjacent threats are being managed or mitigated and to ensure a very low threat from undesirable species on site. Using the SERA one to five star recovery wheel the intention for this site overall is to reach level 3 to 5, depending on the restoration area (See Appendix 2 for a review of the five star recovery levels based on the SERA standards). A survey conducted on 6 December 2017 observed that a moderate subset of characteristic weed species such as lantana (*Lantana camara*), setaria grass (*Setaria sphacelata*), winter senna (*Senna pendula* var. *glabrata*) and groundsel bush (*Baccharis halimifolia*) are established on the site.

The site already has some baseline evidence of ecosystem functionality with good connectivity and enough remnant vegetation to establish an ongoing seed source for natural regeneration. While the proposed development will impact some of these values it is expected that the areas to be protected will remain viable and be better connected. Based on these observations, the respective restoration areas will quickly reach level 3 – 5 on the recovery wheel through the vegetation management actions as described in this plan.

### 2.1 Vegetation management zones





The site has been divided into two management zones. Each management zone will require rehabilitation to improve connectivity between remnant patches of vegetation, as well as planting within existing patches to develop ecosystem resilience and enhance biodiversity. Weed control will also be conducted in both zones (refer to Section 4). The key areas of ecological value identified in the ecological assessment (Ecosure 2017) are proposed to be retained as E3 – Environmental Management

These areas have been identified as linkages and refuges for wildlife with important habitat value. Asset protection zones (APZ) should avoid proposed E3 zoned areas where possible. If this is impractical, only the Outer Protection Area (OPA) should encroach in to this zone (See Section 3). Indicative APZ setbacks specified in the bushfire report for the subject land (Holiday Coast Bushfire Solutions 2018) are shown in Figure 2. Weed control must be applied in both zones (see Section 4).



**Figure 2: Vegetation management zones and APZ requirements**

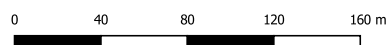
Vadejil Pty Ltd  
Vegetation Management Plan

-  Site boundary (Part lot 202 DP874273)
-  Proposed E3 Zone
-  APZ
-  Biolink

*Note – there may be spatial misalignment between lot boundaries and underlying imagery*



Job number: PR3278  
Revision: 0  
Author: JLY  
Date: 28/08/2018



GDA 1994 MGA Zone 56  
Projection: Transverse Mercator  
Datum: GDA 1994  
Units: Meter

### 2.1.1 Enhancement and connectivity planting

Remnant vegetation has been divided up into two zones (Table 1). Zone 1 and Zone 2 (biolink) are mapped as wet sclerophyll forest. Enhancement planting should be undertaken using appropriate species and densities for each zone outlined below and in Table 2.

Table 1 Details of planting zones

Zone	Location	Area (ha)	Vegetation community
1	North eastern boundary with Poundyard Creek in the southern precinct	0.62	Wet sclerophyll forest
2	Biolink	0.77	Dry sclerophyll forest

Revegetation and enhancement planting will incorporate koala feed trees where possible. Tubestock will be used for revegetation and should be sourced from a nursery specialising in local provenance species.

Planting density for trees and shrubs should be one per 4 m<sup>2</sup> or greater to ensure compliance with bushfire requirements, and one groundcover or grass every 1 m<sup>2</sup>. These densities will allow for improved ecological value and accommodate planting requirements. Planting densities can be reduced or eliminated where APZs apply.

#### Zone 1

This zone includes a linear area of wet sclerophyll forest along the northern boundary of the site and connects to remnant vegetation associated with Poundyard Creek. This area is mapped by CHCC as secondary koala habitat. Enhancement planting will be undertaken using species outlined in Table 2.

Zone 1 may require some bushfire fuel management to ensure APZs are appropriately maintained to protect proposed future dwellings to the south.

#### Zone 2 (biolink)

This zone represents an area of mapped dry sclerophyll forest (CHCC). It is located in the centre of the site and includes a patch of large, mature native trees that provide a linkage between remnant vegetation toward Poundyard Creek and a large freshwater wetland outside the southern boundary. Enhancement planting should include species outlined in Table 2.

The biolink may require some bushfire fuel management to ensure APZs are appropriately maintained to protect future dwellings that surround this zone.

Table 2 Planting species list for enhancement and connectivity planting in management zones

Scientific name	Common name	Layer	Height	Growth rate	Habitat values/comments
<b>North Coast Dry Sclerophyll Forest</b>					
<i>Acacia irrorata</i>	Green wattle	Midstorey	4-12 m	F	Flowers following good rain providing nectar for insects. Sap eaten by Sugar Gliders. Fast growing hardy tree, well suited to revegetation sites.
<i>Allocasuarina torulosa</i>	Forest Oak	Mid storey	12 m	M	Cones a major food source for Glossy Black Cockatoo
<i>Angophora costata</i>	Smooth-barked Apple	Canopy	25 m	F	Older trees readily develop hollows. Flowers late spring/early summer. Important nectar resource for insects, birds and arboreal mammals.
<i>Corymbia intermedia</i>	Pink bloodwood	Canopy	30 m	F	Flowers in summer. Important nectar resource for insects, birds and arboreal animals. Sap provides food resource for sugar gliders. Older trees readily develop hollows.
<i>Cymbopogon refractus</i>	Barbed Wire Grass	Ground layer			
<i>Dianella caerulea</i>	Blue Flax-lily	Ground layer			
<i>Davesia ulicifolia</i>	Gorse Bitter Pea	Understorey			
<i>Eleocarpus reticularis</i>	Blueberry ash	Mid storey	12 m	M	Blue berries attractive to a range of frugivorous birds. Germination is difficult. Often grown from cuttings.
<i>Eucalyptus pilularis</i>	Blackbutt	Canopy	60 m	F	Important nectar and pollen resource for a range of animals, birds and insects. Older trees have many hollows. Slightly susceptible to Myrtle Rust. Koala feed tree.
<i>Eucalyptus propinqua</i>	Small-fruited grey gum	Canopy	30 m	F	Koala feed tree.
<i>Glochidion ferdinandi</i>	Cheese Tree	Mid storey	10 m	F	Small red seeds are consumed by a number of birds. Excellent pioneer species for revegetation sites.
<i>Hibbertia scandens</i>	Climbing Guinea Flower	Understorey			

Scientific name	Common name	Layer	Height	Growth rate	Habitat values/comments
<i>Imperata cylindrica</i>	Blady Grass	Ground layer			
<i>Leucopogon pimeleoides</i>	Beard Heath	Understorey	3 m	S	Small red fruit eaten by birds. Very difficult to germinate but cuttings strike.
<i>Lomandra longifolia</i>	Spiny-headed Mat-rush	Ground layer			
<i>Persoonia stradbrogensis</i>	Geebung	Midstorey	5 m	F	Often pollinated by native short-tongued Leioproctus bees. Fruits eaten by a variety of birds. Difficult to propagate.
<i>Pultenaea villosa</i>	Hairy bush-pea	Understorey	2 m		Germinates and restores soil nitrogen after fire.
<i>Syncarpia glomulifera</i>	Turpentine	Canopy	20 m		Flowers in spring. Nectar resource for insects and birds. Young growth very susceptible to Myrtle Rust.
<i>Themeda triandra</i>	Kangaroo Grass	Ground layer			

#### North Coast Wet Sclerophyll Forest

<i>Acacia irrorata</i>	Green wattle	Midstorey	4-12 m	F	Flowers following good rain providing nectar for insects. Sap eaten by Sugar Gliders. Fast growing hardy tree, well suited to revegetation sites.
<i>Acacia melanoxylon</i>	Blackwood	Mid storey			
<i>Allocasuarina torulosa</i>	Forest Oak	Mid storey	12 m	M	Cones a major food source for Glossy Black Cockatoo
<i>Angophora costata</i>	Smooth-barked Apple	Canopy	25 m	F	Older trees readily develop hollows. Flowers late spring/early summer. Important nectar resource for insects, birds and arboreal mammals.
<i>Breynia oblongifolia</i>	Coffee Bush	Mid storey	3 m	M	Pollinated by a single species of moth from the family Gracillariidae. Food plant for the Large Grass Yellow butterfly. Ripe berries eaten by a range of birds.
<i>Cordyline stricta</i>	Slender Palm Lily	Mid storey	5 m		Adaptable species growing on swampy as well as well drained sites.
<i>Cryptocarya glaucescens</i>	Jackwood	Canopy	20 m	S	Purple-black drupes attract numerous frugivorous birds.



Scientific name	Common name	Layer	Height	Growth rate	Habitat values/comments
<i>Dianella caerulea</i>	Blue Flax-lily	Ground layer			
<i>Eucalyptus microcorys</i>	Tallowwood	Canopy	30 m	F	Koala feed tree.
<i>Eucalyptus tereticornis</i>	Forest Red Gum	Canopy	30 m	F	Koala feed tree.
<i>Eucalyptus pilularis</i>	Blackbutt	Canopy	60 m	F	Important nectar and pollen resource for a range of animals, birds and insects. Older trees have many hollows. Slightly susceptible to Myrtle Rust.
<i>Lomandra longifolia</i>	Spiny-headed Mat-rush	Ground layer			
<i>Lophostemon confertus</i>	Brush Box	Canopy	30 m	F	
<i>Polyscias sambucifolia</i>	Elderberry Panax	Mid storey			
<i>Syncarpia glomulifera</i>	Turpentine	Canopy	20 m	M	Flowers in spring. Nectar resource for insects and birds. Young growth very susceptible to Myrtle Rust.

### 3 Tree protection measures

Prior to any machinery arriving at the site, tree protection fencing is to be installed around the tree protection zone (TPZ) of trees to be retained. Where groups of trees are being retained, the fencing can be around the group rather than each single tree.

The tree protection fencing can be either:

- High visibility power webbing/mesh installed with 1500 mm stakes with 3 m centres, or;
- Rope flagging installed with 1500 mm stakes at 3 m centres.

Signs should be installed intermittently (at high visibility locations) stating that the fenced area is a TPZ. Once installed, fencing is not to be removed or altered until works with machinery have ceased, or access is required for rehabilitation purposes. In accordance with AS 4970 – 2009 (Protection of trees on development sites), the following activities are not permitted within the fenced off tree protection area:

- trenching or excavation
- placing of fill or sediment
- installation of sediment fencing
- cultivation activities, or parking of vehicles or plant
- storage of items
- mixing, storage or preparation of chemicals
- machine or equipment wash downs or cleaning
- damage to vegetation
- any other activity detrimental to the ongoing health of the tree or vegetation to be retained.

In accordance with AS 4970-2009, the TPZ is calculated at 12 x diameter at breast height (DBH). All personnel are to be briefed at the site induction on the tree protection locations and other relevant information, including the fact that the fencing is not to be removed. Fencing inspections are to be included on the supervisor's daily inspection sheet and maintained as required. Trees to be removed are to be felled away from any TPZ.

## 4 Weed management

Weeds species identified on the site within the vegetation management zones are to be managed in accordance with the *Biosecurity Act 2015* (the Act) which came into effect on 1 July 2017 and repeals various pieces of legislation including the *Noxious Weeds Act 1993*. Under the Act, weed management applies to all land whether government or privately owned (NCLLS 2017). Priority weeds and landholder responsibility for management and control have been identified in Schedule 3 of the Act.

Species identified on site and listed as priority weeds in the North Coast Local Land Service area in the regional plan (NCLLS 2017) include groundsel bush (*Baccharis halimifolia*) and lantana (*Lantana camara*). A weed species list is provided (Appendix 3). Management categories within the regional plan and relevant to the site include 'containment' and 'asset protection', while plants that are state listed are also included (Tables 3 - 5).

Table 3 Priority weed species under the *Biosecurity Act 2015* identified on site (DPI 2017)

Weed	Duty of landholder
groundsel bush	<p>Regional Recommended Measure: Exclusion zone: whole region excluding the core infestation area of Richmond Valley Council, Ballina Shire Council, Lismore Council, Kyogle Council, Byron Shire Council and Tweed Shire Council.</p> <p>Whole region: The plant or parts of the plant should not be traded, carried, grown or released in the environment. Exclusion zone: Land managers should mitigate the risk of spread of the plant from their land. Land managers should mitigate the risk of the plant establishing on their land. Core infestation: Land managers should reduce impacts from the plant on priority assets.</p>
lantana	Must not be imported into the State or sold.

Table 4 Management categories applicable for weeds at the site

Category	Objective	Characteristic
Containment	To prevent the ongoing spread of the species in all or part of the region	These species have a limited distribution in the region. Regional containment strategies aim to prevent spread of the weed from an invaded part of the region (core infestation), and/or exclude the weed from an uninvaded part of the region (exclusion zone).
Asset protection	To prevent the spread of weeds to key sites/assets of high economic, environmental, and social value, or to reduce their impact on these sites if spread has already occurred.	These weed species are widespread and unlikely to be eradicated or contained within the wider regional context. Effort is focussed on reducing weed threats to protect priority value assets.

Table 5 Weed species and management category for priority weeds (NCLLS 2017).

Common name	Scientific name	Zone 1	Zone 2 (Biolink)	Management Category
groundsel bush	<i>Baccharis halimifolia</i>	X	X	Containment
lantana	<i>Lantana camara</i>	X	X	Asset protection
camphor laurel	<i>Cinnamomum camphora</i>	X		Asset protection
asparagus fern	<i>Asparagus aethiopicus</i>		X	Asset protection

Weed control will be undertaken in both management zones and is required in the early stages of revegetation works and generally every three months for the first 24 months. After approximately two years weed control will only be required on an on-going as-needs basis. All personnel engaged in chemical weed control would be expected to have attained a minimum AQF III level in Chemical Application as well as a minimum of Certificate III in Conservation and Land Management (Natural Area Restoration) plus 500 hours of practical bushland regeneration under an experienced supervisor. Supervisors would be required to have at least some supervisory experience, preferably a higher qualification (AQF IV or V) and a minimum of 700 hours bush regeneration experience. Preferably, lead supervisors should also be a member of the Australian Association of Bush Regenerators (AABR).

Works will preferably need to be undertaken by a suitably qualified contractor with Australian Association of Bush Regenerators membership. They will need to specialise in ecological restoration and have relevant experience in weed control, revegetation, plant identification, site management and on-going monitoring/maintenance works.

## 4.1 Weed treatment methods

### Cut-scrape-paint method (CS&P)

This method applies to all woody shrubs, trees and some vines.

Cut plant low to the ground (approx. 1–2 cm above soil level) and level so herbicide does not run off. Cut stems are less hazardous to workers who may kneel on the ground at a later date. Apply herbicide immediately at the suitable rate with a paintbrush approximately 1.5 cm wide. Scrape 3-4 sides of the remaining stump lightly to reveal green tissue and apply the herbicide to the scraped area. Take care that the brush is not contaminated with soil.

**Note** all seed that has high viability and longevity should be removed from the parent and removed from the site e.g. *Senna* spp. and other members of the Fabaceae family with large seed pods or plants with a high invasive potential such as moth vine (*Araujia sericifera*).

**Note** larger trunks, stems or tubers should be scraped and painted in sections as cells quickly shut down once exposed preventing the translocation of herbicide.

### Gouge-paint method

This method applies to those plant species that have a fleshy root system such as rhizomes

or large bulbs. It is particularly appropriate for the treatment of Kahili ginger (*Hedychium gardnerianum*) or canna lily (*Canna indica*) but can also be applied to prickly pear (*Opuntia spp.*), if each cladode (flattened stem) is treated.

1. Cut the stems of the plant at head height and then at ground level. The stems are then cut up and spread over the ground to act as part of the leaf litter. Gouge out sections of the fleshy base with a knife. Apply herbicide at the recommended rate with a paintbrush approximately 1.5 cm wide avoiding contact with soils.

### **Stem Injection method**

This method applies to all woody trees and shrubs with a diameter of about 6-10 cm or greater and is suited to umbrella trees and camphor laurel on site.

1. With a tomahawk make a cut the width of the blade at an angle of about 45 degrees into the trunk.
2. Apply herbicide at recommended rate immediately into the cut using a tree injecting device.
3. Repeat this procedure in a brickwork pattern around the circumference of the tree as close to the ground as possible. Where the presence of a crotch angle makes this difficult make a cut above it. Ensure cuts are also made on the inside of forks. This may need to be done with a Drill, Hand Saw or Chisel. Note two rows of cuts will be sufficient for trees with trunks of 6-10 cm. Larger trunk diameters will need correspondingly more.
4. Treat all visible lateral roots as per 1 and 2.

**Note** stem injection can also be carried out using a drill. Holes can be inserted approximately 10 cm apart and filled with the appropriate herbicide. Lateral roots should also be drilled and filled with the appropriate herbicide. It is also essential that stem injection is not applied to umbrella trees while in flower as herbicide may be translocated to flowers and affect birds feeding on nectar.

### **Scrape and paint method**

This method is applicable to many species of vines where it is desirable to treat the vines intact, particularly those with aerial tubers such as Madeira vine (*Anredera cordifolia*) or those that will propagate from segments e.g. Cape ivy (*Delairia odorata*).

1. Remove and bag tubers before scraping to avoid dislodging them during treatment.
2. Scrape the stem tissue on one side of the stem only for up to 100cm if possible before leaving a small gap (approx. 5 cm) and changing sides. Note: on Madeira vine it's necessary to scrape heavily, to expose white inner tissue. Scrape as much of the stem as possible.
3. Apply undiluted Glyphosate with a paintbrush within 7 seconds of scraping the stem i.e. scrape and paint in sections.
4. In the case of *Anredera cordifolia* (madeira vine) it is essential that ground tubers and lateral roots are also treated with a heavy scrape and paint. If the tuber is of substantial

size a gouge can be made into the tuber with a knife and apply herbicide. Any side roots must also be scraped and painted.

### Spot spraying method

This is carried out using a 15 litre backpack spray unit with a modified spray nozzle that gives an accurate and easily adjustable spray pattern e.g. Rega®. It is advised to fill up the backpack to 10 litres only, to avoid back strain, particularly where spraying for extended periods. Glyphosate and metsulfuron methyl are the main herbicides used with the addition of a marker dye. A surfactant such as Pulse® is added in some treatments to assist the transfer of the herbicide through the surface tissue – particularly plants with waxy leaves, such as camphor laurel, Madeira vine and trad. Additives such as Pulse or herbicides such as metsulfuron methyl may need to be avoided in some areas (i.e. low-lying areas or at certain times of the year (e.g. when frogs are breeding)).

### Overspray method

This method is applicable to large, dense infestations of such plants as lantana (*Lantana camara*). This method may be used where it is desirable to leave partially dead or dead plants intact to prevent erosion and over exposure of large areas, provide habitat and protect native seedlings from predators such as wallabies. Avoid trampling to retain habitat, identify an edge (e.g. to prevent machinery from impacting the site) and to save on resources.

Spray over the top of the infestation when the plant is actively growing (i.e. not stressed) using a solution of water and herbicide at the recommended rate. **Note** any native plants that may be under the weed may need to be protected by preparing or cutting the lantana away from native plants. The type of spray pattern and density of foliage cover of the weed will need to be assessed. Leave the sprayed plants intact so that native seedlings can establish under the shelter provided.

## 4.2 Weed control methods

### Ratios for application of herbicide

Dilution ratios for the application of herbicide are provided in the table below. Always read and follow the directions on the product label and obtain a Safety Data Sheet for each chemical and additive. For some weeds a combination of glyphosate and metsulfuron-methyl (such as Associate®) is recommended, permitted under APVMA off-label permit numbers PER 11463 and PER 11371. A surfactant such as Pulse® is added in some treatments to assist the transfer of the herbicide through the surface tissue – particularly plants with waxy leaves, such as camphor laurel, Madeira vine and trad.

## Abbreviations and application rates

Table 6 Abbreviations commonly used in weed control techniques and recommended application rates

Common name	Scientific name	Control method
broad-leaf paspalum	<i>Paspalum mandiocanum</i>	Spray 1:100 Gly + O + dye. Can be hand weeded and left in-situ.
camphor laurel	<i>Cinnamomum camphora</i>	Hand pull seedlings or spray 1:50 Gly + S + dye or for better results spray 1:50 Gly + 1.5 g MM:10L water + S + dye. Saplings CS&P Gly 1:1.5. Trees stem inject 1:1.5 Gly.
cobbler's pegs	<i>Bidens pilosa</i>	Spray 1:100 Gly + O + dye
groundsel bush	<i>Baccharis halimifolia</i>	Hand pull seedlings. Saplings and trees CS&P 1:1.5 Gly. Spray seedlings/regrowth 1:50 Gly + O + dye
lantana	<i>Lantana camara</i>	Lopper, then CS&P bases 1:1.5 Gly. Spot spray regrowth and overspray large infestations 1:100 Gly + O + dye. Red flowering species will require a rate of 1: 50 Gly + O + dye. Splatter gun method Gly 1:9 (1 part Gly to 9 parts water) + dye (best results when plants actively growing).
purpletop	<i>Verbena bonariensis</i>	Spray 1:50 Gly + O + dye
senna	<i>Senna pendula</i> var. <i>glabrata</i>	Spot spray seedlings 1:50 Gly + S + dye. CS&P medium plants 1:1.5 Gly. Stem inject large specimens 1:1.5 Gly. (bag seed pods and dispose off site)
whisky grass	<i>Andropogon virginicus</i>	Spray 1:50 Gly + O + dye if sufficient active growth; Crown smaller infestations
umbrella tree	<i>Schflerra actinophylla</i>	Spray 1:50 Gly + O + dye; seedlings can be hand weeded; CS&P medium plants 1:1.5 Gly. Stem inject large specimens 1:1.5 Gly (not if in flower)

## 5 Monitoring and ongoing maintenance

Maintenance of revegetation works should occur six months after initial planting with ongoing maintenance occurring annually for a period of five years to ensure a successful level of plant establishment.

Maintenance activities in the management zones will include:

- Planting
- Watering
- Weed control (see Section 4 above)
- Replacement of lost plants (if losses are greater than 20%)
- Mulching (if required).

For each of the management zones, a restored state will be considered to have been achieved when each management zones attributes are on a secure trajectory approximating those of the target ecological reference community (star rating - see table in Appendix 2). The objectives of the VMP will be achieved if no further repair-phase interventions are required. Following this phase, the relevant management zone under recovery would be considered 'self-organising' and increasingly resilient to natural disturbances. Table 7 below indicates the current star rating for each management zone and its predicted rating at the completion of management in five years.

Table 7 Targets and criteria for each management zone for Newmans Road over five years

Management zone	Current star rating	Year 5
Zone 1 (rehabilitate)	2	4
Zone 2 (enhance) - Biolink	3	4



## 6 Conclusion

The Newmans Road site contains areas of remnant vegetation that have important ecological values that contribute to local biodiversity and the local landscape connectivity network. This VMP outlines how these areas will be improved by drawing upon relevant documents that will successfully guide rehabilitation by enhancing habitat quality and increasing linkages across the site. This document should be read in conjunction with the ecological assessment (Ecosure 2018) and bushfire hazard assessment report (Holiday Coast Bushfire Solutions 2018).

This VMP also provides details of how the site is to be managed during construction and identifies the targets and objectives to monitor progress of rehabilitation of the site over time. These restoration principles have been adopted in accordance with the National Standards for the practice of ecological restoration in Australia. Restoration together with planned revegetation works and ongoing weed control and maintenance will further aid in improving the ecological value of the site and assist in mitigating any impacts that arise from vegetation removal on site.

## References

Australian Association of Bush Regenerators (AABR) Guidelines  
<http://www.aabr.org.au/Learn/Professional Practice/Management Guides/>

CHCC 2013, *Local Environmental Plan*, Coffs Harbour City Council.

CHCC 2015, *Landscape Corridors of the Coffs Harbour Local Government Area*. Coffs Harbour City Council, Coffs Harbour, New South Wales.

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DPI 2017, Department of Primary Industries NSW, accessed at <http://weeds.dpi.nsw.gov.au/WeedBiosecurities?Areald=19> on 6 June 2018

Ecosure 2018, *Newmans Road Ecological Assessment*, Final Report to Keiley Hunter Urban Planner, Publication Location – Coffs Harbour

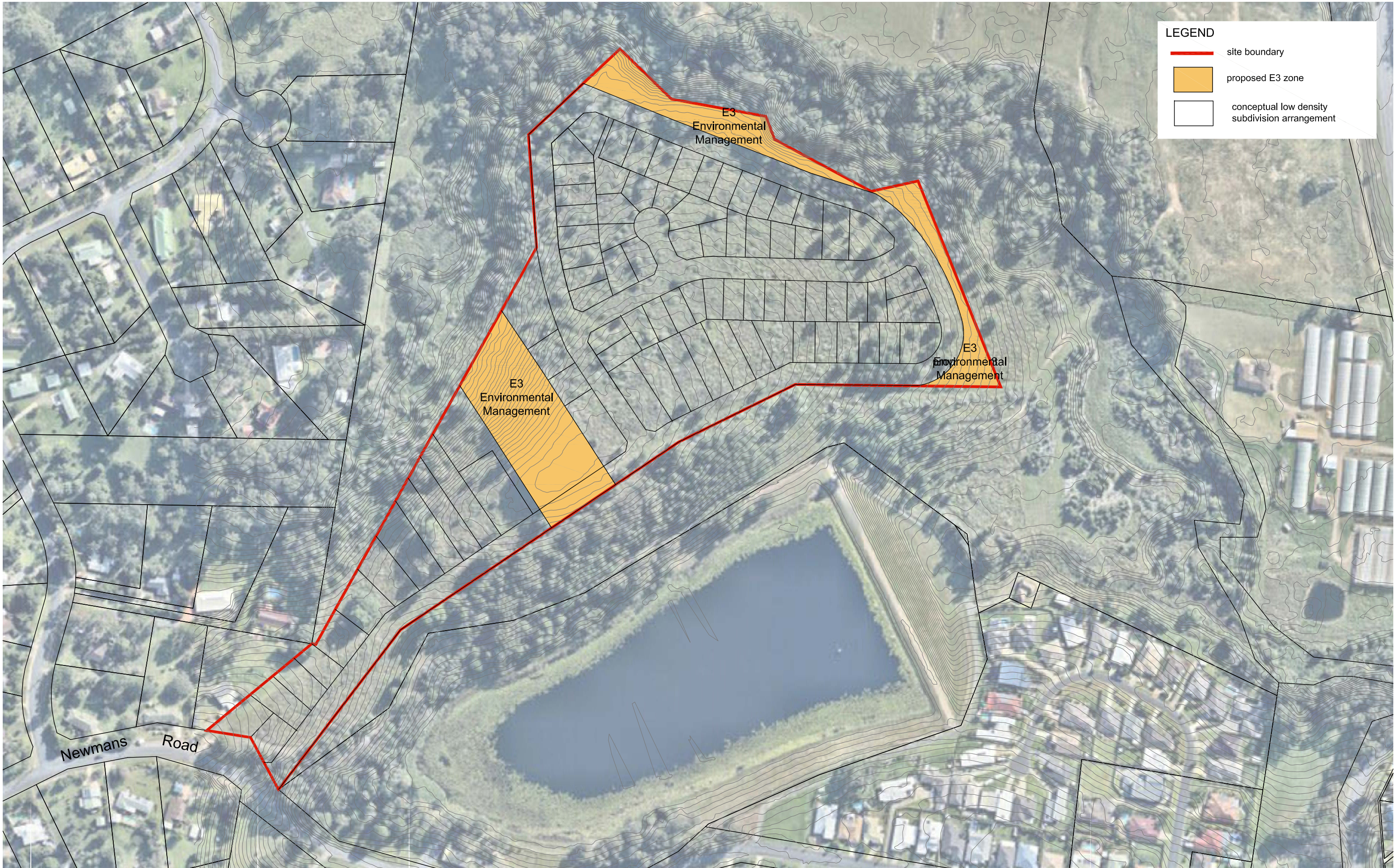
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NCLLS 2017, North Coast Local Land Service, *Regional Strategic Weed Management Plan 2017 – 2022*, State of NSW

'Standards Reference Group SERA 2017, *National Standards for the Practice of Ecological Restoration in Australia*. Second Edition. Society for Ecological Restoration Australasia. Available from URL: [www.seraustralasia.com](http://www.seraustralasia.com)

Stehn C., 2015, *A guide to species selection for revegetation projects in the Coffs Harbour Local Government Area*, Coffs Harbour City Council, New South Wales, Australia.

# Appendix 1    Concept design



**LEGEND**

- site boundary
- proposed E3 zone
- conceptual low density subdivision arrangement

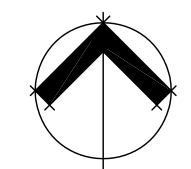
Use figured dimensions in preference to scales. Please notify the Landscape Architect before proceeding if any anomaly is found between this drawing and conditions on site. This drawing must not be relied upon for any purpose other than that for which it was prepared or by any person or corporation other than the referred client.

AMENDMENTS			
Issue	Date	Details	Initial
A	22.2.18	Client review	JA
B	11.5.18	amended for Asset Protection Zones	JA
C	11.5.18	amended as per DGB feedback	JA
D	3.7.18	E3 zone added	JA
E	11.9.18	planning proposal	JA

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<b>PLANNING PROPOSAL</b>	
<b>CLIENT</b>	Keiley Hunter Urban Planner

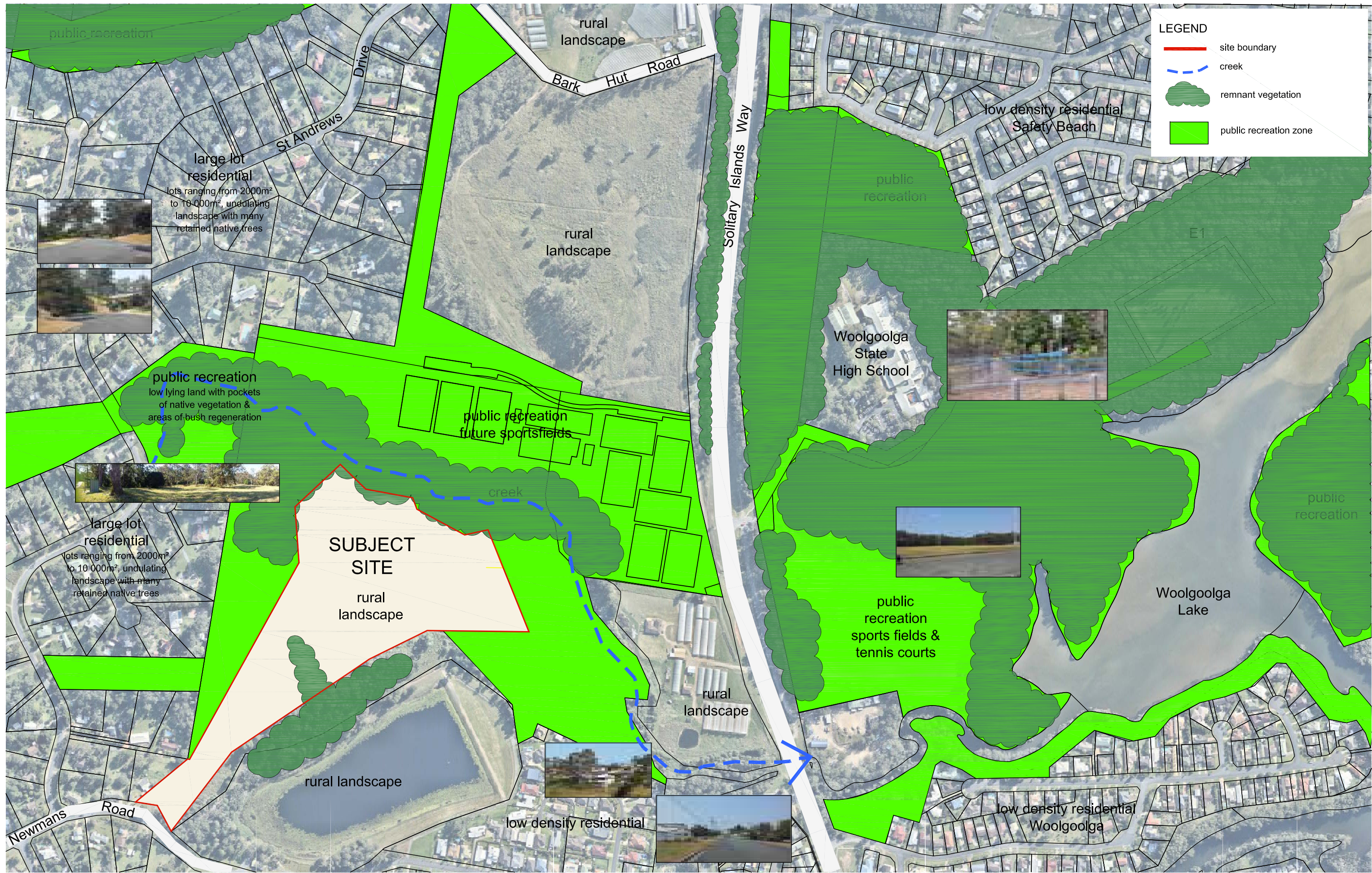
<b>DRAWING</b>	Planning Proposal
	Proposed Subdivision Layout Newmans Rd
<b>DRAWING NO.</b>	1730-06

<b>DRAWN</b>	JA
<b>ISSUE</b>	E
<b>DATE</b>	September 2018



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Use figured dimensions in preference to scales. Please notify the Landscape Architect before proceeding if any anomaly is found between this drawing and conditions on site. This drawing must not be relied upon for any purpose other than that for which it was prepared or by any person or corporation other than the referred client.

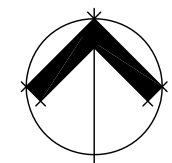
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Issue	Date	Details	Initial
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B	11.9.18	planning proposal	JA

**PROJECT**  
Bark Hut Road, Woolgoolga  
**PLANNING PROPOSAL**  
**CLIENT**  
Kelley Hunter Urban Planner

**DRAWING**  
Planning Proposal  
Site Context  
**DRAWING NO.**  
1730-01

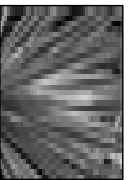
**DRAWN**  
JA  
**DATE**  
September 2018

**ISSUE**  
B



Scale 1:5000 @ A3  
metres 0 25 50 75 100 125

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## Appendix 2 Summary of generic standards for one to five star recovery levels

Number of stars	Recovery outcome modelled on an appropriate local indigenous ecological reference
1	Ongoing deterioration prevented. Substrates remediated (physically and chemically). Some level of indigenous biota present; future recruitment niches not negated by biotic or abiotic characteristics. Future improvements for all attributes planned and future site management secured
2	Threats from adjacent areas starting to be managed or mitigated. Site has a small subset of characteristic indigenous species and there is low threat from undesirable species on site. Improved connectivity arranged with adjacent property holders.
3	Adjacent threats being managed or mitigated and very low threat from undesirable species on site. A moderate subset of characteristic indigenous species are established and evidence of ecosystem functionality commencing. Improved connectivity in evidence.
4	A substantial subset of characteristic biota present (representing all species groupings), providing evidence of a developing community structure and commencement of ecosystem processes. Improved connectivity established and surrounding threats being managed or mitigated.
5	Establishment of a characteristic assemblage of biota to a point where structural and trophic complexity is likely to develop without further intervention other than maintenance. Appropriate ecosystem exchanges are enabled and commencing and high levels of resilience is likely with return of appropriate disturbance regimes. Long term management arrangements

Note 1: Each level is cumulative

Note 2: The different attributes will progress at different rates

Ref: National standards for the practice of ecological restoration in Australia (SERA 2017)

## Appendix 3 Weed list

Family Name	Scientific Name	Common Name
Apocynaceae	<i>Gomphocarpus physocarpus</i>	balloon cotton bush
Asparagaceae	<i>Asparagus aethiopicus</i>	asparagus fern
Asteraceae	<i>Ageratum conyzoides</i>	blue billygoat weed
Asteraceae	<i>Baccharis halimifolia</i>	groundsel bush
Asteraceae	<i>Bidens pilosa</i>	cobbler's pegs
Asteraceae	<i>Cirsium vulgare</i>	spear thistle
Asteraceae	<i>Tagetes minuta</i>	stinking roger
Convolvulaceae	<i>Ipomoea cairica</i>	mile-a-minute
Fabaceae (Caesalpinioideae)	<i>Senna pendula var. glabrata</i>	winter senna
Lauraceae	<i>Cinnamomum camphora</i>	camphor laurel
Passifloraceae	<i>Passiflora suberosa</i>	cork passionfruit
Passifloraceae	<i>Passiflora subpeltata</i>	white passionflower
Pinaceae	<i>Pinus elliottii</i>	slash pine
Poaceae	<i>Paspalum mandiocanum</i>	broadleaf paspalum
Poaceae	<i>Setaria sphacelata</i>	south African pigeon grass
Rutaceae	<i>Citrus limon</i>	bush lemon
Solanaceae	<i>Solanum mauritianum</i>	wild tobacco bush
Verbenaceae	<i>Lantana camara</i>	lantana
Verbenaceae	<i>Verbena bonariensis</i>	purpletop

## Revision History

Revision No.	Revision date	Details	Prepared by	Reviewed by	Approved by
00	31/08/20018	Preliminary Vegetation Management Plan Newmans Road	Trudy Thompson, Senior Environmental Scientist	Nigel Cotsell, Manager Coffs Harbour	Heather Richards, Regional Manager

## Distribution List

Copy #	Date	Type	Issued to	Name
1	12/09/2018	Electronic	Keiley Hunter Town Planning	Keiley Hunter
2	12/09/2018	Electronic	Ecosure	Administration

Citation: Ecosure (2018), Preliminary Vegetation Management Plan Newmans Road, Report to Vadejil Pty Ltd, Publication Location – Coffs Harbour

Report compiled by Ecosure Pty Ltd

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# ABORIGINAL CULTURAL HERITAGE ASSESSMENT REPORT

## BARK HUT ROAD REZONING



## WOOLGOOLGA, NSW

PREPARED FOR VADEJIL PTY LTD



**Report Reference:**

Hill, T, P. Fowler and T. Robins 2018 *Bark Hut Road Woolgoolga: Aboriginal Cultural Heritage Assessment*. Everick Heritage Consultants Pty Ltd. Unpublished report prepared for Vadejil Pty Ltd.

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## EXECUTIVE SUMMARY

This report provides the results of an Aboriginal Cultural Heritage Assessment for the proposed rezoning of land at Bark Hut Road, Woolgoolga NSW (the 'Project'). The lands subject to assessment include Lot 202 DP874273 and are approximately 25.55 hectares in area. The planning proposal is to rezone the land from RU1 Primary Production to R 2 Low density residential. The intent of the archaeological investigation is to identify Aboriginal and historical archaeological or cultural heritage constraints for the Project, and if found, establish ways in which any impacts could be mitigated or avoided. Everick Heritage Consultants (the 'Consultant') was commissioned by Keiley Hunter on behalf of Vadejil Pty Ltd (the 'Proponent') to undertake this assessment. It is understood that this assessment will be used in support of a Development Application to the Coffs Harbour City Council ('CHCC').

The brief for this Project was to undertake an Aboriginal and European heritage assessment of suitable standard to accompany the Development Application to the CHCC. In accordance with the relevant administrative and legislative standards for New South Wales (see Section 2 below), the methods employed in this assessment included:

- a) a search of relevant heritage registers;
- b) a site inspection undertaken by Senior Archaeologist Tim Hill on 1 March 2016;
- c) a review of the archaeological and cultural heritage assessments pertinent to the potential heritage values associated with the Project Area;
- d) review historical aerial photographs of the Project Area; and
- e) assessment of the potential for the Project Area to contain significant Aboriginal heritage and the impact on the Project may have on said heritage, consistent with the OEH *Due Diligence Code for the Protection of Aboriginal Objects in NSW* (2010).

As a result of the desktop study, field inspections, Aboriginal community consultation and archaeological investigation of the Project Area, the following was found.

- Two artefacts (Bark Hut Road IF 01 #22-1-0503 and Bark Hut Road IF 02 #22-1-0504) were observed on the access trail immediately south of the Bark Hut Road entrance to the Project Area. These consisted of stone flakes derived from Greywacke and Rhyolite, which are common in the Woolgoolga area. Given the location of the artefacts on an area of upper slope, it is likely that the artefacts are a secondary deposit from the main campsite, which is identified in the Council Reserve to the immediate west of the access road. This area will not be part of the rezoning application and as such this ridge crest was not surveyed.



- Having consideration for the landscape context of the Project Area and the history of disturbance it is considered unlikely that the Project Area will contain Aboriginal sites of high or moderate conservation value. The Project Area is unlikely to contain burials or middens and does not contain scarred or modified trees. Whilst some historic campsites are known in the general vicinity the Project Area none are known within the Project Area. No Mythological or ceremonial sites are known to occur within the Project Area, however it is noted that the ridge-crest may have been utilised as a pathway between the coast and hinterland.
- There is very little topsoil material in the upper slope and the artefacts were identified on the compacted surface of the trail. It is considered unlikely that the surrounding soils would contain Aboriginal objects. However, having consideration for the Due Diligence Code of Practice requirements the entire ridge crest is considered to be a Potential Archaeological Deposit (PAD). This includes a small ridge crest in the north-east corner of the Project Area.
- A second PAD was identified in the southern portion of the Project Area comprising a knoll to the west of the water storage dam however no Aboriginal objects were identified on the knoll. However, the presence of topsoil on the knoll provides an indication that there is the potential for an Aboriginal stone artefact scatter to occur on the knoll.

On the basis of the results and discussed above, the following management recommendations are provided:

### Recommendation 1: Cultural Heritage Induction

It is recommended that a cultural heritage induction is provided by representatives of the RAPs for all senior civil works staff involved in the initial removal of topsoil from the ridge crests identified by the ACHAR. This induction should provide;

- an overview of the nature and extent of archaeological materials within the Project Area;
- the broader cultural context of the site and its significance to Aboriginal people;
- an outline of relevant legislation; and
- an outline of the AHIP salvage procedure and an outline of an appropriate Finds Procedure.

### Recommendation 2: Application for an Aboriginal Heritage Impact Permit (AHIP)

It is recommended that prior to commencement of works (issue of Construction Certificate) that the proponent apply for an Aboriginal Heritage Impact Permit (AHIP) for salvage of known Aboriginal Objects from within the Project Area (Bark Hut Road IF 01 #22-1-0503 and Bark Hut Road IF 02 #22-1-0504). This AHIP should be subject to the following conditions relating to the salvage program:



- Cultural heritage induction for all ground clearance contractors.
- Collection of surface artefacts by Raps and temporary storage at CHDLALC.
- Monitoring of topsoil removal and collection of artefacts from the ridge crest and temporary storage at CHDLALC.
- The monitoring should be in an area 20m below the access track and along the apex of the ridge to the upper/ mid slope. All the way down to Creek.
- Permanent burial of artefacts within a reserve or garden area nearby.
- The monitoring should also include the ridge area in the north-east of the Lot.

### Recommendation 3: Southern PAD

It is noted that the site inspection did not identify any Aboriginal objects within the southern PAD area, defined by the knoll to the west of the water storage dam. Having consideration for the potential of this PAD to contain Aboriginal sites of high or moderate conservation value it is recommended that the minimum management response for this PAD is a cultural heritage induction and the application of an Aboriginal Find Procedure.

If it is suspected that Aboriginal material has been uncovered as a result of development activities within the Project Area:

- a) work in the surrounding area is to stop immediately;
- b) a temporary fence is to be erected around the site, with a buffer zone of at least 10 metres around the known edge of the site;
- c) an appropriately qualified archaeological consultant is to be engaged to identify the material; and
- d) if the material is found to be of Aboriginal origin, the Aboriginal community is to be consulted in a manner as outlined in the *ACHCRP Guidelines* (2010).

Should the material be identified as an Aboriginal object and the proposed works cannot be amended to avoid the Aboriginal site an Aboriginal Heritage Impact Permit (AHIP) would be required prior to recommencement of works in the vicinity of the site. Consultation with stakeholders from the Aboriginal community would be required as a part of the AHIP application process.

It is recommended that these requirements are formalised within a Cultural Heritage Management Plan agreed to by Registered Aboriginal Parties prior to issue for the Development Application for subdivision to allow an opportunity for RAPS to better consider the full impacts of proposed works.



#### Recommendation 4: Aboriginal Human Remains

Although it is unlikely that Human Remains will be located at any stage during earthworks within the Project Area, should this event arise it is recommended that all works must halt in the immediate area to prevent any further impacts to the remains. The Site should be cordoned off and the remains themselves should be left untouched. The nearest police station (Coffs Harbour), the Coffs Harbour Local Aboriginal Land Council and the OEH Regional Office (Coffs Harbour) are all to be notified as soon as possible. If the remains are found to be of Aboriginal origin and the police do not wish to investigate the Site for criminal activities, the Aboriginal community and the OEH should be consulted as to how the remains should be dealt with. Work may only resume after agreement is reached between all notified parties, provided it is in accordance with all parties' statutory obligations.

It is also recommended that in all dealings with Aboriginal human remains, the Proponent should use respectful language, bearing in mind that they are the remains of Aboriginal people rather than scientific specimens.

#### Recommendation 5: Conservation Principles

It is recommended that all effort must be taken to avoid any impacts on Aboriginal Cultural Heritage values at all stages during the development works. If impacts are unavoidable, mitigation measures should be negotiated between the Proponent, OEH and the Aboriginal community.



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## DEFINITIONS

The following definitions apply to the terms used in this report:

**Aboriginal Object** means any deposit, object or material evidence (not being a handicraft made for sale) relating to the [Aboriginal](#) habitation of the area that comprises New South Wales, being habitation before or concurrent with (or both) the occupation of that area by persons of non-Aboriginal extraction, and includes [Aboriginal remains](#).

**Aboriginal Place** means any place declared to be an Aboriginal place (under s.84 of the NPW Act) by the Minister administering the NPW Act, by order published in the NSW Government Gazette, because the Minister is of the opinion that the place is or was of special significance with respect to Aboriginal culture. It may or may not contain Aboriginal Objects.

**ACHCRP Guidelines** means the OEH *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (2010).

**AHIP** means Aboriginal Heritage Impact Permit

**Code of Practice** means the OEH *Code of Practice for Archaeological Conduct in New South Wales* (2010).

**Consultant** means qualified archaeological staff and/or contractors of Everick Heritage Consultants Pty Ltd.

**Development Area** means those lands within the Project Area subject to the Proposed Works.

**Due Diligence Code** means the OEH *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* (2010).

**LALC** means Local Aboriginal Land Council

**LEP** means the Local Environment Plan

**NPW Act** means the *National Parks and Wildlife Act 1974* (NSW).

**NPW Regulations** means the *National Parks and Wildlife Regulations 2009* (NSW).

**OEH** means the New South Wales Office of Environment and Heritage.

**Project** means the proposed future development of the Project Area for a low density residential subdivision.

**Project Area** means the land subject to this assessment being Lot 202 DP 874273, located at Bark Hut Road Woolgoolga NSW.

**Proposed Works** means all activities associated with proposed future ground disturbance within the Development Area, including activities undertaken by subsequent landholders.

**Proponent** means Vadejil Pty Ltd, and all associated employees and contractors and subcontractors of the same.



## 1. INTRODUCTION

### 1.1 Purpose of the Cultural Heritage Assessment

This report provides the results of an Aboriginal Cultural Heritage Assessment for the proposed rezoning of land at Bark Hut Road, Woolgoolga NSW (the 'Project'). The lands subject to assessment include Lot 202 DP874273 and are approximately 25.55 hectares in area (Figure 1). The planning proposal is to rezone the land from RU1 Primary Production to R2 Low density residential.

The intent of the archaeological investigation is to identify Aboriginal and historical archaeological or cultural heritage constraints for the Project, and if found, establish ways in which any impacts could be mitigated or avoided.

### 1.2 Proponent, Project Brief & Methodology

Everick Heritage Consultants (the 'Consultant') was commissioned by Keiley Hunter on behalf of Vadejil Pty Ltd (the 'Proponent') to undertake this assessment. It is understood that this assessment will be used in support of a Development Application to the Coffs Harbour City Council ('CHCC').

The brief for this Project was to undertake an Aboriginal and European heritage assessment of suitable standard to accompany the Development Application. In accordance with the relevant administrative and legislative standards for New South Wales (see Section 2 below), the methods employed in this assessment included:

- a) a search of relevant heritage registers;
- b) a site inspection undertaken by Senior Archaeologist Tim Hill on 01 March 2016;
- c) a review of the archaeological and cultural heritage assessments pertinent to the potential heritage values associated with the Project Area; and
- d) assessment of the potential for the Project Area to contain significant Aboriginal heritage and the impact on the Project may have on said heritage, consistent with the OEH *Due Diligence Code for the Protection of Aboriginal Objects in NSW* (2010).



The methods used for this assessment are in compliance with the OEH *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales 2010* and all relevant legislation as described in Section 2 of this Report.

### 1.3 Description of Proposal

The current proposal is to rezone the Project Area from RU2 (Rural Landscape) to R2 (Low Density Residential) for the purpose of developing the land into a residential subdivision. The average lot size will be approximately 600m<sup>2</sup>. The overall development will be centred around the Woolgoolga sports field development (Figure 2 and Figure 3). The Proposed Works also include connection of all utilities and construction of roads, paths and landscaping.

### 1.4 Report Authorship

The desktop study was undertaken by Senior Archaeologist Tim Hill, assisted by Archaeologist Pauline Fowler. The field inspection was conducted by Senior Archaeologist Tim Hill. This report was written by Tim Hill and Everick Director Tim Robins.







Figure 2: Proposed Lot Layout (Northern section)





Figure 3: Proposed Lot Layout (Southern Section).



## 2. LEGISLATIVE AND PLANNING CONTEXT

The following legislation provides the context for cultural heritage in NSW: the *National Parks and Wildlife Act 1974* (NSW) ('NPW Act'), the *Environmental Planning and Assessment Act 1979* (NSW) ('EP&A Act') and the *Heritage Act 1977* (NSW). The Commonwealth also has a role in the protection of nationally significant cultural heritage through the *Environmental Protection and Biodiversity Conservation Act 1999* (Cth), *The Protection of Movable Cultural Heritage Act 1986* (Cth) and the *Historic Shipwrecks Act 1976* (Cth).

For the purposes of this assessment it is the state and local legislation that is relevant. The consent authorities will be the CHCC and, where a referral agency is required to be reported to, the OEH. Approval from the OEH will be required should the Project propose to impact on identified Aboriginal Objects. The information below lists the legislative and policy framework within which this assessment is set.

### 2.1 The *National Parks and Wildlife Act 1974* (NSW) and the *National Parks and Wildlife Regulations 2009* (NSW)

The NPW Act is the primary legislation concerning the identification and protection of Aboriginal cultural heritage. It provides for the management of both Aboriginal Objects and Aboriginal Places. Under the NPW Act, an Aboriginal Object is any deposit, object or material evidence (not being a handicraft made for sale) relating to the Aboriginal habitation of the area, regardless of whether the evidence of habitation occurred before or after non-Aboriginal settlement of the land. This means that every Aboriginal Object, regardless of its size or seeming isolation from other Objects, is protected under the Act.

An Aboriginal Place is an area of particular significance to Aboriginal people which has been *declared* an Aboriginal Place by the Minister. The drafting of this legislation reflects the traditional focus on Objects, rather than on areas of significance such as story places and ceremonial grounds. However, a gradual shift in cultural heritage management practices is occurring towards recognising the value of identifying the significance of areas to Indigenous peoples beyond their physical attributes.

With the introduction of the *NPW Amendment Act 2010* (NSW) the former offence provisions under Section 86 of 'disturbing', 'moving', 'removing' or 'taking possession' of Aboriginal Objects or Places have been replaced by the new offence of 'harming or desecrating'. The definition of 'harm' is 'destroying, defacing or damaging an Object'. Importantly in the context of the management recommendations in this assessment, harm to an Object that is 'trivial or negligible' will not constitute an offence.



The new amendments also significantly strengthen the penalty provisions. The issue of intent to harm Aboriginal cultural heritage has been formally addresses by separating it from inadvertent harm. The penalty for individuals who inadvertently harm Aboriginal Objects is up to \$55,000, while for corporations it is \$220,000. Also introduced is the concept of *'circumstances of aggravation'* which allows for harsher penalties (up to \$110,000) for individuals who inadvertently harm Aboriginal heritage in the course of undertaking a commercial activity or have a record for committing similar offences. For those who knowingly harm Aboriginal cultural heritage, the penalty will rise substantially. The maximum penalty is set at \$275,000 or one year imprisonment for individuals, while for corporations it will rise to \$1,100,000.

Where a land user has or is likely to undertake activities that will harm Aboriginal Objects, the Director General (OEH) has a range of enforcement powers, including stop work orders, interim protection orders and remediation orders.

The NPW Act also includes a range of defence provisions for unintentionally harming Aboriginal Objects:

- a) Undertaking activities that are prescribed as 'Low Impact'.
- b) Acting in accordance with the new Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales (2010) ('Due Diligence Code');
- c) Using a consulting archaeologist who correctly applies the OEH Code of Practice for Archaeological Conduct in New South Wales (2010); and
- d) Acting in accordance with an Aboriginal Heritage Impact Permit (AHIP).

### 2.1.1 *'Low Impact Activities'*

The NPW Regulations allow for a range of low impact activities to be undertaken without the need to consult the OEH or a consulting archaeologist. Generally, those who undertake activities of this nature will not be committing an offence, even if they inadvertently harm Aboriginal objects. These activities include:

- a) maintenance such as on existing roads and tracks, or on existing utilities such as underground power cables and sewage lines;
- b) farming and land Management for land previously disturbed, activities such as cropping, grazing, bores, fencing and erosion control;
- c) removal of dead or dying vegetation (only if there is minimal ground disturbance);
- d) environmental rehabilitation such as weed removal, bush regeneration;
- e) development in accordance with a Development Certificate issued under the EPA Act 1979 (provided the land is previously disturbed);



- f) downhole logging, sampling and coring using hand held equipment; and
- g) geochemical surveying, seismic surveying, costeaming or drilling.\*

\*This defence is only available where the land has been disturbed by previous activity. Disturbance is defined as a clear and observable change to the land's surface, including but not limited to land disturbed by the following: soil ploughing; urban development; rural infrastructure (such as dams and fences); roads, trails and walking tracks, pipelines, transmission lines; and storm water drainage and other similar infrastructure.

## 2.2 Due Diligence Code of Practice for the Protection of Aboriginal Objects

The Due Diligence Code has been applied in Section 10 of this assessment. It operates by posing a series of questions for land users before they commence development. These questions are based around assessing previous ground disturbance. An activity will generally be unlikely to harm Aboriginal Objects where it:

- a) will cause no additional ground disturbance;
- b) is in a developed area; or
- c) is in a significantly disturbed area.

Where these criteria are not fulfilled, further assessment for Aboriginal cultural heritage will typically be required prior to commencing the activity.

## 2.3 The ACHCRP (2010)

The *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (2010) ('ACHCRP') provide an acceptable framework for conducting Aboriginal community consultation in preparation for impacts to Aboriginal cultural heritage. Proponents are required to follow them where a Project is likely to impact on cultural heritage and where required by Council.

It is recommended by the OEH that all cultural heritage assessments involve this level of consultation, although it is not strictly a requirement unless it meets the above criteria. The ACHCRP Guidelines typically take a minimum of 90 days to complete. However, in complicated Projects this period may need to be extended by several months. The Guidelines require public notice of the assessment, preparation of a proposed methodology, undertaking site meetings and excavations where required, the production of a draft report, which is distributed to the registered Aboriginal groups and the production of a final report.



Given the low archaeological potential of the current Project Area, it has been concluded that following the ACHCRP Guidelines is not warranted for this assessment.

## 2.4 The Coffs Harbour Local Environmental Plan 2013

The Coffs Harbour LEP 2013 provides statutory protection for items already listed as being of heritage significance (Schedule 5), items that fall under the ambit of the *Heritage Act 1977* (NSW) and Aboriginal Objects under the *National Parks and Wildlife Act 1974* (NSW). It aims to ensure best practice components of the heritage decision making process are followed.

For listed heritage items, or a building, work, relic or tree and heritage conservation areas, the following action can only be carried out with the consent of the Coffs Harbour City Council (CHCC):

- a) demolishing or moving a heritage item or a building, work, relic or tree within a heritage conservation area;
- b) altering a heritage item or a building, work, relic, tree or place within a heritage conservation area, including (in the case of a building) making changes to the detail, fabric, finish or appearance of its exterior;
- c) altering a heritage item that is a building by making structural changes to its interior;
- d) disturbing or excavating an archaeological site while knowing, or having reasonable cause to suspect that the disturbance or excavation will or is likely to result in a relic being discovered, exposed, moved, damaged or destroyed;
- e) disturbing or excavating a heritage conservation area that is a place of Aboriginal heritage significance;
- f) erecting a building on land on which a heritage item is located or that is within a heritage conservation area; and
- g) subdividing land on which a heritage item is located or that is within a heritage conservation area.

In addition, CHCC may not grant development consent without considering the effect the proposed development will have on the heritage significance of heritage item or heritage conservation area concerned.

Furthermore, in regards to Aboriginal heritage significance (Part 5.10.8) the consent authority must, before granting consent under this clause to the carrying out of development in a place of Aboriginal heritage significance:

- a) consider the effect of the proposed development on the heritage significance of the place and any Aboriginal object known or reasonably likely to be located at the place; and



- b) notify the local Aboriginal communities (in such way as it thinks appropriate) about the application and take into consideration any response received within 28 days after the notice is sent.

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### 3. ABORIGINAL COMMUNITY CONSULTATION

#### 3.1 Traditional Owner Knowledge

The Aboriginal Stakeholders are the primary determinants of the significance of their cultural heritage. Members of the Aboriginal community will be consulted, and will continue to be consulted, with regard to their concerns not only about known archaeological sites in the region, but also about cultural values such as areas with historic and spiritual significance, and other values relating to flora and fauna of the area. Everick recognises that there may be Traditional Owner knowledge associated with the region that will have to be treated in a confidential manner.

#### 3.2 The Consultation Process

Everick undertook a consultation process with the Aboriginal community in accordance with the *OEH Aboriginal Cultural Heritage Consultation Requirements for Proponents (2010)* (ACHCRP). A summary of the process undertaken is as follows:

- a) correspondence to the Office of Environment and Heritage (dated 6 October 2017);
- b) correspondence to The Registrar, *Aboriginal Land Rights Act 1983* for a list of Aboriginal Owners (dated 6 October 2017);
- c) correspondence to NTSCORP Limited (dated 6 October 2017); and
- d) correspondence to Coffs Harbour City Council (dated 6 October 2017).

Written correspondence was forwarded on 2 November 2017 to the following individuals and organisations providing an opportunity to be involved in the assessment project:

- Garby Elders,
- Coffs Harbour and District Local Aboriginal Land Council,
- Garlambirla Guuyu-girrwa Aboriginal Corporation,
- Mudjay Elders,
- Bagawa Birra Murri Aboriginal Corporation,
- Yarrawarra Aboriginal Corporation,
- Mimi Mothers Aboriginal Corporation,



- Muurrbay Aboriginal Language and Cultural Cooperative Ltd,
- Ciaron Dunn,
- Gumbayngirr Native Title Group,
- Gumbayngirr Elders,
- Ngurrala Aboriginal Corporation,
- Uncle Thomas Kelly and Family,
- Derrick Vale Sr.,
- Natalene Mercy,
- Jagun Elders; and
- Norm Archibold.

A public advertisement was placed in the Coffs Coast Advocate on 4 November 2017 (Figure 4) with a closing date of 12 April 2016.

**Aboriginal Cultural Heritage Study Registration of Interest**

Everick Heritage Consultants Pty Ltd (ABN 78 102 206 682) is seeking to consult with interested Aboriginal persons in preparation for the proposed rezoning project at Bark Hut Road, Woolgoolga, NSW. The Study Area consists of Lot 202 DP874273, Woolgoolga (west of Solitary Islands Way). Consultation will be undertaken in preparation for an Aboriginal Heritage Impact Permit application.

**What do you need to do?**  
Aboriginal persons who hold cultural knowledge of the region are invited to register their interest in writing with:

Everick Heritage Consultants  
PO Box 200  
COFFS HARBOUR NSW 2450  
or [l.hill@everick.com.au](mailto:l.hill@everick.com.au)

**When must registration be received?**  
Registration must be received by Monday 20 November 2017.

**Figure 4: Copy of advertisement placed in Coffs Coast Advocate 4 November 2017**

As a result of the consultation process the following list of Registered Aboriginal Parties (RAPs) was developed:

- Coffs Harbour and District Local Aboriginal Land Council; and
- Jagun Elders (via email see Appendix 3).





Everick Heritage Consultants believe that this Community Consultation process was adequate for the current project and as such has utilised this list as the basis for consultation for the current assessment.

A letter was forwarded to OEH and Coffs Harbour and District Local Aboriginal Land Council on 29 November 2017 notifying them of the outcomes of the consultation process (Appendix 4).

A consultation meeting was held with Mr Ian Brown and Ms Luana Ferguson (CHDLALC) and Uncle Tony Perkins (Jagun Elders) on 18 January 2018 to discuss the results of the initial inspection and provide advice and comment on the proposed management response for the project. An invitation to attend this meeting was provided to the Garby Elders however Uncle Milton Duroux and MR Tony Dootson were not able to attend the meeting. The notes from the meeting and email responses from RAPs are provide in Appendix D.

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## 4. ABORIGINAL CULTURAL HERITAGE DESKTOP REVIEW

### 4.1 The OEH Aboriginal Heritage Information Management System (AHIMS)

Care should be taken when using the AHIMS database to reach conclusions about site prevalence or distribution. For example, a lack of sites in a given area should not be seen as evidence that the area was not occupied by Aboriginal people. It may simply be an indication that it has not been surveyed for cultural heritage, or that the surveys were undertaken in areas of poor surface visibility. Further to this, care needs to be taken when looking at the classification of sites. For example, the decision to classify a site an artefact scatter containing shell rather than a midden can be a highly subjective exercise, the threshold for which may vary between archaeologists.

An extensive search was conducted on 12 January 2017 of the OEH AHIMS for the Project Area with a 50 metre buffer (ID 261963) which returned 2 Aboriginal site listings. Site features include artefacts and an Aboriginal Resource and Gathering site (See Table 1 and Figure 5). These sites are located within a proposed reserve area associated with Poundyard Creek and the Woolgoolga Sports Field development and will not be affected by the rezoning proposal.

**Table 1: AHIMS Search Results**

<i>Site Number</i>	<i>Name</i>	<i>Easting</i>	<i>Northing</i>	<i>Site 'Features'</i>
<b>22-1-0152</b>	C1_Poundyard Creek	517710	6669940	Artefact (1)
<b>22-1-0408</b>	West Woolgoolga Sports Field	517856	6669964	Artefact (2)



Figure 5: AHIMS extensive search results.



## 4.2 Other Heritage Registers

The following heritage registers were accessed on 27 September 2017:

- **The National Heritage List** (Australian Heritage Council): Contains no Aboriginal heritage listings within or within close proximity to the Project Area.
- **Commonwealth Heritage List** (Australian Heritage Council): Contains no Aboriginal heritage listings within or within close proximity to the Project Area.
- **Register of the National Estate** (Australian Heritage Council): Contains no Aboriginal heritage listings within or within close proximity to the Project Area.
- **The State Heritage Register** (NSW Heritage Office): Contains no Aboriginal heritage listings under Section 1 (Aboriginal Places listed under the NPW Act) within or within close proximity to the Project Area;
- **The Register of the National Trust of Australia:** Contains no listings within or within close proximity to the Project Area.
- **Coffs Harbour Local Environment Plan 2013 ('LEP'):** Contains no listings within or within close proximity to the Project Area.



## 5. LANDSCAPE CONTEXT

### 5.1 Environment Locality

#### 5.1.1 Topography

Topography can generally be described as gently slopes and ridges. Elevation of the site varies from approximately RL 9.5m AHD, to around RL 38.0 m AHD. Surface slope is relatively moderate, typically around 10%, with isolated areas getting as steep as 25% and as flat as 1%. The northern portion of the site is situated on the southern side of a ridge, and consequently, falls to the south-east, to a well defined gully running south to Poundyard Creek. The southern portion of the site is located on a knoll, and as such the land falls away from the top of the feature.



Figure 6: Lot Layout and contour map- Northern section.



Figure 7: Lot Layout and contour map- Southern section.

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## 6. ARCHAEOLOGICAL SYNTHESIS AND PREDICTIONS

### 6.1 European History of the Coffs Harbour Area.

The first historical documents relating to the Woolgoolga area are the naming of the 'Solitary Islands' by James Cook in May 1770, with additionally mapping by Matthew Flinders in 1779. However, despite the early records from 1791 of the convicts William and Mary Bryan and their two children running away to the area, it was not until 1847 that the next record of the settlement exists, with Captain John Korff taking shelter at the southern Headland of the area that is now 'Coffs Harbour' (Thomas 2013). European settlement of the Coffs Harbour/ Woolgoolga area was relatively late compared to areas along the Bellinger and Clarence Rivers. This was largely due to the absence of a large river system:

There was at least some cedar getting at Coffs Creek by Walter Harvie and George Tucker in 1865, with the camp set up by Harvie and Tucker being one of the earliest known semi-permanent settlements in the Coffs Harbour area. Timber getters often employed the services of Aboriginal bushmen who had the knowledge and skills to rapidly identify Cedar trees (Thomas 2013:2).

The township of 'Woogoolga' was first gazetted in 1888, (subsequently changed to Woolgoolga in 1966) following initial settlement in the 1870's. Three major phases of settlement can be defined within the Coffs Harbour area which have had cumulative impacts around Woolgoolga:

**Forestry and forest related industries:** This phase of settlement includes the very early extraction of cedar and later more broad extraction of remaining eucalypt species. This later process of clearing has historic linkages to the settlement of the area post World War 1 and the clearing of land by returned soldiers for early agriculture and horticulture. It is reasonable to assume that the Project Area was initially cleared for its timber resources.

**Horticulture and agriculture:** Farming has played an important role in the study area and has had the most significant impact on the physical landscape. Large areas of land have been cleared and regrowth managed for grazing and horticulture. Significant early crops include bananas, sugar cane and pineapples. Some agricultural diversification has taken place, and contemporary land use includes the cultivation of Blueberries and nuts (Macadamias particularly) and the establishment of aquaculture. A number of market gardens have operated within the area and are consistent with the historical process of dividing agricultural land into smaller lots as the district population increased. This type of land use has had the most significant historical effect on the Project Area.

**Residential development:** This process of urbanisation has increased significantly since the 1980's. This process is most noticeable with the development of residential areas around small coastal settlements such as Sandy



Beach and Safety Beach. This urbanisation has mostly been contained within areas already cleared as a result of forestry and horticulture, and has significantly changed water courses and drainage. No evidence of residential development was observed on the Project Area.

## 6.2 Aboriginal History

The study area is located within the Gumbayngirr Nation/Language Area which is broadly known to include the lands north of Nambucca Heads, south of the Clarence River and west up to the Great Dividing Range (Thomas 2013:1). The name Woolgoolga is understood to be derived from the word Wee- gullga or Weilgulga for a native plum or lilly pilly which was known to occur abundantly between the beach and lake ([http://www.gnb.nsw.gov.au/place\\_naming/placename\\_search/extract?id=SXlpMKmMn](http://www.gnb.nsw.gov.au/place_naming/placename_search/extract?id=SXlpMKmMn)). This reference supports the use of the area for exploitation of closed and rainforest resources.

Given the problematic nature of pre-European Aboriginal population estimates, the latter and more 'general' observations of Mathews (1898) for the broader Northern NSW coastline are more relevant:

In the well-watered coastal districts of New South Wales, where fish and game are abundant, their hunting grounds would be comparatively small (Mathews 1898:66).

Radcliffe Brown (in Lane 1970:V.8) concludes for the coastal areas that population densities would be in the order of 'one person to every three square miles'. Estimates of tribal groups in the order of 200 individuals are relatively common amongst ethno-historic and anthropological literature (i.e. see Lane (1970) for the Nambucca River district immediately south). An additional element to this discussion of population density is the differentiation between the coastal and the escarpment areas where it is generally accepted had lower and much more mobile Aboriginal populations. For the larger River systems (Nambucca, Clarence and Macleay) the concept of more intensive use of the coast as compared to the up-river and escarpment is generally accepted (i.e. McBryde 1974, Godwin 1990).

However, a unique aspect of the Coffs Harbour/ Woolgoolga area is the close proximity of the Great Dividing Range to the Coastline and the absence of a major river system. No other 'district' on the North Coast has such a narrow coastal zone, or such a short distance between the very different environments of coast and elevated/cold forests, and so many small creek or estuary systems which run directly into the Pacific Ocean. There is however great potential for pathways and routes between the coast and escarpment/hinterland however, these are not necessarily represented archaeologically through the discard of Aboriginal Objects or noted in early ethno-historical accounts.





Due largely to the absence of a large river system the Coffs Harbour district was settled by Europeans later than areas of the Clarence River to the north or Bellingen/ Kalang and Nambucca Rivers to the South. As such any observations from the relatively late settlement of the Woolgoolga area would also be biased as Gumbayngirr people generally would have had some 25 years of contact with European settlers by the time detailed records of Aboriginal life in the area were produced. It is expected that most of the local populations would have moved northward to Grafton around the time of settlement of Woolgoolga.

The relatively limited amount of ethno historical information available for Coffs Harbour has been collated for the Coffs Harbour by-pass project which is focussed on the edge of the Coffs Harbour escarpment and therefore an analogous environment to the Study Area (Connell Wagner 2004). The study suggests that a mode of occupation focussed around 'base camps' which provided a degree of protection from the elements surrounded by a series of smaller 'resource-specific' sites in between. The study places populations (in terms of size of group per camp) at 50 with groups as large as 200 recorded at Sawtell/ Bonville Creek. The study (Connell Wagner 2004:6) also makes specific reference to the sub-coastal area- indicating that permanent occupation of these areas was rare- with use being typically during travel to another location.

Historic camps in the Coffs Harbour area tended to be on Public land and nearby to small townships where there was access to water either naturally occurring or at a public tap. The main camping areas identified by Goulding (2001:64,65) are at Corindi Lake, inland from Arrawarra, Nana Glen (junction of Orara River and Bucca Bucca Creek), Happy Valley in Coffs Harbour, Coffs Creek/Fitzroy Oval, Wongala Estate and Yellow Rock. Generally speaking the historical experiences of Aboriginal people has been one of exclusion up until the 1960's (i.e Calley 1956:201). The nature of historic Aboriginal camps and economy within the historic period is such that it is unlikely these types of 'sites' will be present in the historic record of the study area.

## 6.3 Archaeological and Cultural Heritage Assessments

### 6.3.1 *Hearnes Lake.*

Hearnes Lake is a small creek and estuary system located immediately south of Woolgoolga Creek and provides a useful analogy for the Project Area. An archaeological assessment of the Hearnes Lake Caravan Park was undertaken in 1983 (Lilley 1983). No sites were recorded during the survey in the caravan park however, an isolated artefact and midden scatter was recorded immediately north of Hearnes Lake Road. The middens were described as 'dinner time camps' and contained Triton Spp. which are associated with rocky coastlines.

Dallas (2008) undertook an archaeological assessment for a proposed residential development to the south of Hearnes Lake which identified a number of sites directly associated to Hearnes Lake and Double Crossing Creek. Site types included artefact scatters and isolated artefacts. These artefacts were typically derived from locally



available cobbles or pebbles and included several manuports. The sites were located on the alluvial plain in close proximity to estuarine and swamp environments

An archaeological survey was undertaken for the Development Control Plan for Hearnese Lake residential area immediately south of the Woolgoolga industrial area (Collins 2004). This study identified a number of Aboriginal sites and PADs including site HL-1 (22-1-0234) which is described as an Artefact Scatter consisting of flakes and cores produced from locally available Greywackes as well as introduced Cherts and indurated Mudstones. A total of 13 stone artefacts were recorded (Collins 2004:20). The DCP survey also identified 19 stone artefacts within Lot 21 DP 714858 (#22-1-0359-Hearnese RD Lot 21 Ridge Site) which is immediately adjacent to the coastline/ Hearnese Lake entrance.

Two archaeological assessments were undertaken for the 'Woopi Beach Estate' residential development which comprised the area of the Hearnese Lake 1 site (Hill et al 2015a, 2015b). These studies confirmed the extent of the Hearnese Lake 1 site as being the ridge crest as originally mapped by Collins (2004). Artefacts identified at Hearnese Lake 1 included a large number of small flakes produced from mudstones and siltstones; quartz and silcrete however the assemblage predominately comprised simple greywacke flakes, cores and flake pieces. A double edge ground greywacke axe and an isolate flake to the east of the study area (Hearnese Lake 5) were also identified by this study (Hill 2015a). A major finding of the study was the presence of artefacts in areas which had been cleared and grazed and the absence of artefacts in areas which had been excavated.

### 6.3.2 *Coffs Harbour- Urunga Forestry Management Areas (Davies and Stewart Zerba 1995).*

The Coffs Harbour- Urunga Forestry Management study provides the most comprehensive regional assessment of the archaeological values and potential of the Coffs Coast hinterland. Whilst it is acknowledged that the sub-coastal zone which comprises the Project Area is not included within the Davies study some of its findings have practical application as the study was structured around 'landsystems' (Davies and Stewart Zerba 2005). Overall the sampling strategy employed by the study was biased towards the location of open campsites, stone artefact scatters and isolated finds. However the study found a strong correlation between archaeological sites; the degree of slope and the sandiness of soils and concluded that the majority of archaeological sites occurred on the crests of spurs in areas which would have been dry sclerophyll or open forest. Regionally the majority of archaeological sites in the study area were associated with the dissected escarpment and ranges with relatively few sites found on near coastal low hills and rises. However, the study found that whilst 'site density' was greater in the escarpment area the number of artefacts per site was much lower when compared to coastal and sub-coastal sites. This finding supports a model of greater mobility through the escarpment and a relative absence of permanent camps when compared resource rich marine and estuarine areas of the coastline.



### 6.3.3 *Sapphire to Woolgoolga Pacific Highway Upgrade (Collins 2007)*

The upgrade of the Pacific Highway between Sapphire and Woolgoolga resulted in the construction of a new highway bypass less than 1km west of the Project Area. The archaeological assessment for this major project was undertaken by Collins (2007) and identified a total of 7 archaeological sites and 8 PADs. Three of these sites (S2W-5, S2W-6 and S2W-7) are in close proximity to the Project Area (refer section 5.1 above) and are located on a single south facing ridge-crest which forms part of the Woolgoolga Creek catchment area. Two PADs (PAD 2 and 3) were also recorded during this study.

Two of the sites (S2W 5 and S2W-6) were recorded as isolated artefacts whilst the S2W-7 site was recorded as a much larger stone artefact scatter with at least 200 artefacts. The artefact assemblage in S2W-7 is diverse and includes (as examples) simple greywacke flakes, retouched mudstone flakes; chert flakes, chert cores and a grindstone. As such it is reasonable to conclude that the ridge crest was used as a campsite and knapping area. The average density of S2W-7 was estimated to be 2.2 artefact per m<sup>2</sup> (Collins 2007:40-44).

### 6.3.4 *Woolgoolga Modular Housing Estate (Hill et al 2016)*

Everick Heritage Consultants undertook an Aboriginal Cultural Heritage Assessment of the Woolgoolga Modular Housing Estate ('MHE') located on McIntosh Crescent, to the south of Newmans Road, Woolgoolga. This survey resulted in the identification of 2 artefacts on a small tributary to Woolgoolga Creek and a redeposited hammer stone in a pile of introduced fill. The study concluded that the area was not utilised as a main campsite or stone tool production area. The study proposed that the main campsites, and therefore areas of high archaeological potential, are located along the Woolgoolga Estuary closer to the coast and on the surrounding ridge crests to the north of the Project Area. Consultation with Coffs Harbour and District Local Aboriginal Land Council indicated that the study area may have been a 'pathway' between Woogoolga Creek Estuary and the Coast Range, including 'Marys Waterhole' or have functioned as a peripheral area to the Woolgoolga fighting ground located to the east (near the Fire station).

## 6.4 Potential Site Types: Aboriginal Archaeological Sites in the Coffs Harbour Region

The most comprehensive 'regional' model for the area is provided by Godwin (1990) in a major review of the earlier archaeological research of Isabelle McBryde. Godwin's model specifically investigates patterns of movement between the coastal, sub-coastal and tablelands (escarpment) areas. However the applicability of this model to the Coffs Harbour area is problematic as the tablelands/escarpment intrude so far into the coastal zone.



For the purposes of understanding the archaeological record the study area is considered to fall into the 'coastal' area.

Amongst coastal groups proper there was no movement from the coast back into the sub-coastal river valleys and foothills. These people were semi-sedentary and lived close to the coast the whole year round. Movement associated with the subsistence round involved travelling only short distances away from the littoral. There were instances of long distance travel associated with ceremonial gatherings. However, such movement was generally parallel to the coast (i.e. north-south along the coast rather than east-west from coast to hinterland) (Godwin 1990:122,123).

Collins (2007:27-28) study of the Sapphire to Woolgoolga Highway upgrade proposed a model of archaeological sensitivity based on landform. This study identifies three broad land systems- being Coastal Alluvial Plains; Coastal Ramp and Escarpment Foothills. The Project Area is considered to fall within the Coastal Alluvial Plain of which the study (Collins 2007) proposes;

...those with highest archaeological sensitivity are well-drained swamp and estuary banks, and the level to low - gradient crests of low rises and spurs.

Elements of lowest archaeological sensitivity are valley flats, plains and open depressions. Irrespective of their landscape context, areas developed for residential uses or otherwise intensively disturbed (e.g. road and services easements) will also have low archaeological sensitivity. (Collins 2007:27)

For the purposes of this model the Project Area is considered to be a valley flat or plain on the grounds that the adjacent creek is not estuarine and there is no noticeable gradient typical of crests of spurs which occur further to the west and north.

Based on the review of previous archaeological and cultural heritage assessments in Woolgoolga and the broader region it is reasonable to propose that specific environment contexts including lowland hills, estuarine creek banks and coastal dunes are more likely to contain evidence of Aboriginal occupation. The review of previous studies indicates that archaeological sites are rarely found on alluvial flats not associated to estuarine environments. However, the following site types and potential types have been identified in the above contexts.

#### *6.4.1 Isolated Artefacts*

These sites consist of single stone artefacts, which may have been randomly discarded or lost. They can occur in almost any environmental context exploited by Aboriginal people. They are commonly stone axes, single cores, hammer stones, pebbles, flakes and grinding stones and/or grooves. Their presence may indicate that more



extensive scatters of stone artefacts exist or existed nearby, perhaps obscured by vegetation or dispersed by mechanical means.

There is a low potential for isolated artefacts to be located within the Project Area. Should these occur they are likely related to peripheral use of larger campsites along ridge crests to the west and the Woolgoolga Creek estuary to the south.

#### 6.4.2 *Open Campsites/Artefact Scatters*

Open campsites/artefact scatters generally consist of scatters of stone artefacts and possibly bone and hearth features. Their exposure to the elements means that evidence of food resources used on the site (with the exception of shellfish) is usually lacking. An open campsite containing a large component of shell refuse may be described as a midden. They invariably consist of low or high density scatters of primary and secondary flakes in addition to the types of artefacts found as isolated finds. Open campsites may also contain burials when located on sand strata. Few open campsites are found on kraznozem and podzolic soils, possibly due to the destructive impacts of land clearing and the heavy vegetation cover. Detection is usually unlikely unless a high degrees of surface visibility is present.

There is a low potential for artefacts scatters to be located within the Project Area. It is likely that larger open campsites will be located on ridgecrests to the west of the Project Area and to the east along the Woolgoolga Creek estuary.

#### 6.4.3 *Quarry Sites*

A stone quarry may occur where a source of opaline silica exists or other siliceous types of stone occur (e.g. chert, chalcedony and silcrete). The area can be identified by a number of different types of stone tools in various stages of production as well as refuse flakes.

Given that lack of visible suitable bedded rock outcrops or known sources of siliceous material, it is reasonable to expect that no quarry sites will be located within the Project Area.

#### 6.4.4 *Scarred Trees*

Scarred trees result from the removal of bark for use as covering, shields, containers or canoes. No doubt, as an outcome of widespread intensive land clearing and natural causes very few have survived.

As the Project Area has been completely cleared of trees, it is reasonable to assume that no scarred trees will be located. Scarred trees may exist within the riparian zone however would not be affected by the rezoning proposal.



#### 6.4.5 *Burials*

Human burials are typically individual or small group internments which can be found in sandy soil substrates, such as creek lines or within small rock crevices. Most of the known burials have been located by accidental means through mechanical disturbance or natural erosion.

Given that the underlying soil is not sandy, there is a low potential to locate burials within the Project Area.

#### 6.4.6 *Ceremonial Sites*

Ceremonial grounds are typically places identified by Aboriginal groups as places of importance which were visited by groups to mark or commemorate rites or other occasions. One such example is Bora grounds; earthen mounds crafted in a circular formation which were used for the purposes of ceremonial practices.

No ceremonial sites are known to occur on within the Project Area.

#### 6.4.7 *Mythological Sites*

These sites are natural features, which derive their significance from an association with stories of the creation and mythological heroes.

No mythological sites are known to occur within the Project Area.



## 7. FIELD SURVEY: ABORIGINAL CULTURAL HERITAGE

### 7.1 Survey Team

A pedestrian survey for cultural heritage of the Project Area was undertaken by Everick Senior Archaeologist Tim Hill and CHDLALC Senior Aboriginal Sites Officer Ian Brown on 20 September 2017.

### 7.2 Assessment Methods

The field methods aimed to inspect exposed ground surfaces as conditions would allow, to record any archaeological material found and undertake a preliminary assessment of its significance. The potential of the Development Area to contain sub-surface deposits (PADs) was also assessed through observation of soil profiles along Woolgoolga Creek and in any disturbed areas.

Photographs were taken as a record of general features and to document past disturbance. Notes were made of the degree of disturbance and the archaeological potential. A Garmin GPS (GDA 94 datum) was used to record the extent of survey coverage. Mapping and plans used in this assessment were provided by Connectability Pty Ltd and represent the level of information provided to the consultant.

In addition to assessing the cultural heritage potential of the Project Area, the survey aimed to confirm the interpretation of the nature and degree of ground disturbance observed in and satellite imagery (Figure 2 and Figure 3).

For ease of ground coverage and for purposes of description the Project Area is treated as a single unit due to the uniformity of conditions. There are no mature trees within the Development Area and as such these were not directly targeted by the survey.

### 7.3 Constraints to Site Detection

An assessment of the constraints to site detection is made to assist in formulating a view as to the effectiveness of the field inspection to find Aboriginal sites and cultural heritage materials. It also assists in the forming of a view of the likelihood of concealed sites (PADs), keeping in mind a site specific knowledge of the disturbance impacts that European land uses and natural processes may have had on the 'survivability' of Aboriginal sites in a Development Area.



The constraints to site detection are almost always most influenced by post European settlement land uses and seldom by natural erosion processes. The area of surface exposure and the degree of surface visibility within exposed surfaces are usually the product of 'recent' land uses e.g. land clearing, ploughing, road construction, natural erosion and accelerated (manmade) erosion (McDonald et .al. 1990:92).

In this case the major 'manmade' constraints to Aboriginal site survivability and detection are due to the clearing of original forest and the subsequent impacts of grazing which through, what is called taphonomic processes, can have the effect of accelerating movement of artefacts such as stone downward through soft soils. Detection of Aboriginal archaeological sites in the Project Area is severely limited by the presence of improved pastures. Vegetation has been cleared in the past. Some evidence of mass movement and erosion of soils was noted throughout the Project Area in the form of a large swale which has likely been constructed from material excavated from the Sports Field. Based on the observations taken during the survey it reasonable to conclude that it is unlikely that any soils in the upper 300mm contain original surfaces (Figure 8, Figure 9 and Figure 10).

**Table 2: Summary of Environment and Ground Disturbance for Survey Unit.**

<i>Survey Unit</i>	<i>Environmental Description</i>	<i>Ground Disturbance Summary</i>
Ridge crests	Open pastured grassland with some sparse native and introduced (pine) trees. Vehicle tracks occur along the spine of most ridge crests.	Land clearing.
Slopes	Open pastured grassland with some sparse native and introduced (pine) trees.	Land clearing.

## 7.4 Survey Coverage

To achieve as thorough and effective an archaeological assessment as possible a pedestrian ground survey of a sample of the Project Area was undertaken. The following summarises the broad conditions for the survey of each identified unit within the Project Area:

- a) Ridge crests. Cleared open grassland with some regrowth of native trees and introduced pines. The understory was typically dense comprising bladey grass and weeds.
- b) Slopes. Cleared grassland with large patches of regrowth forest including native trees and introduced pines. The understory was typically dense comprising bladey grass and weeds.

Table 3 and Table 4 present information on the extent to which survey data provides sufficient evidence for an evaluation of the distribution of archaeological materials across the Project Area. The evaluation of survey





coverage provides a measure of the potential for the survey to identify archaeological evidence. The calculations in Table 4 and Table 3 do not provide an exact percentages, but reasonable estimates.

**Table 3: Survey Coverage.**

Survey Unit	Landform	Survey Area (m <sup>2</sup> )	Visibility (%)	Exposure (%)	Effective Coverage Area (m <sup>2</sup> )	Effective Coverage (%)	Sites Found
PAD 1 (North ridge)	Ridgecrest	200	20	30	12	6	2
PAD 2 (Middle Ridge)	Ridgecrest	375	20	30	22.5	6	0
PAD 3 (South Ridge)	Ridgecrest	150	5	5	.375	0.25	0

**Table 4: Landform summary- sampled areas**

Landform	Landform Area (m <sup>2</sup> )	Area Effectively surveyed (m <sup>2</sup> )	% of Landform effectively surveyed	Number of sites	Number of artefacts
PAD 1 (North ridge)	4119	12	0.29	2	2
PAD 2 (Middle Ridge)	5028	22.5	0.44	0	0
PAD 3 (South Ridge)	9742	.375	0.0038	0	0

The following should be considered when reviewing the effectiveness of the survey and the survey results:

- a) The target total survey area for pedestrian transects was 5% of the Project Area which was not achieved by the survey primarily due to the significant amount of improved pasture and weeds over the Project Area at the time of the survey.
- b) The overall low predicted likelihood of identifying sites within the Project Area.
- c) The potential that stone artefacts have moved downward through the soil profile as a result of clearing, trampling and topsoil disturbance.



**Figure 8: Typical surface exposure along trail on ridge crest with regrowth trees on slope.**



**Figure 9: Trail along ridge with cleared crest and slopes.**



**Figure 10: Typical exposure on trail from western portion of Project Area.**

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## 8. RESULTS

### 8.1 Results

As a result of the desktop study, field inspections, Aboriginal community consultation and archaeological investigation of the Project Area, the following was found.

- Two artefacts (Bark Hut Road IF 01 #22-1-0503 and Bark Hut Road IF 02 #22-1-0504) were observed on the access trail immediately south of the Bark Hut Road entrance to the Project Area (Figure 12). These consisted of stone flakes derived from Greywacke and Rhyolite, which are common in the Woolgoolga area. Given the location of the artefacts on an area of upper slope, it is likely that the artefacts are a secondary deposit from the main campsite, which is identified in the Council Reserve to the immediate west of the access road. This area will not be part of the rezoning application and as such this ridge crest was not surveyed.
- Having consideration for the landscape context of the Project Area and the history of disturbance it is considered unlikely that the Project Area will contain Aboriginal sites of high or moderate conservation value. The Project Area is unlikely to contain burials or middens and does not contain scarred or modified trees. Whilst some historic campsites are known in the general vicinity the Project Area none are known with the Project Area. No Mythological or ceremonial sites are known to occur within the Project Area, however it is noted that the ridge-crest may have been utilised as a pathway between the coast and hinterland.
- There is very little topsoil material in the upper slope and the artefacts were identified on the compacted surface of the trail. It is considered unlikely that the surrounding soils would contain Aboriginal objects. However, having consideration for the Due Diligence Code of Practice requirements the entire ridge crest is considered to a Potential Archaeological Deposit (PAD). This includes a small ridge crest in the north-east corner of the Project Area.
- A second PAD was identified in the southern portion of the Project Area comprising a knoll to the west of the water storage dam however no Aboriginal objects were identified on the knoll. However, the presence of topsoil on the knoll provides an indication that there is the potential for an Aboriginal stone artefact scatter to occur on the knoll.



**Table 5: Summary of survey results**

<i>Site Name</i>	<i>Feature</i>	<i>Easting (GDA94)</i>	<i>Northing (GDA 94)</i>	<i>Survey Unit</i>	<i>Landform</i>
<i>Bark Hut Road IF 01 (#22-1-0503)</i>	Stone artefact	517672	6670314	2	Upper Slope.
<i>Bark Hut Road IF 02 (#22-1-0504)</i>	Stone artefact	517742	6670394	2	Upper Slope.

No items or relics of European heritage were identified during the assessment.

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Figure 11: Bark Hut Road Isolated Find locations



**Figure 12: Site and PAD locations northern section.**



**Figure 13: PAD location southern section.**





**Figure 14: Location of Bark Hut Road Isolated Find 01 on access trail.**



**Figure 15: Detail of Bark Hut Road Isolated Find 1.**



**Figure 16: Location of Bark Hut Road Isolated Find 02 on access trail.**



**Figure 17: Detail Bark Hut Road Isolated Find 2 core.**



## 8.2 Significance Assessment

The artefacts identified by the study are determined to have low scientific value. The basis for this assessment is primarily the low degree of confidence that the artefacts are insitu, and that the artefacts are similar to stone artefacts from other assemblages in the Woolgoolga area. It is likely that the artefacts have been moved down slope from the adjacent ridge crest.

Based consultation with Aboriginal Sites Officers present during the assessment the Bark Hut Road sites are considered to be of social or cultural significance.

The aesthetic significance of the sites is considered to be low given the extent of surrounding land clearing.

## 8.3 Impact Assessment

The following table is provided to summarise the impacts that might arise from the Project (Table 6).

**Table 6: Bark Hut Road impact assessment summary.**

<i>Site Name</i>	<i>Type of Harm</i>	<i>Degree of Harm</i>	<i>Consequence of Harm</i>
<b><i>Bark Hut Road IF 01</i></b>	Direct	Total	Total loss of value
<b><i>Bark Hut Road IF 02</i></b>	Direct	Total	Total loss of value

## 8.4 Management and Mitigation Measures

The following management and mitigation options have been considered for the Bark Hut Road IF 01 and Bark Hut Road IF 02 sites:

- a) complete avoidance;
- b) harm with salvage and repatriation on-site; and
- c) harm without salvage.

It is concluded that 'harm with salvage and repatriation onsite' is the most appropriate management response for Bark Hut Road IF 01 and Bark Hut Road IF 02 sites.

The options for the salvage any Aboriginal objects which may occur within the Project Area include;



- retrieval of artefacts via a mechanical sieving program and reburial within the Project Area;
- relocation of the topsoil into designated reserve/ landscape areas; and
- relocation of topsoil to an appropriate location away from the Project Area.

## 8.5 Ecologically Sustainable Design Principles

It is reasonable to conclude that the Development Area has a low potential to contain Aboriginal objects and that the Bark Hut Road Isolated Finds 01 and 02 are disturbed. It is likely that the main areas of occupation, and therefore potential to contain Aboriginal objects, are located on the ridge crest to the west of Bark Hut Road IF 02.

The Bark Hut Road Isolated Finds 01 and 02 sites will not significantly add to the current knowledge of coastal archaeology due to the nature of disturbance across the site and overall low artefact densities. Further the artefacts are not considered sufficiently unique to add to collections of artefacts held by the CHDLALC for future educational use or display.

The potential cumulative impact of the harm has been assessed as low on the basis that the Bark Hut Road Isolated Finds 01 and 02 sites have already disturbed.

## 8.6 Additional Research

It is not considered that additional archaeological research, in the form of test pit excavations, will significantly inform the management response for sites within the Project Area. This conclusion is based on the following considerations;

- the absence of large scale stone artefact scatters identified during the archaeological survey;
- the absence of known ceremonial or intangible sites in the Project Area and surrounds;
- the nature and extent of known archaeological sites in the surrounding areas; and
- The absence of deep and undisturbed topsoil deposits.

It is considered unlikely that an archaeological excavation program over the PAD areas will identify a stone artefact scatter with either high or moderate conservation value. Stone artefact scatters, should they occur, are likely to be disturbed, have low artefact densities and are unlikely to contain locally unique artefacts. As such it is reasonable to conclude that these sites, should they exist, will be of low



conservation value. As with the known Isolated Finds, salvage with repatriation on site is considered to be an appropriate management response for archaeological sites on PAD areas.



## 9. CONCLUSIONS AND RECOMMENDATIONS

On the basis of the results and discussed above, the following management recommendations are provided:

### Recommendation 1: Cultural Heritage Induction

It is recommended that a cultural heritage induction is provided by representatives of the RAPs for all senior civil works staff involved in the initial removal of topsoil from the ridge crests identified by the ACHAR. This induction should provide;

- an overview of the nature and extent of archaeological materials within the Project Area;
- the broader cultural context of the site and its significance to Aboriginal people;
- an outline of relevant legislation; and
- an outline of the AHIP salvage procedure and an outline of an appropriate Finds Procedure.

### Recommendation 2: Application for an Aboriginal Heritage Impact Permit (AHIP)

It is recommended that prior to commencement of works (issue of Construction Certificate) that the proponent apply for an Aboriginal Heritage Impact Permit (AHIP) for salvage of known Aboriginal Objects from within the Project Area (Bark Hut Road IF 01 #22-1-0503 and Bark Hut Road IF 02 #22-1-0504). This AHIP should be subject to the following conditions relating to the salvage program:

- Cultural heritage induction for all ground clearance contractors.
- Collection of surface artefacts by Raps and temporary storage at CHDLALC.
- Monitoring of topsoil removal and collection of artefacts from the ridge crest and temporary storage at CHDLALC.
- The monitoring should be in an area 20m below the access track and along the apex of the ridge to the upper/ mid slope. All the way down to Creek.
- Permanent burial of artefacts within a reserve or garden area nearby.
- The monitoring should also include the ridge area in the north-east of the Lot.

### Recommendation 3: Southern PAD

It is noted that the site inspection did not identify any Aboriginal objects within the southern PAD area, defined by the knoll to the west of the water storage dam. Having consideration for the potential of this PAD to contain Aboriginal sites of high or moderate conservation value it is recommended that the minimum management response for this PAD is a cultural heritage induction and the application of an Aboriginal Find Procedure.



If it is suspected that Aboriginal material has been uncovered as a result of development activities within the Project Area:

- a) work in the surrounding area is to stop immediately;
- b) a temporary fence is to be erected around the site, with a buffer zone of at least 10 metres around the known edge of the site;
- c) an appropriately qualified archaeological consultant is to be engaged to identify the material; and
- d) if the material is found to be of Aboriginal origin, the Aboriginal community is to be consulted in a manner as outlined in the *ACHCRP Guidelines (2010)*.

Should the material be identified as an Aboriginal object and the proposed works cannot be amended to avoid the Aboriginal site an Aboriginal Heritage Impact Permit (AHIP) would be required prior to recommencement of works in the vicinity of the site. Consultation with stakeholders from the Aboriginal community would be required as a part of the AHIP application process.

It is recommended that these requirements are formalised within a Cultural Heritage Management Plan agreed to by Registered Aboriginal Parties prior to issue for the Development Application for subdivision to allow an opportunity for RAPs to better consider the full impacts of proposed works.

#### Recommendation 4: Aboriginal Human Remains

Although it is unlikely that Human Remains will be located at any stage during earthworks within the Project Area, should this event arise it is recommended that all works must halt in the immediate area to prevent any further impacts to the remains. The Site should be cordoned off and the remains themselves should be left untouched. The nearest police station (Coffs Harbour), the Coffs Harbour Local Aboriginal Land Council and the OEH Regional Office (Coffs Harbour) are all to be notified as soon as possible. If the remains are found to be of Aboriginal origin and the police do not wish to investigate the Site for criminal activities, the Aboriginal community and the OEH should be consulted as to how the remains should be dealt with. Work may only resume after agreement is reached between all notified parties, provided it is in accordance with all parties' statutory obligations.

It is also recommended that in all dealings with Aboriginal human remains, the Proponent should use respectful language, bearing in mind that they are the remains of Aboriginal people rather than scientific specimens.



## Recommendation 5: Conservation Principles

It is recommended that all effort must be taken to avoid any impacts on Aboriginal Cultural Heritage values at all stages during the development works. If impacts are unavoidable, mitigation measures should be negotiated between the Proponent, OEH and the Aboriginal community.





## 10. REFERENCES

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## APPENDIX A: AHIMS SEARCH RESULTS

Office of Environment & Heritage		AHIMS Web Services (AWS)								Your AHIMS Number - Bark Hut Road	
		Extensive search - Site list report								Client Service ID - 35294	
ID#	Site Name	Status	Area	Location	Acres	Category	Site Status	Site Name	Classification	Site Type	Priority
22-1-0001	11, Rowland St	Active	NSW	61 127130	660000	Open site	Active	NSW	Aboriginal Remains and Cultural Heritage (Archaeology)	NSW	High
22-1-0002	Woolgoolga State Park	Active	NSW	61 127130	660000	Open site	Active	NSW	Aboriginal Remains and Cultural Heritage (Archaeology)	NSW	High

Report generated by AHIMS Web Services on 12/02/2017 for Bark Hut Road for the following area: Lot 101, DP28074171 with a buffer of 10 meters. Additional info: Long Street, Rowland St, Woolgoolga State Park, Woolgoolga State Park (NSW)

This information is generated by the AHIMS system. Office of Environment & Heritage (OEH) will not be responsible for any errors or omissions made in the information and consequences thereof and is advised.

Page 1 of 1



## APPENDIX B: CORRESPONDENCE TO POTENTIAL ABORIGINAL STAKEHOLDERS

02 November 2017

Our Ref: EV.600

Garby Elders  
Deborah Dootson  
21 Knox Street  
WOOLGOOLGA NSW 2456

Dear Deborah,

**RE: ABORIGINAL CULTURAL HERITAGE ASSESSMENT/ABORIGINAL HERITAGE IMPACT PERMIT  
LOT 202 DP874273, WOOLGOOLGA, NSW**

We wish to advise that we have been engaged to undertake an Aboriginal Cultural Heritage Assessment for the above mentioned study area. The land subject to assessment is situated at Bark Hut Road, Woolgoolga, NSW. The assessment will be conducted for the proposed rezoning of Lot 202 DP874273, Woolgoolga, NSW, (west of Solitary Islands Way)(see enclosed plan).

We are seeking to consult with all Aboriginal persons and organisations that may have knowledge about the history of the Project Area. Consultation will be consistent with the *Office of Environmental Heritage Aboriginal Cultural Heritage Consultation Requirements for Proponents (2010)*. If you are interested, or know of persons who may be interested, we request that you contact us by **20 November 2017** to register your interest. Please write to:

Tim Hill  
Senior Archaeologist  
Everick Heritage Consultants  
PO Box 200  
Coffs Harbour NSW 2450 /or  
t.hill@everick.com.au

If you have any questions about the Project, please contact Tim Hill on 0422 309 822. If you wish to find out more about our qualifications and experience in this field, please visit our website [www.everick.com.au](http://www.everick.com.au). We look forward to hearing from you.

Yours faithfully,

Tim Robins  
Director/Archaeologist  
Everick Heritage Consultants



02 November 2017

Our Ref: EV.600

Coffs Harbour and District Local Aboriginal Land Council  
Greg Douglas  
PO Box 6150  
COFFS HARBOUR NSW 2450

Dear Greg,

**RE: ABORIGINAL CULTURAL HERITAGE ASSESSMENT/ABORIGINAL HERITAGE IMPACT PERMIT  
LOT 202 DP874273, WOOLGOOLGA, NSW**

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Yours faithfully,

Tim Robins  
Director/Archaeologist  
Everick Heritage Consultants



02 November 2017

Our Ref: EV.600

Garlambirla Guuyu-girrwa Aboriginal Corporation  
The Chairperson  
PO Box 6904  
PARK BEACH NSW 2450

To the nominated Chairperson,

**RE: ABORIGINAL CULTURAL HERITAGE ASSESSMENT/ABORIGINAL HERITAGE IMPACT PERMIT  
LOT 202 DP874273, WOOLGOOLGA, NSW**

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Yours faithfully,

Tim Robins  
Director/Archaeologist  
Everick Heritage Consultants



02 November 2017

Our Ref: EV.600

Mudjay Elders  
Cultural Heritage Officer  
11 Anderton Street  
COFFS HARBOUR NSW 2450

To the nominated Cultural Heritage Officer,

**RE: ABORIGINAL CULTURAL HERITAGE ASSESSMENT/ABORIGINAL HERITAGE IMPACT PERMIT  
LOT 202 DP874273, WOOLGOOLGA, NSW**

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Yours faithfully,

Tim Robins  
Director/Archaeologist  
Everick Heritage Consultants



02 November 2017

Our Ref: EV.600

Bagawa Birra Murri Aboriginal Corporation  
Susan Hoskins  
31 Soren Larson Crescent  
BOAMBEE EAST NSW 2452

Dear Susan,

**RE: ABORIGINAL CULTURAL HERITAGE ASSESSMENT/ABORIGINAL HERITAGE IMPACT PERMIT  
LOT 202 DP874273, WOOLGOOLGA, NSW**

We wish to advise that we have been engaged to undertake an Aboriginal Cultural Heritage Assessment for the above mentioned study area. The land subject to assessment is situated at Bark Hut Road, Woolgoolga, NSW. The assessment will be conducted for the proposed rezoning of Lot 202 DP874273, Woolgoolga, NSW, (west of Solitary Islands Way)(see enclosed plan).

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Yours faithfully,

Tim Robins  
Director/Archaeologist  
Everick Heritage Consultants



02 November 2017

Our Ref: EV.600

Gurehlgam Corporation Ltd T/A Yarrawarra  
Kenn Payne  
PO Box 1676  
GRAFTON NSW 2460

Dear Kenn,

**RE: ABORIGINAL CULTURAL HERITAGE ASSESSMENT/ABORIGINAL HERITAGE IMPACT PERMIT  
LOT 202 DP874273, WOOLGOOLGA, NSW**

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Yours faithfully,

Tim Robins  
Director/Archaeologist  
Everick Heritage Consultants





02 November 2017

Our Ref: EV.600

Mimi Mothers Aboriginal Corporation  
Marcia Hillery  
90 High Street  
BOWRAVILLE NSW 2449

Dear Marcia,

**RE: ABORIGINAL CULTURAL HERITAGE ASSESSMENT/ABORIGINAL HERITAGE IMPACT PERMIT  
LOT 202 DP874273, WOOLGOOLGA, NSW**

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Yours faithfully,

Tim Robins  
Director/Archaeologist  
Everick Heritage Consultants



02 November 2017

Our Ref: EV.600

Murrumbidgee Aboriginal Language and Cultural Co-operative Ltd  
Gary Williams  
14 Belwood Road  
Via NAMBUCCA HEADS NSW 2448

Dear Gary,

**RE: ABORIGINAL CULTURAL HERITAGE ASSESSMENT/ABORIGINAL HERITAGE IMPACT PERMIT  
LOT 202 DP874273, WOOLGOOLGA, NSW**

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Yours faithfully,

Tim Robins  
Director/Archaeologist  
Everick Heritage Consultants



02 November 2017

Our Ref: EV.600

Cultural Heritage Officer  
Gumbayngirr Native Title Group  
14 Belwood Road  
NAMBUCCA HEADS NSW 2448

To the nominated Cultural Heritage Officer,

**RE: ABORIGINAL CULTURAL HERITAGE ASSESSMENT/ABORIGINAL HERITAGE IMPACT PERMIT  
LOT 202 DP874273, WOOLGOOLGA, NSW**

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Yours faithfully,

Tim Robins  
Director/Archaeologist  
Everick Heritage Consultants



02 November 2017

Our Ref: EV.600

Cultural Heritage Officer  
Gumbayngirr Elders  
PO Box 400  
NAMBUCCA HEADS NSW2448

To the nominated Cultural Heritage Officer,

**RE: ABORIGINAL CULTURAL HERITAGE ASSESSMENT/ABORIGINAL HERITAGE IMPACT PERMIT  
LOT 202 DP874273, WOOLGOOLGA, NSW**

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Yours faithfully,

Tim Robins  
Director/Archaeologist  
Everick Heritage Consultants



02 November 2017

Our Ref: EV.600

Noel Campbell  
Ngurrala Aboriginal Corporation  
PO Box 62  
MACKSVILLE NSW 2447

Dear Noel,

**RE: ABORIGINAL CULTURAL HERITAGE ASSESSMENT/ABORIGINAL HERITAGE IMPACT PERMIT  
LOT 202 DP874273, WOOLGOOLGA, NSW**

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Yours faithfully,

Tim Robins  
Director/Archaeologist  
Everick Heritage Consultants



02 November 2017

Our Ref: EV.600

DFTV Enterprises  
5 Mountbatten Close  
RUTHERFORD NSW 2320

Dear Derrick,

**RE: ABORIGINAL CULTURAL HERITAGE ASSESSMENT/ABORIGINAL HERITAGE IMPACT PERMIT  
LOT 202 DP874273, WOOLGOOLGA, NSW**

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Yours faithfully,

Tim Robins  
Director/Archaeologist  
Everick Heritage Consultants



02 November 2017

Our Ref: EV.600

Aaron Talbott & Natalene Mercy  
6 Bando Street  
GUNNEDAH NSW 2380

Dear Aaron & Natalene,

**RE: ABORIGINAL CULTURAL HERITAGE ASSESSMENT/ABORIGINAL HERITAGE IMPACT PERMIT  
LOT 202 DP874273, WOOLGOOLGA, NSW**

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Yours faithfully,

Tim Robins  
Director/Archaeologist  
Everick Heritage Consultants



02 November 2017

Our Ref: EV.600

Jagun Elders  
Tony Perkins  
PO Box 649  
WOOLGOOLGA NSW 2456

Dear Tony,

**RE: ABORIGINAL CULTURAL HERITAGE ASSESSMENT/ABORIGINAL HERITAGE IMPACT PERMIT  
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Yours faithfully,

Tim Robins  
Director/Archaeologist  
Everick Heritage Consultants





02 November 2017

Our Ref: EV.600

Norm Archibald  
17 Flobern Ave  
WAUCHOPE NSW 2446

Dear Norm,

**RE: ABORIGINAL CULTURAL HERITAGE ASSESSMENT/ABORIGINAL HERITAGE IMPACT PERMIT  
LOT 202 DP874273, WOOLGOOLGA, NSW**

We wish to advise that we have been engaged to undertake an Aboriginal Cultural Heritage Assessment for the above mentioned study area. The land subject to assessment is situated at Bark Hut Road, Woolgoolga, NSW. The assessment will be conducted for the proposed rezoning of Lot 202 DP874273, Woolgoolga, NSW, (west of Solitary Islands Way)(see enclosed plan).

We are seeking to consult with all Aboriginal persons and organisations that may have knowledge about the history of the Project Area. Consultation will be consistent with the *Office of Environmental Heritage Aboriginal Cultural Heritage Consultation Requirements for Proponents (2010)*. If you are interested, or know of persons who may be interested, we request that you contact us by **20 November 2017** to register your interest. Please write to:

Tim Hill  
Senior Archaeologist  
Everick Heritage Consultants  
PO Box 200  
Coffs Harbour NSW 2450 /or  
[t.hill@everick.com.au](mailto:t.hill@everick.com.au)

If you have any questions about the Project, please contact Tim Hill on 0422 309 822. If you wish to find out more about our qualifications and experience in this field, please visit our website [www.everick.com.au](http://www.everick.com.au). We look forward to hearing from you.

Yours faithfully,

Tim Robins  
Director/Archaeologist  
Everick Heritage Consultants



## APPENDIX C: REGISTRATION FROM ABORIGINAL STAKEHOLDERS

**From:** Culture [mailto:Culture@coffsharboursalc.com.au]

**Sent:** Thursday, 9 November 2017 1:07 PM

**To:** Tim Hill <t.hill@everick.net.au>

**Subject:** Bark Hut Road Woolgoolga

Hi Tim,

To keep it official I am registering our interest in this project ok – thank you,

Yours in Unity

**Michelle Flanders**

Project Officer Culture & Heritage

CH&D LALC

2-3 Wongala Drive, Wongala Estate

PO Box 6150

Coffs Harbour NSW 2450

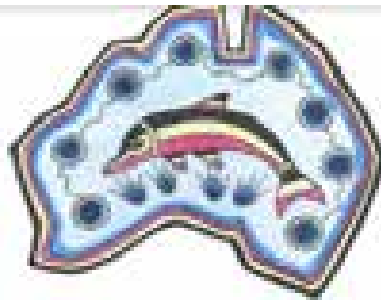
Ph: 02 6652 8740

Fax: 02 6652 5923

[culture@coffsharboursalc.com.au](mailto:culture@coffsharboursalc.com.au)

**PLEASE NOTE: I ONLY WORK ON THURSDAYS & FRIDAYS. If your enquiry requires urgent attention please contact the office on 02 6652 8740 for further assistance.**

*My office is located on Gumbaynggirr land & I pay my respect to our Elders past & present*



## Jagun Aged & Community Care

ABN: 73 116 306 546

Phone: 0417 806 239

PO Box 649 Woolgoolga NSW 2456

Everick Heritage Consultants Pty Ltd

P.O. Box 700

Coffs Harbour NSW 2450

Attention: Tim Hill

Jagun Aged and Community Care hereby register an interest in Aboriginal Cultural Heritage Assessment reconfig land from RU2 (Rural landscape) to R2 (low density residential) Woolgoolga DP874273.

Jagun will be represented by Anthony Perkins: Gumbaynggirr Elder/ Cultural Knowledge Holder, who has vast knowledge of the area.

Contact details for Anthony Perkins: mobile 0417 049 962, email [jperkins@jagunagedcare.com.au](mailto:jperkins@jagunagedcare.com.au) and postal address PO Box 649 Woolgoolga NSW 2456.

Kind regards

Simone Perkins

Program Manager

21/10/2017



## APPENDIX D: CONSULTATION NOTES 18 JANUARY 2018

**From:** Tim Hill [<mailto:t.hill@everick.net.au>]  
**Sent:** Friday, 19 January 2018 4:12 PM  
**To:** Culture; Simone Perkins; Deb Dootson  
**Cc:** Ian Brown; tony dootson; Keiley Hunter  
**Subject:** Bark Hut Road AHIP consultation/ site inspection

Hi Tony, Michelle and Deb (Ian and Tony)

Please see below my notes from the AHIP consultation meeting at Bark Hat Road Woolgoolga yesterday (18<sup>th</sup> January 2018). The meeting was attended by Uncle Tony Perkins (Jagun Elders), Ian Brown and Luana Ferguson (CHDLALC). Uncle Milton Duroux and Tony Dootson were apologies for the meeting.

### BARK HUT ROAD ISOLATED FINDS 1 & 2

- Tim Provided a background to the proposed subdivision rezoning, indicating that the rezoning would provide for lots with a Lot size of between 500-600m<sup>2</sup>. The boundaries of the area are the fenceline (to immediate west of meeting) and the Solitary Island Way and a section of and to the other side of Woopi Creek.
- Noted that the initial site inspection included Ian Brown from CHDLALC and 2 flakes were recorded on the access trail (location of meeting). The flakes were rhyolite and greywacke, they were typical of flakes from the coastal area.
- Ian Indicated that there was an outcrop of Rhyolite underneath Corindi village. Discussed the qualities of rhyolite for knapping- particularly that you needed to heat the rock to get through the cortex before knapping.
- Tim Discussed the landscape context of the site and noted that the topsoil layer was very thin and disturbed. Discussed what might have been the practice of clearing- that was likely in the 1960's or 70s.
- Mika Indicated that he bought the block in 1988 and have mostly just had it slashed since then.
- Ian Indicated that there was a walking trail through Woopi Creek down to the lake at Woolgoolga- that the lake was a teaching site.
- Tony Indicated that an old lady had a camp in the 1950's up near the Country Club Estate and that Michael McDougall had a camp across Bark Hut Road in an old packing shed.
- Noted that the old 'battle ground' was down on the creek where the Council depot is on the other side of the old highway. Described the last known use of this place and that the young man was buried in Woolgoolga Creek under a log.
- Tim Noted that two artefacts had previously been recorded in the area of the sportsfield proposal.
- Ina Thought that there were more than 2 artefacts.
- Tony Noted the problem that Council brought a lot of fill into the sportsfield area and he wasn't sure where it came from.

General discussion of management of the artefacts.

Ian Noted that he had problems with test pits in areas like this where there isn't a big site. Referred back to the excavations at Hearne's Lake ACHA study and noted they found a lot more during the ground works than they expected from the excavation results.

Tim Indicated that if the site was a large stone artefact scatter it would be visible on the ground and track. The absence of artefacts probably means it is only a low density stone artefact scatter or a small knapping area. Noted that it was unlikely to contain midden, scarred trees, unlikely to contain burials and there is no known mythological or historic sites. The main story is the connection through to St Mary's waterhole but that pathway isn't clearly understood to come through this block.

Ian Discussed the location of burials in the area and some traditional practices of burial.

General discussion of the ridge to the south of the site.



- Tony Indicated it was likely the connection to the coast was from the north-east through to Arrawarra headland and Mullaway
- Ian Noted the 'cut' along Bark Hut Road and that only some of the ridge is left intact.
- Tony Indicated that women used to carry white clay along all the ridges up to the waterhole- probably up until the 1940's. The young girls went up into the mountains before they had babies.
- Ian Suggested that test pits in this area probably wouldn't show up anything.
- Discussion of management for the site
- Cultural heritage induction for all ground clearance contractors.
  - Collection of surface artefacts by Raps and temporary storage at CHDLALC.
  - Monitoring of topsoil removal and collection of artefacts and temporary storage at CHDLALC.
  - Permanent burial of artefacts within a reserve or garden area nearby.
  - The monitoring should be in an area 20m below the access track and along the apex of the ridge to the upper/ mid slope. All the way down to Creek.
  - The monitoring should include the ridge area in the north-east of the Lot.\
  - Noted that the AHIMS site #IDs should be combined from two isolated finds to 1 single site.

#### DISCUSSION OF SOUTHERN PAD

- Tim Identified the obvious knoll- hilltop and noted that this had been identified as a PAD during the initial site inspection.
- Tony Questioned is the block was cleared in the 1960's when they built the water dam- would have been 66 or 65- that was the town water supply then.
- Ian indicated that the trees might be 30 or 40 years ld.
- Tim Questioned if test pits would be required prior to rezoning or Development consent.
- Tony Questioned if the trees would be retained or removed for the development.
- Mika Indicated the ecologist report did not specify to retain the trees.
- General discussion of a test pit program around the knoll. Conclusion that the program would be 1-2 days depending on if anything was located.
- Ian Noted that a minimum they would need to have an induction and a 'Find Procedure' which involved stopping work.
- Tim Noted that- as with the other PAD on Bark Hut Road- there was unlikely to be middens, scarred trees, burials and no known historical or mythological sites were known in the area. If there was sites they would likely be low density stone artefact scatters which have likely been disturbed when the land was cleared. Noted that there were no sites which would likely stop the development based on cultural or scientific significance.
- Ian Indicated that test pit excavations should be completed prior to going to the DA- this would clear up the matter of whether an AHIP is required or not. Discussed the delays of stopping work if artefacts are found during construction works.
- Tony Agreed that there are problems stopping work during construction and that he recommends getting an AHIP prior to starting the work.
- Tim Suggested and a Cultural Heritage Management Plan could be a minimum requirement for the rezoning.  
Noted the other sites at Hearn's Lake and McIntosh Crescent are close by and similar- both of those projects required test pit excavations.
- General discussion of the proximity of the knoll to other landmarks and access routes up Woopi Creek. Noted that the estuary is a fair way downstream- but the knoll is still a good campsite.
- Agreement to recommend test pit excavation prior to development consent to determine the requirement for an AHIP. Noted that the rezoning would be OK based on what is thought to be on the knoll.

Tim Hill BA (Hons.)

**Senior Archaeologist**



**EVERICK Heritage Consultants Pty Ltd**  
ABN 78102206682

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Fax: (07) 3368 2440  
Email: [t.hill@everick.com.au](mailto:t.hill@everick.com.au)

Web: [www.everick.com.au](http://www.everick.com.au)





## APPENDIX E: CORRESPONDENCE FROM JAGUN ELDERS

**From:** Simone Perkins [mailto:[simone@jagunagedcare.com.au](mailto:simone@jagunagedcare.com.au)]

**Sent:** Monday, 22 January 2018 8:41 PM

**To:** Tim Hill <[t.hill@everick.net.au](mailto:t.hill@everick.net.au)>

**Subject:** RE: Bark Hut Road AHIP consultation/ site inspection

Hi Tim

Tony has reviewed notes from AHIP Consultation meeting on 19/01/2018 and verifies are true and correct as per consultation discussions.

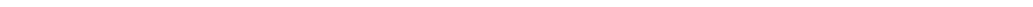
Simone Perkins

Jagun Aged Care

M: 0429 811 742

E: [simone@jagunagedcare.com.au](mailto:simone@jagunagedcare.com.au)

Website: [www.jagunagedcare.com.au](http://www.jagunagedcare.com.au)







# Bark Hut Road – Lesser Swamp-orchid

Targeted Survey Report (Draft)

November 2016

Keiley Hunter Planning



## Glossary, acronyms and abbreviations

CHCC	Coffs Harbour City Council
ECA	Ecological Constraints Analysis
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
NSW	New South Wales
TSC Act	<i>Threatened Species Conservation Act 1995</i>

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# 1 Introduction

Keiley Hunter Planning engaged Ecosure Pty Ltd (Ecosure) in June 2016, to provide an Ecological Constraints Analysis (ECA) that identified ecological constraints for possible future rezoning of two (2) parcels of land (the site) in Woolgoolga, New South Wales (NSW).

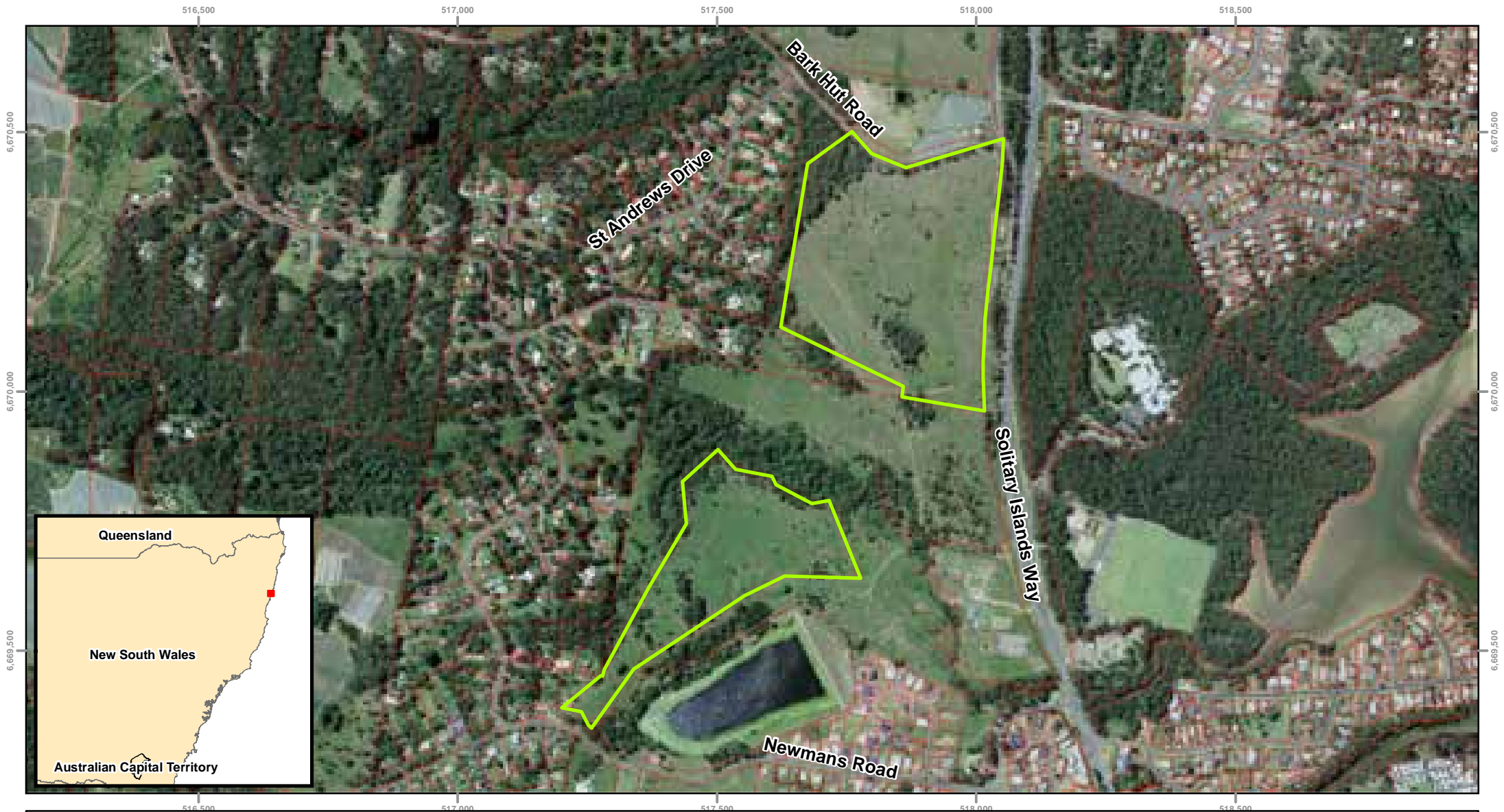
The site is located at Lot 202 DP874273 (totalling 25.64 ha) and is bisected by Coffs Harbour City Council (CHCC) reserves. The northern portion of the site (bordering Bark Hut Road) is 16.41 ha and the southern portion is 9.23 ha (Figure 1).

The ECA report (Ecosure 2016) identified five threatened flora species with the potential to occur within the site. The Lesser Swamp-orchid (*Phaius australis*) was identified as likely to occur within flood prone areas of Poundyard Creek (between the two parcels of land). It is listed as endangered under both the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and the *Threatened Species Conservation Act 1995* (TSC Act).

At a pre-planning proposal lodgement meeting, CHCC requested a targeted survey to determine the presence of Lesser Swamp-orchid. The survey was to be conducted during the known flowering time for this species (i.e. September to November).

The scope of this project included:

1. Desktop assessment
  - a. to identify potential habitat of the lesser swamp-orchid (the orchid) within and around the two parcels of land (Lot 202 DP874273; the site)
  - b. search of Bionet records to identify known locations of the orchid
  - c. liaison with relevant qualified personnel regarding known accessible locations of the orchid
2. Field survey
  - a. confirmation of presence of orchid in the local area (off site survey at known reference sites)
  - b. on site survey for the orchid in areas of potential habitat
  - c. off site survey in and around Poundyard Creek in accessible areas of potential habitat, within a 100 m (approximate) buffer of the two sites
3. Mapping of areas surveyed and locations of any orchid observed
4. A brief report outlining methods, results, maps, and recommendations.



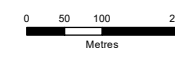
**Figure 1: Site Location**

Keiley Hunter Planning  
 PR2152 - Bark Hut Road Planning  
 Lesser Swamp-orchid

 Study site (Lot 202 DP874273)



Job number: PR1732  
 Revision: 2  
 Author: DJB  
 Date: 14/11/2016



GDA 1994 MGA Zone 56  
 Projection: Transverse Mercator  
 Datum: GDA 1994  
 Units: Meter

## 2 Methods

### 2.1 Literature review

Key background information including database searches was reviewed and included:

- Bark Hut Road Planning Proposal Environmental Investigation Report (Ecosure 2016)
- relevant databases including the Department of Energy and Environment species profile and threats database
- CHCC fine scale vegetation mapping.

Discussions with suitably qualified personnel were also conducted to determine known locations of the orchid in the area and flowering times.

Digital maps were produced with the CHCC fine scale vegetation mapping and aerial imagery for use by the project team to provide information for this report.

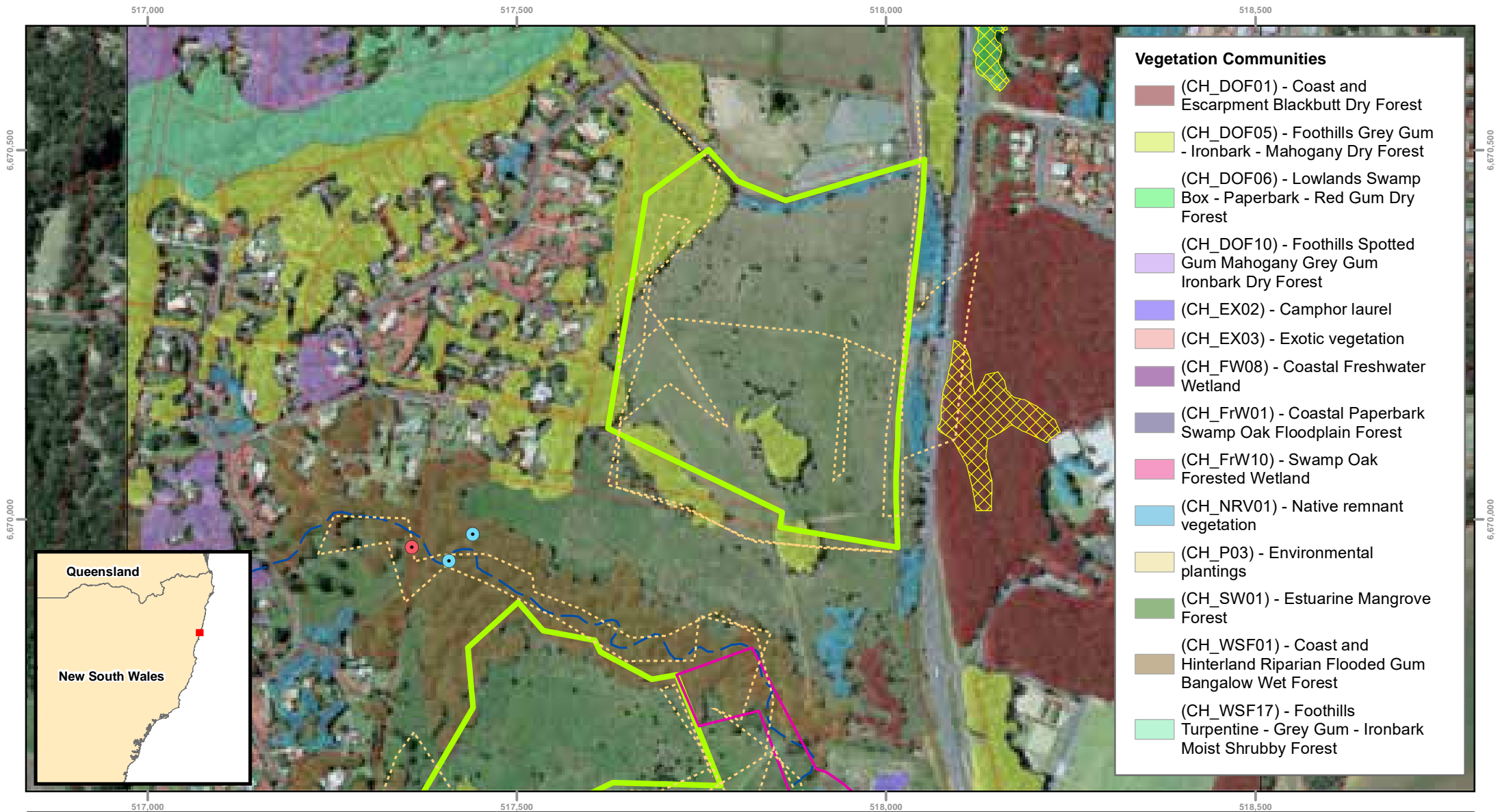
### 2.2 Off site survey – confirmation of presence in the area

Discussions were held with relevant qualified personnel who identified three locations of the orchid in the local area. One of these sites was visited to confirm presence prior to conducting the field survey.

### 2.3 Field survey – on site and off site

A targeted search for the orchid was conducted on Wednesday 9 November 2016 by a qualified ecologist. The survey concentrated on likely habitat within the site and on community land surrounding the two parcels of land. A 100 m buffer around the lot boundaries was used as a basis for the off site survey. Suitable habitat on and off site (within a general 100 m buffer) was identified through the desktop assessment and assessed during the field survey.

Within areas confirmed as potential habitat, linear transects at 10 m – 15 m spacings were searched for the orchid. All other mapped native vegetation was searched using a meandering transect (Figure 2 and Figure 3). The 100 m buffer was chosen to include potential habitat in the vicinity of the site. Community land between the two sites outside the 100 m buffer to the east was identified during the field survey as potential habitat and also surveyed.

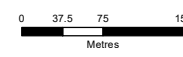


**Figure 2: Northern survey area**

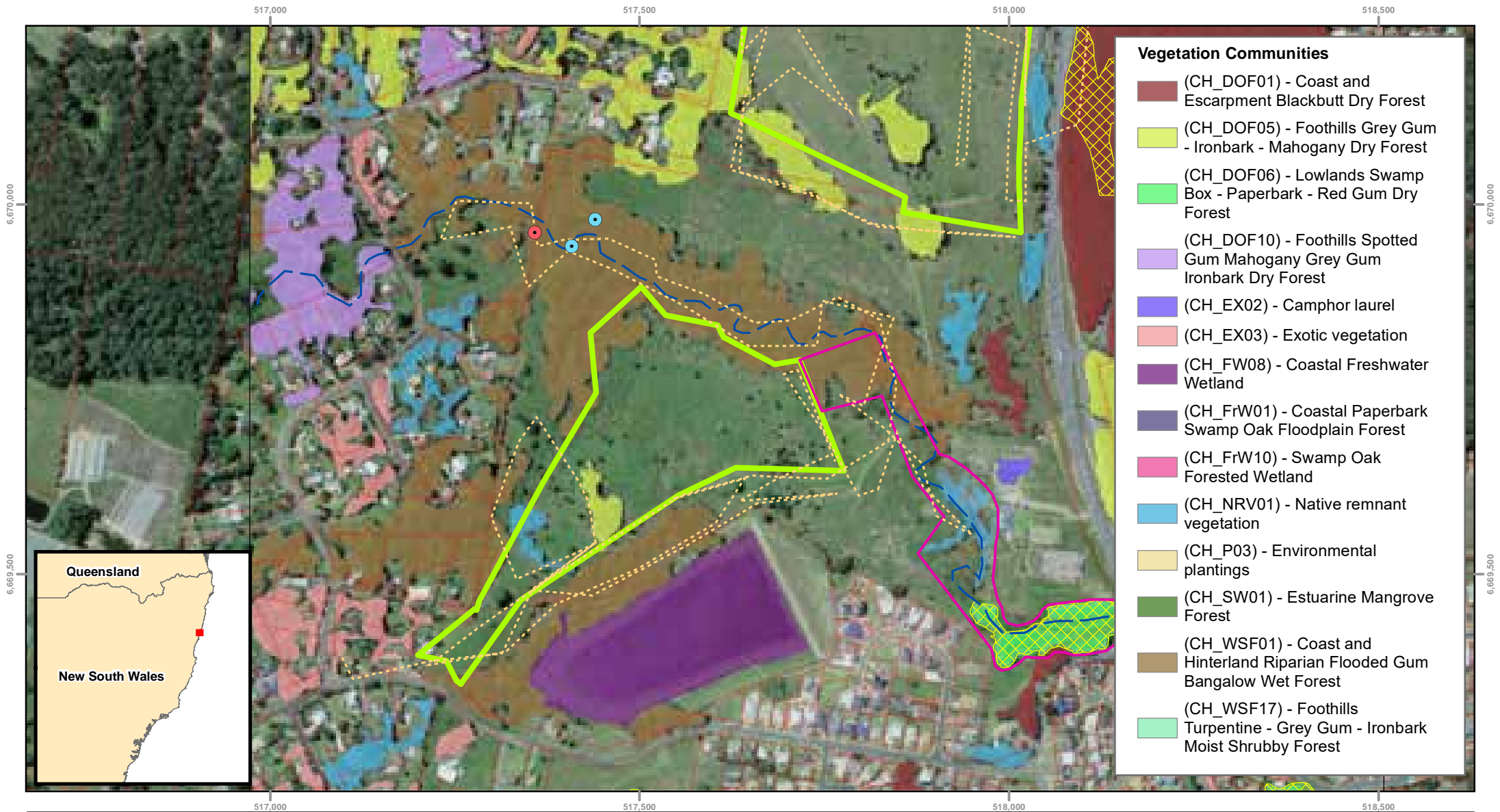
Keiley Hunter Planning  
 PR2152 - Bark Hut Road Planning  
 Lesser Swamp-orchid survey



Job number: PR2152  
 Revision: 2  
 Author: DJB  
 Date: 14/11/2016



GDA 1994 MGA Zone 56  
 Projection: Transverse Mercator  
 Datum: GDA 1994  
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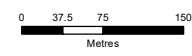


**Figure 3: Southern survey area**

Keiley Hunter Planning  
 PR2152 - Bark Hut Road Planning  
 Lesser Swamp-orchid survey



Job number: PR2152  
 Revision: 2  
 Author: DJB  
 Date: 14/11/2016



GDA 1994 MGA Zone 56  
 Projection: Transverse Mercator  
 Datum: GDA 1994  
 Units: Meter



## 2.4 Limitations

This report did not include detailed flora and fauna assessments or detailed ground-truthing of vegetation communities as the purpose of the report was to identify the presence of the Lesser Swamp-orchid. Whilst flowering of a known Lesser Swamp-orchid within the local region was confirmed at the time of survey, it does not guarantee that any specimens on site were flowering concurrently. Due to the height and density of vegetation, it would have been difficult to detect non-flowering orchids if they did exist, however narrow transects were undertaken to improve detectability.

## 3 Results and discussion

### 3.1 Literature review

A review of relevant publications and databases identified that the orchid is generally found in and adjacent to inundated or periodically inundated vegetation communities including coastal wet heath, freshwater wetlands, swamp grasslands, swamp forest, swamp rainforest and swamp sclerophyll forest (Barry 2005; Benwell 1994b; Bishop 1996; Harden 1993; NSW DECCW 2005). It is usually found where Broad-leaved Paperbark (*Melaleuca quinquenervia*) and Swamp Mahogany (*Eucalyptus robusta*) occur (Sparshott & Bostock 1993, NH NSW 2006), and where rainforest communities feature, including where Bangalow Palm (*Archontophoenix cunninghamiana*) or Cabbage Tree Palm (*Livistona australis*) are present (Benwell 1994b; Bishop 1996; Harden 1993).

The site consists mainly of cleared land with exotic grasses and patches of native vegetation. A review of CHCC's online mapping viewer (CHCC 2016) indicated the dominant mapped vegetation within the 100 m buffer surveyed was (CH\_WSF01) - Coast and Hinterland Riparian Flooded Gum Bangalow Wet Forest. This community is predominately mapped around Poundyard Creek and enters the northern boundary of the southern land parcel (as well as a small section in this parcel's southern boundary. (CH\_DOF05) - Foothills Grey Gum - Ironbark - Mahogany Dry Forest - occurs in patches on and off site in the 100 m buffer. There are also areas of (CH\_DOF01) - Coast and Escarpment Blackbutt Dry Forest - to the east of the site, (CH\_FW08) - Coastal Freshwater Wetland - adjoining the southern boundary and smaller patches of (CH\_NRV01) - Native remnant vegetation (Figure 2 and Figure 3).

The desktop assessment identified the areas of CH\_WSF01 around Poundyard Creek, CH\_FW08 adjoining the southern boundary and smaller patches of CH\_NRV01 in the south east corner as the most likely habitat for the orchid.

### 3.2 Off site survey

Discussions with local qualified personnel provided three known locations of the orchid in the area i.e. within a residential property in Sawtell, Coffs Harbour Botanic Gardens and a site near Coffs Harbour airport.

Of the three sites, one was confirmed as currently flowering (residential garden, Sawtell) (pers com Peter Richards, Senior Botanist). The orchids at the Botanic Gardens had completed flowering (pers com Alex Floyd, Curator) and an inspection of the specimen near the Coffs Harbour Airport indicated that it had not flowered this season and there was no evidence to indicate it would flower this season (pers com Peter Richards).

### 3.3 Field survey

Survey timing (9<sup>th</sup> November 2016) coincided with the usual flowering period (September to November) for the species (Benwell 1994b). No individuals or populations of the orchid were found during the site survey.

Areas identified as potential habitat adjacent to Poundyard Creek and mapped as (CH\_WSF01) - Coast and Hinterland Riparian Flooded Gum Bangalow Wet Forest - were not swampy and did not contain species usually associated with the orchid. Lantana dominated the mid and understorey either side of Poundyard Creek. The heavy infestations of lantana made linear transects difficult to conduct and considerably reduced the potential habitat for the orchid in this area.

Riparian rainforest species occurred in a narrow strip both sides of Poundyard creek and transitioned up steep banks into sclerophyll communities dominated by Flooded Gum (*Eucalyptus grandis*), Tallowwood (*Eucalyptus microcorys*), Small Fruited Grey Gum (*Eucalyptus propinqua*), Grey Ironbark (*Eucalyptus siderophloia*) and Coastal Blackbutt (*Eucalyptus pilularis*). Despite the presence of rainforest species none of the (CH\_WSF01) - Coast and Hinterland Riparian Flooded Gum Bangalow Wet Forest was swampy and no Broad-leaved Paperbark or Swamp Mahogany occurred.

Areas to the north of the creek did not contain suitable habitat. Areas under tree cover were mainly dominated by Coastal Blackbutt and were considered too dry for the species to exist. Parallel to the eastern boundary, a north south gully has been cleared and grazed. Although swampy in the bottom of this gully, previous management practices and the resulting vegetation makes this area unlikely to contain the orchid. To the south of the creek tall blady grass and bracken fern dominated the site. These areas were not considered likely habitat.

The survey identified that the areas of CH\_NRV01 in the south east corner of the site, where Poundyard Creek widens into overflow channels and associated freshwater wetlands, were the most likely habitat for the orchid. This area (approximately 250 m from the eastern boundary of the southern portion of the site and therefore outside the 100 m buffer) contained fenced-off tree plantings, tall ferns, grasses and sedges. A search of this area revealed no orchids. If a non flowering orchid existed in this area it would have been difficult to detect due to the height and density of existing vegetation. Due to the distance of this area from the property boundary, if located, it would be expected that any impacts could be mitigated.

The CH\_FW08 - Coastal Freshwater Wetland adjoining the southern boundary was a large dam. The adjoining mapped (CH\_WSF01) - Coast and Hinterland Riparian Flooded Gum Bangalow Wet Forest was dominated by exotic pine with occasional Tallowwood trees. No suitable orchid habitat was recorded in this area.

#### 3.3.1 Additional observations

Two species located on the site, with similar leaf formation to the orchid, were positively identified as Cocos Palm (*Syagrus romanzoffiana*) and Cabbage Tree Palm seedlings.

Two NSW threatened flora species were recorded in the western section of Poundyard Creek (Figure 3), approximately 135 m from the northwestern corner of the southern portion of the site. These were Fine-leaved Tuckeroo (*Lepiderema pulchella*) and Rough-shelled Bush Nut (*Macadamia tetraphylla*). Both of these species are listed as Vulnerable in NSW under the TSC Act; however the records of both these species at this site are considered to be outside their normal distribution.

Fine-leaved Tuckeroo normally occurs north of the Brunswick River and mainly in the Tweed Valley in north east NSW (OEH 2014). This species is commonly used in landscaping and is attractive to birds; its presence at the site may be due to seed dispersal by birds.

Rough-shelled Bush Nut usually occur north of the Clarence River (OEH 2014b). A database search conducted as part of the constraints report (Ecosure 2016) identified this species as potentially occurring within 5 km of the project area. It was considered unlikely to occur as there is no rainforest habitat mapped within the site. Although not likely to have been introduced by birds, it is possible this species was introduced to the site from nearby residential gardens during a previous flood event.

## 4 Conclusion

At the time of the survey, no lesser swamp orchid were located on the site or in the potential habitat surveyed on community land surrounding the site. No potential habitat for the orchid was identified on site. The most suitable potential habitat occurred to the south-east of the site where restoration works had occurred. No orchids were observed in this area, however it should be noted that the height and density of this vegetation made detection of any non-flowering orchids extremely difficult. This potential habitat was a considerable distance from the project site (approximately 250 m from the eastern corner of the southern site).

Two threatened flora species were located off site, approximately 135 m from the southern site's northwestern boundary, with their location shown on Figure 2. Whilst these specimens are considered to be outside their natural range and a considerable buffer is provided between the site boundaries and their location, it is recommended that their presence is considered in future developments to ensure that they are protected.

CHCC has requested this survey to determine the feasibility of future re-zoning of the site – Lot202 DP874273. More detailed flora and fauna assessments may be required to meet CHCC's Gateway requirements. No orchids were detected on or off site at the time of the survey, and no suitable habitat was observed on site. A precautionary approach is recommended to guide future management for areas off site as height and density of some vegetation may have prevented detection of non-flowering orchids. A substantial buffer exists between the boundary of the two sites and the potential orchid habitat to the east. To mitigate any potential adverse impacts to the potential habitat as a result of future development, it is recommended that appropriate erosion and sediment control during construction is implemented as well as appropriate hydrological and storm water management.

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## Revision History

Revision No.	Revision date	Details	Prepared by	Reviewed by	Approved by
00	16/11/16	Bark Hut Road Lesser Swamp-orchid survey report	Trudy Thompson Senior Environmental Scientist	Gillian McLeay Senior Environmental Planner	Beth Kramer Senior Environmental Scientist

## Distribution List

Copy #	Date	Type	Issued to	Name
1	16/11/16	Electronic	Keiley Hunter Planning	Keiley Hunter
2	16/11/16	Electronic	Ecosure	Administration

Citation: Ecosure (2016), Bark Hut Road Lesser Swamp-orchid, Report to Keiley Hunter Planning, Publication Location – Coffs Harbour

Report compiled by Ecosure Pty Ltd

ABN: 63 106 067 976

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PR2152-RE.Bark Hut Road Lesser Swamp-orchid

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### Coffs Harbour

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# Newmans Road – Southern Precinct Ecological Assessment

Final Report  
September 2018

Keiley Hunter Urban Planner



## Glossary, acronyms and abbreviations

BC Act	<i>Biodiversity Conservation Act 2016</i>
APZ	Asset Protection Zone
BC Act	<i>Biodiversity Conservation Act 2016</i>
CHCC	Coffs Harbour City Council
CHLC	Coffs Harbour Landscape Corridors
CKPoM	Comprehensive Koala Plan of Management
CZMP	Coastal Zone Management Plan
DCP	Development Control Plan
EEC	Endangered ecological community
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
HVH	High valued habitat
LEP	Local Environment Plan
OEH	Office of Environment and Heritage
PCT	Plant community type
SAT	Spot assessment technique
TEC	Threatened Ecological Community
TSC Act	<i>Threatened Species Conservation Act 1995</i>
VMP	Vegetation Management Plan

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# 1 Introduction

## 1.1 Overview

Keiley Hunter Urban Planner engaged Ecosure Pty Ltd (Ecosure) to conduct an ecological assessment of part Lot 202 DP874273 (southern precinct) in Woolgoolga, west of the Pacific Highway, 30 km north of Coffs Harbour, New South Wales. The subject land borders Newmans Road to the south and Poundyard Creek to the north and has a total area of 9.23 ha (Figure 1). The assessment is necessary in order to meet state and local government requirements for a planning proposal for the subject land. The concept design for the preliminary proposal is provided as Appendix 1.

The *Biodiversity Conservation Act 2016* (BC Act) commenced on 25 August 2017 with transitional provisions in place for the Coffs Harbour Local Government Area until 25 November 2018. Under Part 7 of the BC Act (Savings and Transitional) Regulation 2017, Council can assess DAs under the former planning provisions. Accordingly, this report has been prepared in accordance with the threatened species impact assessment requirements under Section 94 of the *Threatened Species Conservation Act 1995* (TSC Act).

The project scope included:

- a literature review which included findings from the constraints analysis (Ecosure 2016a), recommendations from the Northern Councils Review of Environmental Zonings (DPE 2015), and relevant Coffs Harbour City Council (CHCC) Local Environment Plan (LEP), Development Control Plan (DCP), policies and guidelines
- an assessment of fauna habitat particularly for threatened fauna species likely to occur based on findings from the constraints analysis (including identification of landscape features such as dry slopes and wet areas, features that could provide habitat including dead wood and dead trees, identification of hollow-bearing trees, searches for distinctive scats and scratches on trees, and identification of nests and assessment of culverts and drainage lines)
- a modified koala Spot Assessment Technique (SAT) survey targeting primary koala feed trees if they occur on-site and a review of mapped koala habitat including the consideration of Council's Comprehensive Koala Plan of Management (CKPoM)
- a flora assessment that ground-truthed vegetation communities in accordance with NSW Plant Community Types (PCTs) and Council's fine scale vegetation mapping (OEH 2012a).
- a targeted search for threatened flora species identified as potentially occurring on the site
- detailed mapping identifying potential E3 – Environmental Management zoned land

- an assessment of potential habitat linkages associated with the subject area.

## 1.2 Site description

The subject area falls within the North Coast Bioregion and the Coffs Coast and Escarpment Interim Biogeographic Regionalisation of Australia sub-region. The eastern boundary is located approximately 1 km from the eastern seaboard and would be influenced by the maritime environment depending on wind direction and speed. The land is gently sloping, rarely exceeding 10 degrees. There are no major landscape features associated with the site, such as karst, caves, crevices, cliffs and areas of geological significance.

The project area is mostly cleared with scattered patches of vegetation. Small patches of dry sclerophyll forest are present with wet sclerophyll forest in the gullies and creek lines. Poundyard Creek flows just to the north of the southern precinct (Figure 1) although the stream and its banks fall outside the lot boundaries of the subject area.

The southern precinct is geographically separated by Poundyard Creek and council owned land currently being developed for the purposes of a community sports field. The western boundary of the southern precinct is bounded by residential development while the eastern portion adjoins Council land including a large dam. The entry point to the southern precinct is Newmans Road and is part of west Woolgoolga.



**Figure 1: Site location**

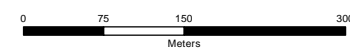
Keiley Hunter Urban Planner

Newmans Road EA

 Project area



Job number: PR3278  
 Revision: 0  
 Author: DJB, KF  
 Date: 28/08/2018



GDA 1994 MGA Zone 56  
 Projection: Transverse Mercator  
 Datum: GDA 1994  
 Units: Meter

## 2 Methods

### 2.1 Literature review

The following information was reviewed:

- previous reports including Bark Hut Road Planning Proposal-Environmental Investigation Report (Ecosure 2016a) and Bark Hut Road Lesser Swamp-orchid (Ecosure 2016b)
- relevant biodiversity databases (i.e. NSW BioNet and the EPBC Act Protected Matters Search) for flora and fauna records
- vegetation community mapping data (OEH 2012a)
- plant community types (OEH 2017) and fine-scale vegetation mapping (OEH 2012b)
- preliminary layout design plan (Appendix 1)
- review of relevant legislation, plans and policies including relevant sections of the CHCC LEP (CHCC 2013) and the Coffs Harbour Comprehensive Koala Plan of Management (CHCC 1999).
- review of Landscape Corridors of the Coffs Harbour Local Government Area (CHCC 2015)
- Northern beaches kangaroo management plan (CHCC 2017)
- Woolgoolga Lake Estuary Coastal Zone Management Plan (GeoLink 2013).

### 2.2 Flora assessment

Flora surveys were undertaken in the southern precinct on the 3<sup>rd</sup> November 2017. Sampling of the site involved the “random meander” transect method (Cropper 1993) and targeted sampling within each mapped vegetation community area. Mapped vegetation communities were ground truthed and dominant species within each vegetation patch were assessed and matched to NSW Office of Environment and Heritage (OEH) PCTs. Vegetation was also matched against vegetation community profiles within the *Development of a Fine-scale vegetation map for the Coffs Harbour local government area volume 2: vegetation community profiles* (OEH 2012b).

A GPS enabled digital tablet was used to compare the location of existing mapped ecosystems to the communities occurring in the field. Where differences between mapped and actual ecosystems were observed, the ground truthed communities were mapped and used to produce an updated vegetation communities map. Targeted searches for threatened flora species within each vegetation community were undertaken.

The areas that did not contain native vegetation (i.e. land not included in native vegetation extent) required no further assessment.

## 2.3 Fauna habitat assessment including modified SAT

Fauna habitat and opportunistic fauna sightings were recorded within and adjacent to the site as follows:

- Opportunistic fauna sightings were recorded throughout the day.
- Targeted assessments for threatened fauna and associated fauna habitat were undertaken with a particular focus on koala feed tree species and hollow-bearing trees.
- Modified SAT surveys were conducted in areas of remnant. For each area, 25 trees were surveyed for a period of two minutes per tree to determine presence/absence of koala scat.
- Populations of the eastern kangaroo (*Macropus giganteus*) were estimated in the southern precinct.

## 2.4 Bushfire threat analysis

The proposed design layout (Appendix 1) was reviewed to determine potential location of infrastructure including roads and building envelopes. Vegetation and slope were inspected on 25<sup>th</sup> September to make a preliminary determination of bushfire threat associated with the proposed layout design.

The vegetation assessment associated with this report will be used to inform a comprehensive bushfire report being prepared by Holiday Coast Bushfire Solutions.



## 3 Results

### 3.1 Literature review

Various reports, databases, and maps were reviewed to gain an understanding of the characteristics of the site and potential environmental constraints.

#### Previous reports

Findings from the desktop constraints analysis (Ecosure 2016a) and the targeted survey for the southern swamp-orchid (*Phaius australis*) (Ecosure 2016b) identified the following:

- the majority of the site is considered to be of low ecological value. An area in the north and northwestern part of the southern precinct is considered of high ecological value
- patches of vegetation scattered throughout the southern precinct are considered of medium ecological value
- secondary koala habitat is mapped on the site
- riparian areas and zones of high ecological value should be retained.

A summary of potential environmental constraints was provided and indicated that no high valued habitats have been mapped on the site (Ecosure 2016a) (Table 1).

Table 1 Potential environmental constraints (only those applicable to the site have been included)

Operational Layer	Result		Details
Coffs Harbour City LEP 2013	Natural resource waterways	n/a	Drainage line associated with Poundyard Creek flows to the north of the southern precinct of Lot 20 2DP874273
	Land zoning	RU2	Rural landscape
	Potential Acid Sulphate Soils	Class 3	Southern precinct - northern tip Southern precinct – along northern border
Constraints	Acid Sulphate Soils	Class 5 Class 4	Southern precincts Southern precinct - north western tip
	Koala Habitat	Secondary	Southern precincts contain some patches
	SEPP71 Coastal Policy	yes	Relevant to southern precinct
Bushfire prone mapping	Fire Prone Vegetation Categories	Category 1	Tip of southern precinct
	Fire Prone Vegetation Buffers	100m buffer	Southern precincts
Flooding information	Flood planning area	Yes	Southern precinct – northern tip
	AEP flood extents	Yes	Southern precinct – along northern border
Coffs Harbour Fine Scale Vegetation Mapping	Remnant native vegetation	Yes	Southern precinct (CH_NRV01)
	Wet sclerophyll forests	Yes	Southern precinct (CH_WSF01)

Operational Layer	Result	n/a	Details
High Valued Habitats (HVH)	Endangered ecological communities (EECs)	n/a	Likely EECs are mapped to occur within one (1) km of project area however no EEC are mapped to occur within the project area

A targeted survey for the southern swamp-orchid, determined to potentially occur on the site, did not locate the species nor was any potential habitat for the species identified on the site (Ecosure 2016b). Vegetation mapping by OEH identifies three communities within the site (Figure 2).

## 3.2 NSW BioNet and EPBC Act Protected Matters Searches

A search of NSW BioNet records within 5 km of the site returned 47 species listed as threatened under the *Biodiversity Conservation Act 2016* (BC Act), (Appendix 2). A 5 km *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) Protected Matters search returned 73 threatened species and 51 migratory species (Appendix 3).



The EPBC search also returned three threatened ecological communities (TECs).

As the NSW BioNet search returns actual records of threatened species (while the EPBC Act Protected Matters Search returns all species possibly occurring), only the BioNet records have been included and discussed in relation to their likelihood of occurrence (Table 2 and Table 3). It should be noted that this analysis excludes species found in the ocean (e.g. whale, turtle, etc.) and marine dependent birds. Locations of threatened species records are mapped in Figure 3.



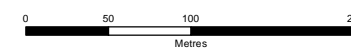
**Figure 2: Plant community types (PCT)**

Keiley Hunter Urban Planner  
Newmans Road EA

 Project area  
 Property boundary



Job number: PR2836  
Revision: 0  
Author: DJB  
Date: 10/11/2017



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Projection: Transverse Mercator  
Datum: GDA 1994  
Units: Meter

Table 2 Likelihood of occurrence of threatened flora species recorded within 5 km of the site

Scientific name	Common name	EPBC Act status	BC Act status	Likelihood of occurrence	Potential site impacts
<i>Hicksbeachia pinnatifolia</i>	red boppel nut	V	V	Unlikely. Occurs in rainforest habitat which is not mapped within the site.	Very minimal, unlikely to occur within development footprint
<i>Macadamia tetraphylla</i>	rough-shelled bush nut	V	V	Unlikely. Occurs in rainforest habitat which is not mapped within the site.	Very minimal, unlikely to occur within development footprint
<i>Marsdenia longiloba</i>	slender marsdenia	V	E	Possible. Associated with vegetation community CH_WSF01 which is mapped to occur within the project area.	Minimal, species likely to occur outside the development footprint
<i>Niemeyera whitei</i>	rusty plum, plum boxwood		V	Possible. Associated with vegetation community CH_WSF01 with a single record to the north of the subject land. Despite this record targeted searches did not find this species.	Minimal, species likely to occur outside the development footprint
<i>Phaius australis</i>	southern swamp orchid	E	E	Possible, but only in flood prone areas of Poundyard Creek. This species has been heavily impacted by illegal collection.	Minimal, not likely to occur within the development footprint.

Key: BC Act: E1 Endangered, P Protected, V Vulnerable

EPBC: E Endangered, V Vulnerable

Table 3 Likelihood of occurrence of threatened fauna species recorded within 5 km of the site

Class	Scientific name	Common name	EPBC Act status	BC Act status	Likelihood of occurrence	Potential site impacts
Amphibia	<i>Mixophyes iteratus</i>	giant barred frog	E	E1	Unlikely Found along freshwater streams with permanent or semi-permanent water, generally (but not always) at lower elevation. Generally associated with deep leaf litter for shelter and foraging.	There are no permanent streams or creeks associated with either the southern precinct so the proposal is very unlikely to have any impact on this frog. Surveys may locate this species in Poundyard Creek but appropriate sediment and erosion control measures will mitigate any impacts on the creek.
Birds	<i>Ephippiorhynchus asiaticus</i>	black-necked stork		E1	Unlikely. More likely associated with estuarine areas further to the east and large dam to the east of the southern precinct. There is a single record east of the southern precinct near the large council dam.	Negligible, there is no suitable habitat available for the black-necked stork.
Birds	<i>Ardea ibis</i>	cattle egret	C,J (migratory)		Possible. Occurs in tropical and temperate grasslands and woodlands which is mapped to occur within project area.	Negligible, there is no suitable habitat available for the cattle egret.
Birds	<i>Hirundapus caudacutus</i>	white-throated needletail	C,J,K		Possible. High flying species occurring in Australia only between late spring and early autumn. The species is unlikely to be recorded perching but may be seen above the subject site.	Negligible, the species is almost exclusively aerial in Australia over a wide range of habitats.
Birds	<i>Stictonetta naevosa</i>	freckled duck		V	Unlikely. More likely associated with estuarine areas further to the east and large dam to the east of the southern precinct.	Negligible, there is no suitable habitat available for the duck in the southern precinct although suitable waterbodies occur to the east of the site.
Birds	<i>Ptilinopus magnificus</i>	wompoo fruit-dove		V	Possible. May occur in wet sclerophyll forest within Poundyard Creek but unlikely to occur within the southern precincts.	Negligible, this dove generally prefers high quality habitat including rainforest, neither of which occurs on site.
Birds	<i>Ixobrychus flavicollis</i>	black bittern		V	Unlikely. More likely associated with estuarine areas further to the east and large dam to the east of the southern precinct.	Negligible, there is no suitable habitat available for the bittern in the southern precinct. Adjoining council land associated with Poundyard Creek may have some suitable habitat.

Class	Scientific name	Common name	EPBC Act status	BC Act status	Likelihood of occurrence	Potential site impacts
Birds	<i>Haliaeetus leucogaster</i>	white-bellied sea-eagle		V	Likely. Found in coastal habitats and may be flying over the project area.	The sea-eagle may be an itinerant visitor to the subject site as there are known nesting pairs further to the east along the coast, however, there are no large water bodies associated with the site which would provide suitable foraging habitat. Similarly, there are no large tree stags for nesting.
Birds	<i>Lathamus discolor</i>	swift parrot	CE	E	Possible. Occurs on the coast and inhabits dry sclerophyll eucalypt forest which is mapped to occur within project area.	All consolidated areas of remnant vegetation will be retained, limiting any impact on the foraging resources of this parrot.
Birds	<i>Grus rubicunda</i>	brolga		V	Unlikely. Occurs in open grassland habitat including pasture which is mapped to occur within the project area.	Negligible, there is no suitable habitat available for the brolga in the southern precinct although suitable waterbodies occur to the east of the site.
Birds	<i>Irediparra gallinacea</i>	comb-crested jacana		V	Unlikely. More likely associated with estuarine areas further to the east and large dam to the east of the southern precinct.	Negligible, there is no suitable habitat available for the jacana in the southern precinct although suitable waterbodies occur to the east of the site.
Birds	<i>Daphoenositta chrysoptera</i>	varied sittella		V	Possible. Some suitable foraging habitat may be available in the remnant areas associated with the southern and northern precinct.	All consolidated areas of remnant vegetation will be retained within the precinct, limiting any impact on the foraging resources of the sittella.
Birds	<i>Calyptorhynchus lathamii</i>	glossy black-cockatoo		V	Possible. Occurs in open woodlands on the coastline and is highly dependent on vegetation where <i>Allocasuarina</i> sp is present, which may occur within the project area.	There are scattered <i>Allocasuarina</i> along the northern boundary of the southern precinct. No consolidated areas of habitat are proposed for removal as part of the development proposal. Additionally all remnant vegetation is proposed to be protected under an E3 zone.

Class	Scientific name	Common name	EPBC Act status	BC Act status	Likelihood of occurrence	Potential site impacts
Birds	<i>Pandion cristatus</i>	eastern osprey		V	Possible. More likely associated with estuarine areas further to the east and large dam to the east of the southern precinct	The osprey may be an itinerant visitor to the subject site as there are known nesting pairs further to the east along the coast, however, there are no large water bodies associated with the site which would provide suitable foraging habitat. Similarly, there are no large tree stags for nesting.
Birds	<i>Ninox strenua</i>	powerful owl		V	Possible. Inhabits a range of vegetation types including woodland and open sclerophyll forest to tall open wet forest (including fragmented landscapes) which is mapped to occur within the project area.	The powerful owl may utilise the site for foraging but there are no hollow-bearing trees suitable for breeding. All consolidated areas of remnant vegetation on the site are proposed to be protected under environmental zoning.
Mammals	<i>Dasyurus maculatus</i>	spotted-tailed quoll	E	V	Possible. As a wide ranging landscape species the quoll could find suitable foraging habitat in the remnant forest located on the southern precinct.	Negligible, no consolidated areas of remnant vegetation are being removed as part of the proposal, however the species is wide ranging and falls in to the landscape species management stream. Quolls are likely to benefit from movement habitat linkages across the local area.
Mammals	<i>Phascolarctos cinereus</i>	koala	V	V	Possible. There is mapped secondary koala habitat mapped across the subject area and three records from vegetation associated with Poundyard Creek.	There are three BioNet records associated with Poundyard Creek, this land is not part of the development footprint and is likely to continue to act as a movement corridor for koalas. All consolidated remnants of native vegetation, including primary koala food trees, are proposed to be protected on the development site under environmental zoning. The planting of primary koala food trees within the indicative habitat linkages, as part of the proposed VMP, will consolidate habitat resources for the koala.



Class	Scientific name	Common name	EPBC Act status	BC Act status	Likelihood of occurrence	Potential site impacts
Mammals	<i>Pteropus poliocephalus</i>	grey-headed flying-fox	V	V	Likely. Occurs in tall open forest and forages in flowering trees of rainforests, eucalypts, paperbarks and banksias which may be present within the project area	May utilise flowering eucalypts and paperbarks on a seasonal basis, A large flying fox camp located further east may increase the chances that habitat in the area is utilised by the grey headed flying fox. All consolidated areas of remnant vegetation on the site are proposed to be retained under environmental zoning.
Mammals	<i>Kerivoula papuensis</i>	golden-tipped bat		V	Recorded from southern precinct. Occurs in dry eucalypt forest and wet sclerophyll forest which is mapped to occur within the project area.	This bat may utilise the site for foraging but all consolidated areas of remnant vegetation on the site are proposed to be retained under environmental zoning.

Key: BC Act: E1 Endangered, V Vulnerable

EPBC: CE Critically endangered, E Endangered, V Vulnerable,



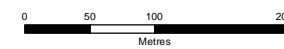
**Figure 3: Threatened species records (Bionet)**

Keiley Hunter Urban Planner  
Newmans Road EA

Project area	<b>Threatened fauna species</b>	Koala
Property boundary	Black-necked Stork	Spotted-tailed Quoll
<b>Threatened flora species</b>	Freckled Duck	Golden-tipped Bat
Rusty Plum, Plum Boxwood		



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Date: 24/11/2017



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Datum: GDA 1994  
Units: Meter

## 3.3 Flora assessment

Appendix 4 lists flora species identified during field surveys. No threatened species were recorded. Ground-truthing of the PCT boundaries was confirmed to be correct and the PCTs matched the NSW BioNet Vegetation Classification, see Figure 2. These vegetation communities are also confirmed against the equivalent LGA fine-scale vegetation mapping (OEH 2012a).

### 3.3.1 Threatened flora

The desktop assessment identified five threatened flora species within 5 km of the site. A site survey targeting the southern swamp-orchid (*Phaius australis*), listed as endangered under both the EPBC Act and the 2016 BC Act, did not locate this species (Ecosure 2016b).

There is a single rusty plum record to the north of the subject land, although this appears to be erroneous as the coordinates place the record in the middle of long since cleared area. Targeted searches did not locate this species in nearby remnant vegetation or anywhere else across the subject site.

Similarly, targeted searches did not detect the other three threatened flora species returned in the 5km BioNet search including slender marsdenia, red boppel nut and rough-shelled bush nut.



Plate 1. Remnant vegetation associated with biolink looking east towards dam



Plate 2. Example of isolated paddock tree (*Lophostemon confertus*)

### 3.3.1 Endangered ecological communities

The EPBC Act Protected Matters Search identified three listed TECs as likely to occur within the area. These are:

- Littoral Rainforest and Coastal Vine Thickets of Eastern Australia TEC listed as critically endangered under the EPBC Act. This community is analogous to Littoral Rainforest in the South East Corner, Sydney Basin and NSW North Coast Bioregions which is listed as a TEC under the BC Act.
- Lowland Rainforest of Subtropical Australia TEC listed as critically endangered under the EPBC Act. This community is analogous to Lowland Rainforest in the NSW North Coast and Sydney Basin Bioregions which is listed as a TEC under the BC Act.
- Subtropical and Temperate Coastal Saltmarsh TEC listed as vulnerable under the EPBC Act. This community is analogous to Coastal saltmarsh in the NSW North Coast, Sydney Basin and South East Corner bioregions which is listed as a TEC under the BC Act.

Ground truthing did not detect any of the EPBC Act listed TECs.

## 3.4 Fauna habitat assessment and modified SAT

Appendix 5 lists fauna species identified by timed bird surveys and opportunistic sightings. Forty-seven species of bird and one mammal (Eastern grey kangaroo) were observed. No threatened species were recorded.

The site does provide marginal habitat as part of a larger connected network of linear vegetated strips across the local landscape. Given the site's proximity to urban development and that the majority of the site is cleared, the fauna habitat present is low to medium.

There are some isolated patches of brushbox (*Lophostemon confertus*) and tallowwood (*Eucalyptus microcorys*) in the southern end of the southern precinct which are less than 80 years old. There are two much larger brushbox that may exceed 150 years old but neither is currently hollow-bearing. Portions of the northern end of this lot are being invaded by wildling slash pine (Plate 3). There are no large diameter hollow-bearing trees associated with this precinct. The remainder of the site is dominated by exotic grasses and perennial weeds perpetuated by regular slashing of the site.



Plate 3. Young slash pine forest associated with the southern precinct

## Comprehensive Koala Plan of Management (CKPoM)

The southern precinct contains secondary koala habitat along the northern boundary which is associated with riparian vegetation along Poundyard Creek. There is no other koala habitat mapping associated with the southern precinct, see Figure 4.

Primary and secondary koala feed trees were surveyed including areas mapped as secondary koala habitat under Councils CKPoM (Lunney et al. 1999). No koalas were sighted or distinctive scats found on the site based on the modified SAT assessment of 25 trees within the southern precinct.

While there are no koala records associated with the subject area, there are three NSW BioNet records located close to Poundyard Creek where council owned land adjoins the site at its northern extremity, Figure 4. These koala records are quite old having been observed between 2004 – 2006 as part of a community wildlife survey, Figure 4. It is reasonable to assume that koalas use this riparian corridor to move across the landscape. There are also primary koala food trees including *Eucalyptus tereticornis* and *Eucalyptus grandis*, located within this riparian corridor.

The proposed development will not remove any secondary koala habitat or remove any of the primary koala food tree species including tallowwood (*Eucalyptus microcorys*), swamp mahogany (*E. robusta*), flooded gum (*E. grandis*), forest red gum (*E. tereticornis*), or small-fruited grey gum (*E. propinqua*).

Retention of all the large remnant areas of native vegetation will ensure the development will not destroy, damage or compromise the values of the land as koala habitat.

The proposal will not result in significant barriers being established to koala movement by ensuring habitat linkages are enhanced through implementation of a VMP to improve the habitat availability for koalas where appropriate. A proposed biolink through the centre of the site will provide an important movement corridor between vegetation located on the eastern and western side of the subject land. The biolink also contains semi-mature eucalypts that will be protected as part of this planning proposal.

Additionally, boundary fencing will not prevent the free movement of koalas, although it may be necessary to erect exclusion fencing to prevent koalas from entering areas where there is high usage by people, vehicles and dogs.

New local roads will be designed to reduce traffic speed to 40 kph where roads cross identified wildlife corridor areas. It may be necessary to exclude all dogs from areas set aside for wildlife corridor management.

## Kangaroo assessment

Eastern grey kangaroo counts across the southern precinct returned 45 individuals. Council owned land to the north of the southern precinct is the subject of ongoing construction for the purposes of sporting fields. That area contains a large resident population of approximately 145 kangaroos. At the time of the site assessment, this large mob was taking advantage of



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the new growth associated with the fields. Based on diurnal and evening surveys kangaroos are resting in the peripheral shaded areas during the hottest part of the day and browsing on the more open areas during the morning, late afternoon and evening. A number of kangaroo carcasses were located during the survey suggesting wild dogs or dingoes are having some impact on the local population.

Subdivision design will need to incorporate a number of the key objectives of the Coffs Harbour Kangaroo Management Plan to ensure the welfare of both kangaroos and future residents (CHCC 2017).



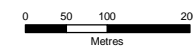
**Figure 4: Mapped koala habitat**

Keiley Hunter Urban Planner  
Newmans Road EA

- Koala (Bionet record)
- Tertiary koala habitat
- Secondary koala habitat
- Project area



Job number: PR2836  
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GDA 1994 MGA Zone 56  
Projection: Transverse Mercator  
Datum: GDA 1994  
Units: Meter

### 3.5 Bushfire threat analysis

It is anticipated that an Asset Protection Zone (APZ) will be required where proposed dwellings adjoin areas of consolidated dry sclerophyll forest, particularly along the northern boundary of the southern precinct. Holiday Coast Bushfire Solutions will determine the requisite distances based on the plant community type, structure and slope and target Bushfire Attack Level (BAL).

APZs will generally be excluded from extending in to remnant native vegetation. However, there may be circumstances where the Outer Protection Area (OPA) of an APZ will impinge in to proposed E3 zones.

### 3.6 Woolgoolga Lake Estuary Coastal Zone Management Plan

The Coastal Zone Management Plan (CZMP) recognises that new developments have the potential to reduce the quality of catchment runoff during and after the construction phase. It is important that controls are placed on this new development to ensure no negative net impact upon water quality. This includes stormwater management (treatment and detention) of a standard that will not impact on Poundyard Creek or the Woolgoolga Lake Estuary. Stormwater management and pollutant inputs from the catchment was the second highest ranked issue identified in the CZMP.

Water quality also has the potential to impact on a range of terrestrial and aquatic threatened fauna including some of the threatened entities identified in Table 3.

## 4 Discussion

Areas of ecological value that are proposed to be retained and zoned as E3 – Environmental Management are shown in Figure 5. Indicative wildlife linkages are also shown to demonstrate the major pathways for wildlife through the landscape both along Poundyard Creek and through the centre of the site using existing mature vegetation as a biolink.

The natural values of the southern precinct include scattered brushbox, turpentine and a few large diameter tallowwoods. There are no large diameter hollow-bearing trees associated with the site although some of the larger diameter trees are likely to become hollow in future decades. There are some fringes of wet sclerophyll forest mapped as secondary koala habitat along the northern boundary that link with riparian vegetation associated with Poundyard Creek. Some infill planting of this area would further consolidate this vegetation and enhance ecological buffering of the creek.

A large council owned water storage south-east of the southern precinct has a number of NSW BioNet threatened species records of wetland fauna.

The rest of the site is dominated by exotic grassland and invasive shrubs and trees including large areas of establishing wildling slash pine. There are opportunities to retain individual eucalypts and a larger patch of remnant vegetation (approximately 500 m<sup>2</sup>) of eucalypts located across the central portion of the site as a biolink. This patch of remnant vegetation could become a more passive community based area for the benefit of local residents.




The thin area of mapped secondary koala habitat along the northern boundary will be retained and rehabilitated under a VMP to better consolidate riparian vegetation associated with Poundyard Creek. Protection of this vegetated link is important given it is likely to act as a movement corridor for koalas across the landscape. There are also three historical koala records from this area in NSW BioNet.



**Figure 5: Proposed environmental zoning and indicative biolink**

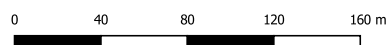
Keiley Hunter Urban Planner  
Newmans Road EA

*Note – there may be spatial misalignment between lot boundaries and underlying imagery*

-  Site boundary (Part lot 202 DP874273)
-  Proposed E3 Environmental management
-  50m biolink



Job number: PR3278  
Revision: 0  
Author: JLY  
Date: 28/08/2018



GDA 1994 MGA Zone 56  
Projection: Transverse Mercator  
Datum: GDA 1994  
Units: Meter

## 5 Recommendations

The following actions are recommended for the future development of the site:

1. Retain as much remnant native vegetation on-site as possible, including all mapped secondary koala habitat and ensure that proposed APZs do not impinge on these areas where possible (see Figure 5).
2. Conduct additional flora and fauna surveys to account for seasonal variations (and investigate presence of frogs), targeting species that have been determined to possibly occur on the site (Table 3).
3. Consider the development proposal's impact on eastern grey kangaroos, particularly within the context of the Council sports fields being developed to the north of the southern precinct which will increase the availability of food resources.
4. Where possible, link remnant vegetation of the site to other extant vegetation across the landscape to provide suitable movement pathways for wildlife. For the subject area this should include a network of E3 zoned areas in appropriate locations (Figure 5).
5. Retain individual eucalypts and a larger patch of remnant vegetation (approximately 500m<sup>2</sup>) of eucalypts as a biolink, establishing a connection between vegetation on the eastern and western sides of the subject land. The area can also be used for passive community based recreation for the benefit of local residents.
6. Prepare a Comprehensive Vegetation Management Plan (VMP) in accordance with CHCC's requirements to increase habitat value. The comprehensive VMP should give specific consideration to:
  - enhancement of proposed E3 zoned areas under CHCC's LEP
  - linking areas of remnant vegetation by identifying habitat linkages and 'gap filling' as required including the northern boundary of the southern precinct.
7. Conduct a detailed impact assessment that shows the extent of vegetation that will be removed / retained when the final concept design is developed and submitted under a Development Application to Council.
8. Given the subject lands proximity to Woolgoolga Lake and the Solitary Islands Marine Park, effective sediment and erosion controls should be employed during any future construction works. A management plan is recommended to prevent, mitigate and ameliorate the impacts of sediment runoff.
9. Implement the key objectives of the Coffs Harbour Kangaroo Management Plan to establish a strategic approach to maintain wild populations of eastern grey kangaroo while managing the social, economic and ecological impacts to ensure their welfare.
10. Implement a Storm Water Management Plan (including artificial wetlands if required) to reduce nutrients and sediments from reaching the surrounding areas. This is also recommended in the Woolgoolga Lake Estuary Coastal Zone Management Plan.

11. Limit the impact of APZs on remnant vegetation ensuring only Outer Protection Areas (OPA) impinge in to proposed E3 zoned areas
12. Utilise local native landscaping for future development (including any revegetation works), sourcing seed where possible from surrounding vegetation.

## 6 Conclusion

The southern precinct associated with the planning proposal has had a long history of agricultural use including extensive grazing. More recently these areas have been maintained as grassland, predominately exotic, by slashing. The southern precinct, if left undisturbed, would eventually revert to a mature slash pine forest as there are many 'wildings' currently dominating the site.

No large diameter hollow-bearing trees were located during the field assessment, suggesting that the site has been successively logged over the last 150 years. The majority of remnant vegetation is young eucalypt forest dominated by blackbutt and interspersed with other eucalypt species. This has limited the habitat value of the vegetation for a range of arboreal wildlife such as microbats, gliders, quolls, phascogales and large forest owls.

The current field assessment did not detect any threatened flora or fauna species on the site at the time of the survey. The author is unsure whether the spatial records are inaccurate or whether the individual plants have been collected (i.e. Southern swamp orchid), or perished as a result of grazing, slashing, clearing, fungal attack or drought.

The NSW Bionet records indicate that the site, and its surrounds, are utilised by a range of threatened fauna species on a seasonal basis. Further seasonal surveys for some fauna species are required.

The planning proposal will need to give consideration to the very large population of eastern grey kangaroos currently inhabiting the subject area and surrounds (including the proposed council sports fields). Based on estimates, the population currently numbers approximately 300 individuals which will be severely compromised by a large lot subdivision and formal sports fields.

This report recommends a biolink to connect linear remnants of vegetation across the broader landscape using riparian vegetation along Poundyard Creek as a focal point (Figure 5). The proposed re-zoning of the best consolidated patches of remnant vegetation under E3 – Environmental Management is important to consolidate the long term protection of habitat. This is one of the objectives under CHCC's Development Control Plan 2015 (E1.2 compensatory requirements) 'to protect and maintain important linkages between habitats'.



## References

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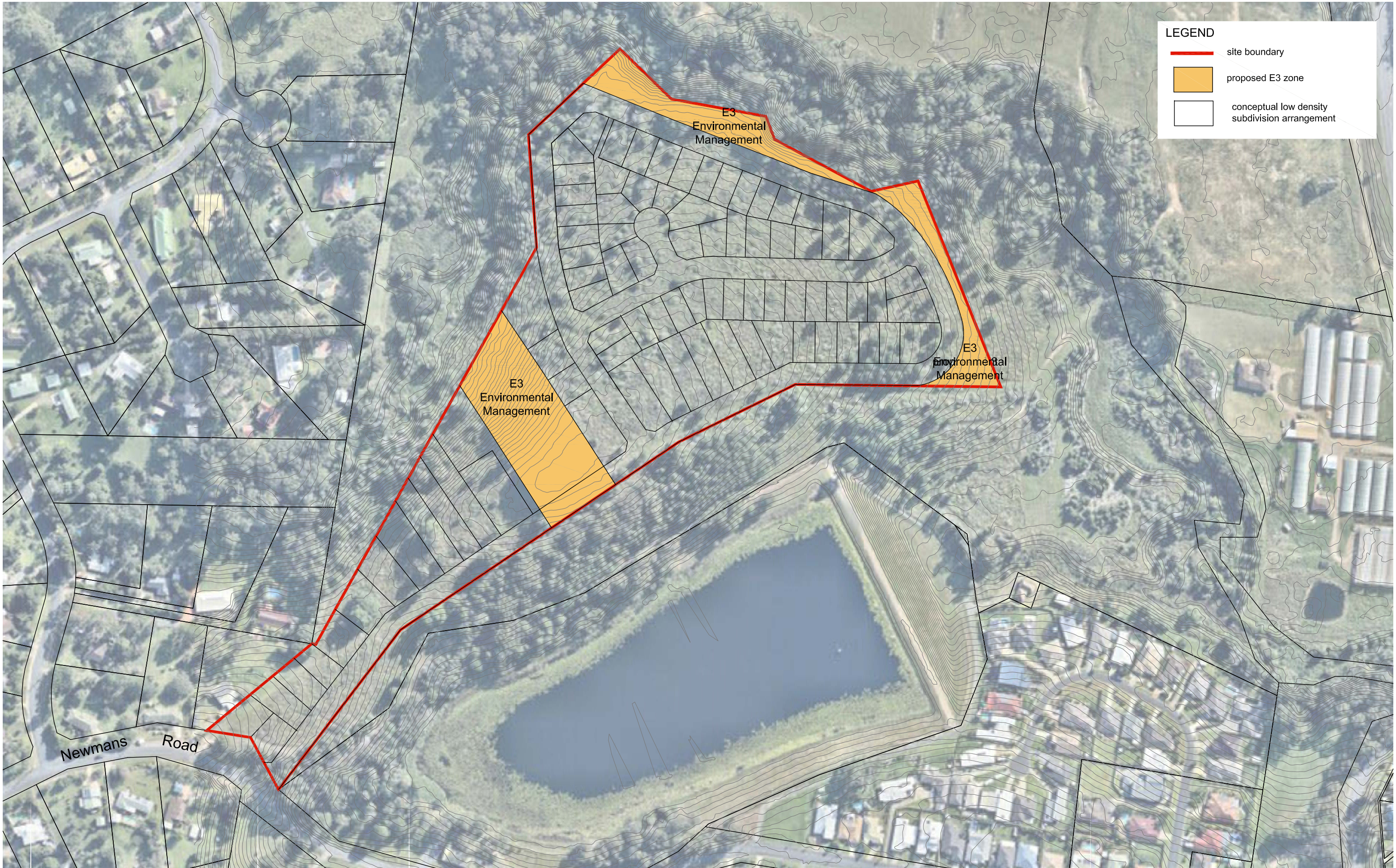
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
Office of Environment & Heritage 2012b, *Development of a Fine-scale Vegetation Map for the Coffs Harbour Local Government Area, Volume 2: Vegetation community Profiles*, NSW Office of Environment and Heritage, NSW Government on behalf of Coffs Harbour City Council and the Northern Rivers Catchment Management Authority

Office of Environment & Heritage, *Threatened species profile search*. Accessed 14 Oct 2016 <http://www.environment.nsw.gov.au/threatenedSpeciesApp/>

# Appendix 1 Preliminary concept design



**LEGEND**

-  site boundary
-  proposed E3 zone
-  conceptual low density subdivision arrangement

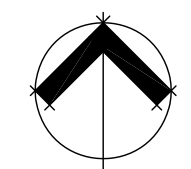
Use figured dimensions in preference to scales. Please notify the Landscape Architect before proceeding if any anomaly is found between this drawing and conditions on site. This drawing must not be relied upon for any purpose other than that for which it was prepared or by any person or corporation other than the referred client.

AMENDMENTS			
Issue	Date	Details	Initial
A	22.2.18	Client review	JA
B	11.5.18	amended for Asset Protection Zones	JA
C	11.5.18	amended as per DGB feedback	JA
D	3.7.18	E3 zone added	JA
E	11.9.18	planning proposal	JA

<b>PROJECT</b>
Bark Hut Road, Woolgoolga
<b>PLANNING PROPOSAL</b>
<b>CLIENT</b>
Keiley Hunter Urban Planner

<b>DRAWING</b>
Planning Proposal
Proposed Subdivision Layout Newmans Rd
<b>DRAWING NO.</b>
1730-06

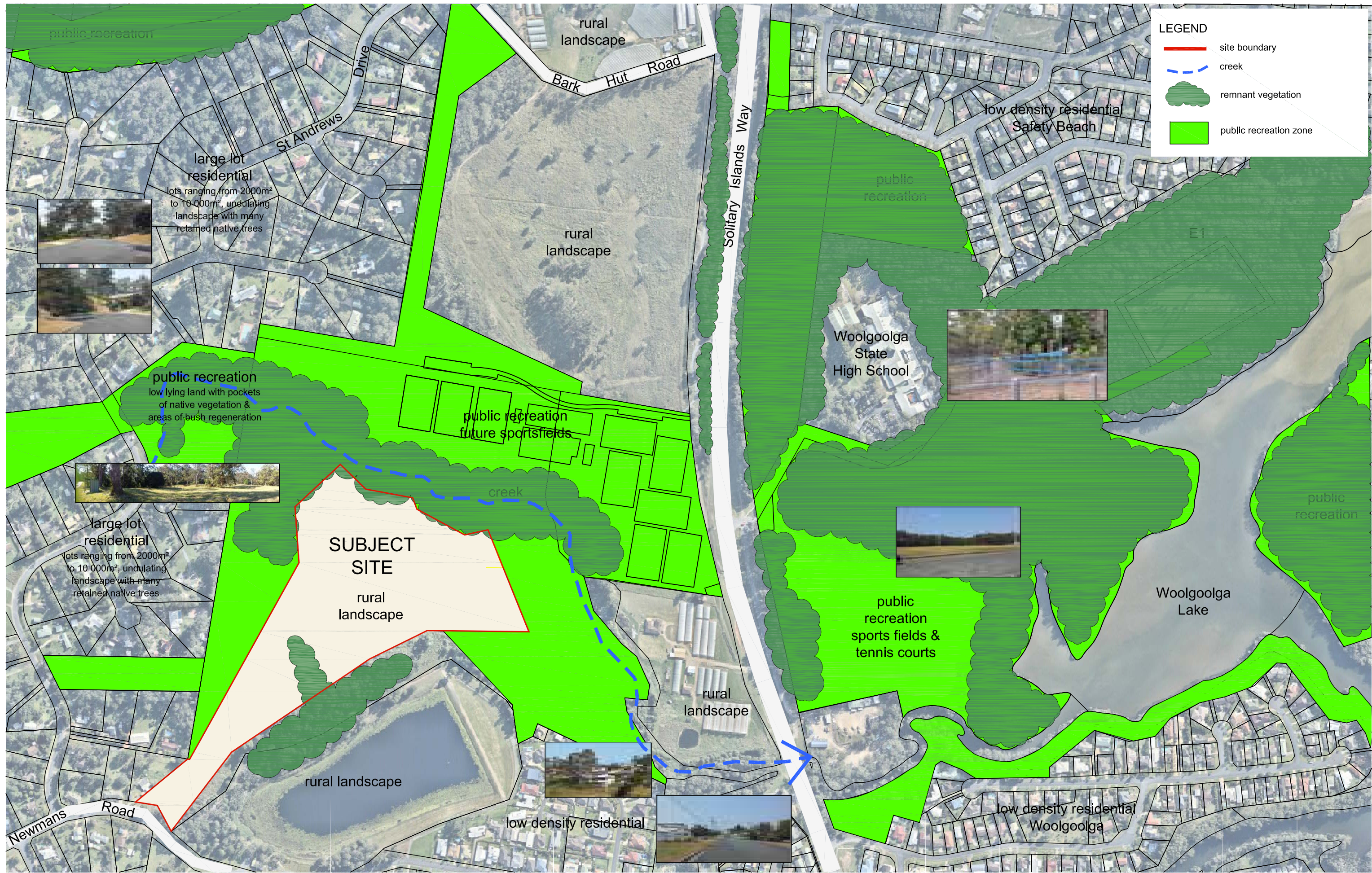
<b>DRAWN</b>	<b>ISSUE</b>
JA	E
<b>DATE</b>	
September 2018	



Jackie Amos Landscape Architect

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**LEGEND**

- site boundary
- - - creek
- remnant vegetation
- public recreation zone

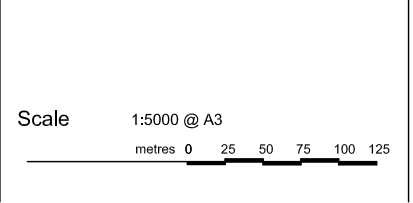
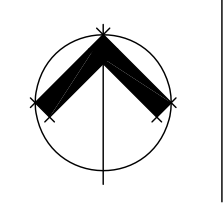
Use figured dimensions in preference to scales. Please notify the Landscape Architect before proceeding if any anomaly is found between this drawing and conditions on site. This drawing must not be relied upon for any purpose other than that for which it was prepared or by any person or corporation other than the referred client.

AMENDMENTS			
Issue	Date	Details	Initial
A	22.2.18	Client review	JA
B	11.9.18	planning proposal	JA

<b>PROJECT</b> Bark Hut Road, Woolgoolga <b>PLANNING PROPOSAL</b>
<b>CLIENT</b> Kelley Hunter Urban Planner

<b>DRAWING</b> Planning Proposal Site Context <b>DRAWING NO.</b> 1730-01
--

<b>DRAWN</b> JA	<b>ISSUE</b> B
<b>DATE</b> September 2018	



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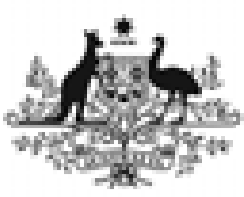
## Appendix 2 BioNet search

Class name	Family name	Scientific name	Common name	NSW Status	Comm Status
Frogs	Myobatrachidae	<i>Mixophyes iteratus</i>	Giant Barred Frog	E1,2	E
Birds	Ciconiidae	<i>Ephippiorhynchus asiaticus</i>	Black-necked Stork	E1	not listed
	Psittacidae	<i>Lathamus discolor</i>	Swift Parrot	E1,P,3	CE
	Ardeidae	<i>Ardea ibis</i>	Cattle Egret	not listed	C,J
	Apodidae	<i>Hirundapus caudacutus</i>	White-throated Needletail	not listed	C,J,K
	Anatidae	<i>Stictonetta naevosa</i>	Freckled Duck	V	not listed
	Columbidae	<i>Ptilinopus magnificus</i>	Wompoo Fruit-Dove	V	not listed
	Ardeidae	<i>Ixobrychus flavicollis</i>	Black Bittern	V	not listed
	Gruidae	<i>Grus rubicunda</i>	Brolga	V	not listed
	Jacanidae	<i>Irediparra gallinacea</i>	Comb-crested Jacana	V	not listed
	Neosittidae	<i>Daphoenositta chrysoptera</i>	Varied Sittella	V	not listed
Accipitridae	<i>Haliaeetus leucogaster</i>	White-bellied Sea-Eagle	V	C	
Cacatuidae	<i>Calyptorhynchus lathami</i>	Glossy Black-Cockatoo	V,2	not listed	
Accipitridae	<i>Pandion cristatus</i>	Eastern Osprey	V,3	not listed	
Strigidae	<i>Ninox strenua</i>	Powerful Owl	V,3	not listed	
Mammals	Dasyuridae	<i>Dasyurus maculatus</i>	Spotted-tailed Quoll	V	E
	Phascolarctidae	<i>Phascolarctos cinereus</i>	Koala	V	V
	Pteropodidae	<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox	V	V
	Vespertilionidae	<i>Kerivoula papuensis</i>	Golden-tipped Bat	V	not listed
Flora	Apocynaceae	<i>Marsdenia longiloba</i>	Slender Marsdenia	E1	V
	Orchidaceae	<i>Phaius australis</i>	Southern Swamp Orchid	E1,2	E
	Sapotaceae	<i>Niemeyera whitei</i>	Rusty Plum, Plum Boxwood	V	not listed
	Proteaceae	<i>Hicksbeachia pinnatifolia</i>	Red Boppel Nut	V	V
	Proteaceae	<i>Macadamia tetraphylla</i>	Rough-shelled Bush Nut	V	V

TSA: E1 Endangered, P Protected, V Vulnerable, 2 Category 2 sensitive species, 3 Category 3 sensitive species

EPBC: CE Critically endangered, E Endangered, V Vulnerable

## Appendix 3 EPBC protected matters search results



# EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected.

Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

Information is available about [Environment Assessments](#) and the EPBC Act including significance guidelines, forms and application process details.

Report created: 22/09/17 10:51:00

[Summary](#)

[Details](#)

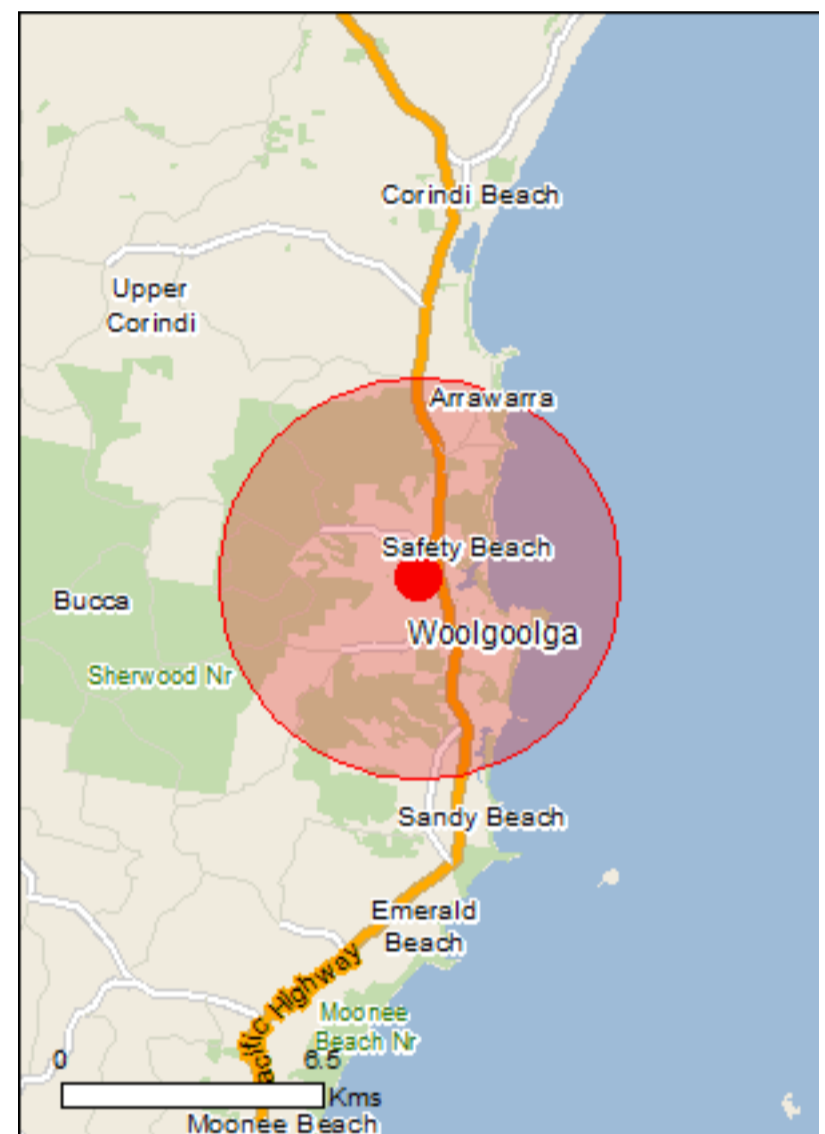
[Matters of NES](#)

[Other Matters Protected by the EPBC Act](#)

[Extra Information](#)

[Caveat](#)

[Acknowledgements](#)



This map may contain data which are ©Commonwealth of Australia (Geoscience Australia), ©PSMA 2010

[Coordinates](#)

Buffer: 5.0Km



# 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](#).

<a href="#">World Heritage Properties:</a>	None
<a href="#">National Heritage Places:</a>	None
<a href="#">Wetlands of International Importance:</a>	None
<a href="#">Great Barrier Reef Marine Park:</a>	None
<a href="#">Commonwealth Marine Area:</a>	None
<a href="#">Listed Threatened Ecological Communities:</a>	3
<a href="#">Listed Threatened Species:</a>	73
<a href="#">Listed Migratory Species:</a>	51

## 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. Information on the new heritage laws can be found at <http://www.environment.gov.au/heritage>

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.

<a href="#">Commonwealth Land:</a>	1
<a href="#">Commonwealth Heritage Places:</a>	None
<a href="#">Listed Marine Species:</a>	89
<a href="#">Whales and Other Cetaceans:</a>	12
<a href="#">Critical Habitats:</a>	None
<a href="#">Commonwealth Reserves Terrestrial:</a>	None
<a href="#">Commonwealth Reserves Marine:</a>	None

## Extra Information

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

<a href="#">State and Territory Reserves:</a>	5
<a href="#">Regional Forest Agreements:</a>	1
<a href="#">Invasive Species:</a>	41
<a href="#">Nationally Important Wetlands:</a>	None
<a href="#">Key Ecological Features (Marine)</a>	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
<a href="#">Littoral Rainforest and Coastal Vine Thickets of Eastern Australia</a>	Critically Endangered	Community likely to occur within area
<a href="#">Lowland Rainforest of Subtropical Australia</a>	Critically Endangered	Community likely to occur within area
<a href="#">Subtropical and Temperate Coastal Saltmarsh</a>	Vulnerable	Community likely to occur within area

### Listed Threatened Species

[\[ Resource Information \]](#)

Name	Status	Type of Presence
<b>Birds</b>		
<a href="#">Anthochaera phrygia</a> Regent Honeyeater [82338]	Critically Endangered	Species or species habitat known to occur within area
<a href="#">Botaurus poiciloptilus</a> Australasian Bittern [1001]	Endangered	Species or species habitat likely to occur within area
<a href="#">Calidris canutus</a> Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area
<a href="#">Calidris ferruginea</a> Curlew Sandpiper [856]	Critically Endangered	Species or species habitat likely to occur within area
<a href="#">Dasyornis brachypterus</a> Eastern Bristlebird [533]	Endangered	Species or species habitat may occur within area
<a href="#">Diomedea antipodensis</a> Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
<a href="#">Diomedea antipodensis gibsoni</a> Gibson's Albatross [82270]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
<a href="#">Diomedea epomophora</a> Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
<a href="#">Diomedea exulans</a> Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
<a href="#">Diomedea sanfordi</a> Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely

Name	Status	Type of Presence
<a href="#">Erythrotriorchis radiatus</a> Red Goshawk [942]	Vulnerable	to occur within area Species or species habitat likely to occur within area
<a href="#">Fregetta grallaria grallaria</a> White-bellied Storm-Petrel (Tasman Sea), White-bellied Storm-Petrel (Australasian) [64438]	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Lathamus discolor</a> Swift Parrot [744]	Critically Endangered	Species or species habitat likely to occur within area
<a href="#">Limosa lapponica baueri</a> Bar-tailed Godwit (baueri), Western Alaskan Bar-tailed Godwit [86380]	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Limosa lapponica menzbieri</a> Northern Siberian Bar-tailed Godwit, Bar-tailed Godwit (menzbieri) [86432]	Critically Endangered	Species or species habitat may occur within area
<a href="#">Macronectes giganteus</a> Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
<a href="#">Macronectes halli</a> Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area
<a href="#">Numenius madagascariensis</a> Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
<a href="#">Pachyptila turtur subantarctica</a> Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat known to occur within area
<a href="#">Phoebetria fusca</a> Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area
<a href="#">Pterodroma leucoptera leucoptera</a> Gould's Petrel, Australian Gould's Petrel [26033]	Endangered	Species or species habitat may occur within area
<a href="#">Pterodroma neglecta neglecta</a> Kermadec Petrel (western) [64450]	Vulnerable	Foraging, feeding or related behaviour may occur within area
<a href="#">Rostratula australis</a> Australian Painted Snipe [77037]	Endangered	Species or species habitat may occur within area
<a href="#">Thalassarche bulleri</a> Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Species or species habitat may occur within area
<a href="#">Thalassarche bulleri platei</a> Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Species or species habitat may occur within area
<a href="#">Thalassarche cauta cauta</a> Shy Albatross, Tasmanian Shy Albatross [82345]	Vulnerable	Species or species habitat may occur within area
<a href="#">Thalassarche cauta steadi</a> White-capped Albatross [82344]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
<a href="#">Thalassarche eremita</a> Chatham Albatross [64457]	Endangered	Species or species habitat may occur within area

Name	Status	Type of Presence
<a href="#">Thalassarche impavida</a> Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area
<a href="#">Thalassarche melanophris</a> Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area
<a href="#">Thalassarche salvini</a> Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
<a href="#">Turnix melanogaster</a> Black-breasted Button-quail [923]	Vulnerable	Species or species habitat may occur within area
<b>Fish</b>		
<a href="#">Epinephelus daemeli</a> Black Rockcod, Black Cod, Saddled Rockcod [68449]	Vulnerable	Species or species habitat likely to occur within area
<b>Frogs</b>		
<a href="#">Litoria aurea</a> Green and Golden Bell Frog [1870]	Vulnerable	Species or species habitat may occur within area
<a href="#">Litoria olongburensis</a> Wallum Sedge Frog [1821]	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Mixophyes iteratus</a> Giant Barred Frog, Southern Barred Frog [1944]	Endangered	Species or species habitat known to occur within area
<b>Insects</b>		
<a href="#">Argynnis hyperbius inconstans</a> Australian Fritillary [88056]	Critically Endangered	Species or species habitat may occur within area
<a href="#">Phyllodes imperialis smithersi</a> Pink Underwing Moth [86084]	Endangered	Species or species habitat may occur within area
<b>Mammals</b>		
<a href="#">Balaenoptera musculus</a> Blue Whale [36]	Endangered	Species or species habitat may occur within area
<a href="#">Chalinolobus dwyeri</a> Large-eared Pied Bat, Large Pied Bat [183]	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Dasyurus maculatus maculatus (SE mainland population)</a> Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat known to occur within area
<a href="#">Eubalaena australis</a> Southern Right Whale [40]	Endangered	Species or species habitat likely to occur within area
<a href="#">Megaptera novaeangliae</a> Humpback Whale [38]	Vulnerable	Species or species habitat known to occur within area
<a href="#">Petauroides volans</a> Greater Glider [254]	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Petrogale penicillata</a> Brush-tailed Rock-wallaby [225]	Vulnerable	Species or species habitat may occur within area

Name	Status	Type of Presence
<a href="#">Phascolarctos cinereus (combined populations of Qld, NSW and the ACT)</a>		
Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Vulnerable	Species or species habitat known to occur within area
<a href="#">Potorous tridactylus tridactylus</a>		
Long-nosed Potoroo (SE mainland) [66645]	Vulnerable	Species or species habitat may occur within area
<a href="#">Pseudomys novaehollandiae</a>		
New Holland Mouse, Pookila [96]	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Pteropus poliocephalus</a>		
Grey-headed Flying-fox [186]	Vulnerable	Roosting known to occur within area
<b>Plants</b>		
<a href="#">Allocasuarina defungens</a>		
Dwarf Heath Casuarina [21924]	Endangered	Species or species habitat known to occur within area
<a href="#">Allocasuarina thalassoscopica</a>		
[21927]	Endangered	Species or species habitat known to occur within area
<a href="#">Arthraxon hispidus</a>		
Hairy-joint Grass [9338]	Vulnerable	Species or species habitat may occur within area
<a href="#">Boronia umbellata</a>		
Orara Boronia [56301]	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Cryptostylis hunteriana</a>		
Leafless Tongue-orchid [19533]	Vulnerable	Species or species habitat may occur within area
<a href="#">Cynanchum elegans</a>		
White-flowered Wax Plant [12533]	Endangered	Species or species habitat likely to occur within area
<a href="#">Hicksbeachia pinnatifolia</a>		
Monkey Nut, Bopple Nut, Red Bopple, Red Bopple Nut, Red Nut, Beef Nut, Red Apple Nut, Red Boppel Nut, Ivory Silky Oak [21189]	Vulnerable	Species or species habitat known to occur within area
<a href="#">Macadamia integrifolia</a>		
Macadamia Nut, Queensland Nut Tree, Smooth-shelled Macadamia, Bush Nut, Nut Oak [7326]	Vulnerable	Species or species habitat may occur within area
<a href="#">Macadamia tetraphylla</a>		
Rough-shelled Bush Nut, Macadamia Nut, Rough-shelled Macadamia, Rough-leaved Queensland Nut [6581]	Vulnerable	Species or species habitat known to occur within area
<a href="#">Marsdenia longiloba</a>		
Clear Milkvine [2794]	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Parsonsia dorrigoensis</a>		
Milky Silkpod [64684]	Endangered	Species or species habitat likely to occur within area
<a href="#">Phaius australis</a>		
Lesser Swamp-orchid [5872]	Endangered	Species or species habitat known to occur within area
<a href="#">Samadera sp. Moonee Creek (J.King s.n. Nov. 1949)</a>		
[86885]	Endangered	Species or species habitat likely to occur within area
<a href="#">Thesium australe</a>		
Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat known to occur within area

Name	Status	Type of Presence
<a href="#">Tylophora woollsii</a> [20503]	Endangered	Species or species habitat likely to occur within area
<a href="#">Zieria prostrata</a> Headland Zieria [56782]	Endangered	Species or species habitat known to occur within area
<b>Reptiles</b>		
<a href="#">Caretta caretta</a> Loggerhead Turtle [1763]	Endangered	Breeding known to occur within area
<a href="#">Chelonia mydas</a> Green Turtle [1765]	Vulnerable	Species or species habitat known to occur within area
<a href="#">Dermochelys coriacea</a> Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area
<a href="#">Eretmochelys imbricata</a> Hawksbill Turtle [1766]	Vulnerable	Species or species habitat known to occur within area
<a href="#">Natator depressus</a> Flatback Turtle [59257]	Vulnerable	Breeding likely to occur within area
<b>Sharks</b>		
<a href="#">Carcharias taurus (east coast population)</a> Grey Nurse Shark (east coast population) [68751]	Critically Endangered	Species or species habitat likely to occur within area
<a href="#">Carcharodon carcharias</a> White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat known to occur within area
<a href="#">Rhincodon typus</a> Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area
<b>Listed Migratory Species</b>		<b>[ Resource Information ]</b>
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
<b>Migratory Marine Birds</b>		
<a href="#">Anous stolidus</a> Common Noddy [825]		Species or species habitat likely to occur within area
<a href="#">Apus pacificus</a> Fork-tailed Swift [678]		Species or species habitat likely to occur within area
<a href="#">Ardenna carneipes</a> Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Foraging, feeding or related behaviour likely to occur within area
<a href="#">Calonectris leucomelas</a> Streaked Shearwater [1077]		Species or species habitat may occur within area
<a href="#">Diomedea epomophora</a> Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
<a href="#">Diomedea exulans</a> Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
<a href="#">Fregata ariel</a> Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat likely to occur within area

Name	Threatened	Type of Presence
<a href="#">Fregata minor</a> Great Frigatebird, Greater Frigatebird [1013]		Species or species habitat likely to occur within area
<a href="#">Macronectes giganteus</a> Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
<a href="#">Macronectes halli</a> Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area
<a href="#">Phoebastria fusca</a> Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area
<a href="#">Sternula albifrons</a> Little Tern [82849]		Species or species habitat may occur within area
<a href="#">Thalassarche bulleri</a> Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Species or species habitat may occur within area
<a href="#">Thalassarche cauta</a> Tasmanian Shy Albatross [89224]	Vulnerable*	Species or species habitat may occur within area
<a href="#">Thalassarche melanophris</a> Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area
<b>Migratory Marine Species</b>		
<a href="#">Balaena glacialis australis</a> Southern Right Whale [75529]	Endangered*	Species or species habitat likely to occur within area
<a href="#">Balaenoptera edeni</a> Bryde's Whale [35]		Species or species habitat may occur within area
<a href="#">Balaenoptera musculus</a> Blue Whale [36]	Endangered	Species or species habitat may occur within area
<a href="#">Carcharodon carcharias</a> White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat known to occur within area
<a href="#">Caretta caretta</a> Loggerhead Turtle [1763]	Endangered	Breeding known to occur within area
<a href="#">Chelonia mydas</a> Green Turtle [1765]	Vulnerable	Species or species habitat known to occur within area
<a href="#">Dermochelys coriacea</a> Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area
<a href="#">Dugong dugon</a> Dugong [28]		Species or species habitat may occur within area
<a href="#">Eretmochelys imbricata</a> Hawksbill Turtle [1766]	Vulnerable	Species or species habitat known to occur within area
<a href="#">Lamna nasus</a> Porbeagle, Mackerel Shark [83288]		Species or species habitat may occur within area
<a href="#">Manta alfredi</a> Reef Manta Ray, Coastal Manta Ray, Inshore		Species or species

Name	Threatened	Type of Presence
Manta Ray, Prince Alfred's Ray, Resident Manta Ray [84994] <a href="#">Manta birostris</a>		habitat known to occur within area
Giant Manta Ray, Chevron Manta Ray, Pacific Manta Ray, Pelagic Manta Ray, Oceanic Manta Ray [84995] <a href="#">Megaptera novaeangliae</a>		Species or species habitat may occur within area
Humpback Whale [38]	Vulnerable	Species or species habitat known to occur within area
<a href="#">Natator depressus</a> Flatback Turtle [59257]	Vulnerable	Breeding likely to occur within area
<a href="#">Orcinus orca</a> Killer Whale, Orca [46]		Species or species habitat may occur within area
<a href="#">Rhincodon typus</a> Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area
<a href="#">Sousa chinensis</a> Indo-Pacific Humpback Dolphin [50]		Species or species habitat likely to occur within area
<b>Migratory Terrestrial Species</b>		
<a href="#">Cuculus optatus</a> Oriental Cuckoo, Horsfield's Cuckoo [86651]		Species or species habitat may occur within area
<a href="#">Hirundapus caudacutus</a> White-throated Needletail [682]		Species or species habitat known to occur within area
<a href="#">Monarcha melanopsis</a> Black-faced Monarch [609]		Species or species habitat known to occur within area
<a href="#">Monarcha trivirgatus</a> Spectacled Monarch [610]		Species or species habitat known to occur within area
<a href="#">Myiagra cyanoleuca</a> Satin Flycatcher [612]		Breeding known to occur within area
<a href="#">Rhipidura rufifrons</a> Rufous Fantail [592]		Species or species habitat known to occur within area
<b>Migratory Wetlands Species</b>		
<a href="#">Actitis hypoleucos</a> Common Sandpiper [59309]		Species or species habitat known to occur within area
<a href="#">Calidris acuminata</a> Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
<a href="#">Calidris canutus</a> Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area
<a href="#">Calidris ferruginea</a> Curlew Sandpiper [856]	Critically Endangered	Species or species habitat likely to occur within area
<a href="#">Calidris melanotos</a> Pectoral Sandpiper [858]		Species or species habitat may occur within area
<a href="#">Gallinago hardwickii</a> Latham's Snipe, Japanese Snipe [863]		Foraging, feeding or related behaviour may

Name	Threatened	Type of Presence
<a href="#">Gallinago megala</a> Swinhoe's Snipe [864]		occur within area  Foraging, feeding or related behaviour likely to occur within area
<a href="#">Gallinago stenura</a> Pin-tailed Snipe [841]		Foraging, feeding or related behaviour likely to occur within area
<a href="#">Limosa lapponica</a> Bar-tailed Godwit [844]		Species or species habitat known to occur within area
<a href="#">Numenius madagascariensis</a> Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
<a href="#">Numenius minutus</a> Little Curlew, Little Whimbrel [848]		Foraging, feeding or related behaviour likely to occur within area
<a href="#">Pandion haliaetus</a> Osprey [952]		Breeding known to occur within area
<a href="#">Tringa nebularia</a> Common Greenshank, Greenshank [832]		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 - Australian Telecommunications Commission

### 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
<b>Birds</b>		
<a href="#">Actitis hypoleucos</a> Common Sandpiper [59309]		Species or species habitat known to occur within area
<a href="#">Anous stolidus</a> Common Noddy [825]		Species or species habitat likely to occur within area
<a href="#">Apus pacificus</a> Fork-tailed Swift [678]		Species or species habitat likely to occur within area
<a href="#">Ardea alba</a> Great Egret, White Egret [59541]		Species or species habitat known to occur within area
<a href="#">Ardea ibis</a> Cattle Egret [59542]		Species or species habitat may occur within area
<a href="#">Calidris acuminata</a> Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
<a href="#">Calidris canutus</a> Red Knot, Knot [855]	Endangered	Species or species



Name	Threatened	Type of Presence
<a href="#">Calidris ferruginea</a> Curlew Sandpiper [856]	Critically Endangered	habitat known to occur within area Species or species habitat likely to occur within area
<a href="#">Calidris melanotos</a> Pectoral Sandpiper [858]		Species or species habitat may occur within area
<a href="#">Calonectris leucomelas</a> Streaked Shearwater [1077]		Species or species habitat may occur within area
<a href="#">Catharacta skua</a> Great Skua [59472]		Species or species habitat may occur within area
<a href="#">Cuculus saturatus</a> Oriental Cuckoo, Himalayan Cuckoo [710]		Species or species habitat may occur within area
<a href="#">Diomedea antipodensis</a> Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
<a href="#">Diomedea epomophora</a> Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
<a href="#">Diomedea exulans</a> Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
<a href="#">Diomedea gibsoni</a> Gibson's Albatross [64466]	Vulnerable*	Foraging, feeding or related behaviour likely to occur within area
<a href="#">Diomedea sanfordi</a> Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
<a href="#">Fregata ariel</a> Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat likely to occur within area
<a href="#">Fregata minor</a> Great Frigatebird, Greater Frigatebird [1013]		Species or species habitat likely to occur within area
<a href="#">Gallinago hardwickii</a> Latham's Snipe, Japanese Snipe [863]		Foraging, feeding or related behaviour may occur within area
<a href="#">Gallinago megala</a> Swinhoe's Snipe [864]		Foraging, feeding or related behaviour likely to occur within area
<a href="#">Gallinago stenura</a> Pin-tailed Snipe [841]		Foraging, feeding or related behaviour likely to occur within area
<a href="#">Haliaeetus leucogaster</a> White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area
<a href="#">Hirundapus caudacutus</a> White-throated Needletail [682]		Species or species habitat known to occur within area
<a href="#">Lathamus discolor</a> Swift Parrot [744]	Critically Endangered	Species or species habitat likely to occur

Name	Threatened	Type of Presence within area
<a href="#">Limosa lapponica</a> Bar-tailed Godwit [844]		Species or species habitat known to occur within area
<a href="#">Macronectes giganteus</a> Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
<a href="#">Macronectes halli</a> Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area
<a href="#">Merops ornatus</a> Rainbow Bee-eater [670]		Species or species habitat may occur within area
<a href="#">Monarcha melanopsis</a> Black-faced Monarch [609]		Species or species habitat known to occur within area
<a href="#">Monarcha trivirgatus</a> Spectacled Monarch [610]		Species or species habitat known to occur within area
<a href="#">Myiagra cyanoleuca</a> Satin Flycatcher [612]		Breeding known to occur within area
<a href="#">Numenius madagascariensis</a> Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
<a href="#">Numenius minutus</a> Little Curlew, Little Whimbrel [848]		Foraging, feeding or related behaviour likely to occur within area
<a href="#">Pachyptila turtur</a> Fairy Prion [1066]		Species or species habitat known to occur within area
<a href="#">Pandion haliaetus</a> Osprey [952]		Breeding known to occur within area
<a href="#">Phoebastria fusca</a> Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area
<a href="#">Puffinus carneipes</a> Flesh-footed Shearwater, Fleshy-footed Shearwater [1043]		Foraging, feeding or related behaviour likely to occur within area
<a href="#">Rhipidura rufifrons</a> Rufous Fantail [592]		Species or species habitat known to occur within area
<a href="#">Rostratula benghalensis (sensu lato)</a> Painted Snipe [889]	Endangered*	Species or species habitat may occur within area
<a href="#">Sterna albifrons</a> Little Tern [813]		Species or species habitat may occur within area
<a href="#">Thalassarche bulleri</a> Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Species or species habitat may occur within area
<a href="#">Thalassarche cauta</a> Tasmanian Shy Albatross [89224]	Vulnerable*	Species or species habitat may occur within area
<a href="#">Thalassarche eremita</a> Chatham Albatross [64457]	Endangered	Species or species

Name	Threatened	Type of Presence
<a href="#">Thalassarche impavida</a> Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	habitat may occur within area Species or species habitat may occur within area
<a href="#">Thalassarche melanophris</a> Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area
<a href="#">Thalassarche salvini</a> Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
<a href="#">Thalassarche sp. nov.</a> Pacific Albatross [66511]	Vulnerable*	Species or species habitat may occur within area
<a href="#">Thalassarche steadi</a> White-capped Albatross [64462]	Vulnerable*	Foraging, feeding or related behaviour likely to occur within area
<a href="#">Tringa nebularia</a> Common Greenshank, Greenshank [832]		Species or species habitat may occur within area
<b>Fish</b>		
<a href="#">Acentronura tentaculata</a> Shortpouch Pygmy Pipehorse [66187]		Species or species habitat may occur within area
<a href="#">Campichthys tryoni</a> Tryon's Pipefish [66193]		Species or species habitat may occur within area
<a href="#">Corythoichthys amplexus</a> Fijian Banded Pipefish, Brown-banded Pipefish [66199]		Species or species habitat may occur within area
<a href="#">Corythoichthys ocellatus</a> Orange-spotted Pipefish, Ocellated Pipefish [66203]		Species or species habitat may occur within area
<a href="#">Festucalex cinctus</a> Girdled Pipefish [66214]		Species or species habitat may occur within area
<a href="#">Filicampus tigris</a> Tiger Pipefish [66217]		Species or species habitat may occur within area
<a href="#">Halicampus grayi</a> Mud Pipefish, Gray's Pipefish [66221]		Species or species habitat may occur within area
<a href="#">Hippichthys cyanospilos</a> Blue-speckled Pipefish, Blue-spotted Pipefish [66228]		Species or species habitat may occur within area
<a href="#">Hippichthys heptagonus</a> Madura Pipefish, Reticulated Freshwater Pipefish [66229]		Species or species habitat may occur within area
<a href="#">Hippichthys penicillus</a> Beady Pipefish, Steep-nosed Pipefish [66231]		Species or species habitat may occur within area
<a href="#">Hippocampus kelloggi</a> Kellogg's Seahorse, Great Seahorse [66723]		Species or species habitat may occur within area
<a href="#">Hippocampus kuda</a> Spotted Seahorse, Yellow Seahorse [66237]		Species or species

Name	Threatened	Type of Presence
<a href="#">Hippocampus planifrons</a> Flat-face Seahorse [66238]		habitat may occur within area  Species or species habitat may occur within area
<a href="#">Hippocampus trimaculatus</a> Three-spot Seahorse, Low-crowned Seahorse, Flat-faced Seahorse [66720]		Species or species habitat may occur within area
<a href="#">Hippocampus whitei</a> White's Seahorse, Crowned Seahorse, Sydney Seahorse [66240]		Species or species habitat may occur within area
<a href="#">Lissocampus runa</a> Javelin Pipefish [66251]		Species or species habitat may occur within area
<a href="#">Maroubra perserrata</a> Sawtooth Pipefish [66252]		Species or species habitat may occur within area
<a href="#">Micrognathus andersonii</a> Anderson's Pipefish, Shortnose Pipefish [66253]		Species or species habitat may occur within area
<a href="#">Micrognathus brevirostris</a> thorntail Pipefish, Thorn-tailed Pipefish [66254]		Species or species habitat may occur within area
<a href="#">Microphis manadensis</a> Manado Pipefish, Manado River Pipefish [66258]		Species or species habitat may occur within area
<a href="#">Solegnathus dunckeri</a> Duncker's Pipehorse [66271]		Species or species habitat may occur within area
<a href="#">Solegnathus hardwickii</a> Pallid Pipehorse, Hardwick's Pipehorse [66272]		Species or species habitat may occur within area
<a href="#">Solegnathus spinosissimus</a> Spiny Pipehorse, Australian Spiny Pipehorse [66275]		Species or species habitat may occur within area
<a href="#">Solenostomus cyanopterus</a> Robust Ghostpipefish, Blue-finned Ghost Pipefish, [66183]		Species or species habitat may occur within area
<a href="#">Solenostomus paegnius</a> Rough-snout Ghost Pipefish [68425]		Species or species habitat may occur within area
<a href="#">Solenostomus paradoxus</a> Ornate Ghostpipefish, Harlequin Ghost Pipefish, Ornate Ghost Pipefish [66184]		Species or species habitat may occur within area
<a href="#">Stigmatopora nigra</a> Widebody Pipefish, Wide-bodied Pipefish, Black Pipefish [66277]		Species or species habitat may occur within area
<a href="#">Syngnathoides biaculeatus</a> Double-end Pipehorse, Double-ended Pipehorse, Alligator Pipefish [66279]		Species or species habitat may occur within area
<a href="#">Trachyrhamphus bicoarctatus</a> Bentstick Pipefish, Bend Stick Pipefish, Short-tailed Pipefish [66280]		Species or species habitat may occur within area
<a href="#">Urocampus carinirostris</a> Hairy Pipefish [66282]		Species or species habitat may occur within

Name	Threatened	Type of Presence area
<a href="#">Vanacampus margaritifer</a> Mother-of-pearl Pipefish [66283]		Species or species habitat may occur within area
<b>Mammals</b>		
<a href="#">Dugong dugon</a> Dugong [28]		Species or species habitat may occur within area
<b>Reptiles</b>		
<a href="#">Caretta caretta</a> Loggerhead Turtle [1763]	Endangered	Breeding known to occur within area
<a href="#">Chelonia mydas</a> Green Turtle [1765]	Vulnerable	Species or species habitat known to occur within area
<a href="#">Dermochelys coriacea</a> Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area
<a href="#">Eretmochelys imbricata</a> Hawksbill Turtle [1766]	Vulnerable	Species or species habitat known to occur within area
<a href="#">Hydrophis elegans</a> Elegant Seasnake [1104]		Species or species habitat may occur within area
<a href="#">Natator depressus</a> Flatback Turtle [59257]	Vulnerable	Breeding likely to occur within area
<a href="#">Pelamis platurus</a> Yellow-bellied Seasnake [1091]		Species or species habitat may occur within area
<b>Whales and other Cetaceans</b>		<b>[ Resource Information ]</b>
Name	Status	Type of Presence
<b>Mammals</b>		
<a href="#">Balaenoptera acutorostrata</a> Minke Whale [33]		Species or species habitat may occur within area
<a href="#">Balaenoptera edeni</a> Bryde's Whale [35]		Species or species habitat may occur within area
<a href="#">Balaenoptera musculus</a> Blue Whale [36]	Endangered	Species or species habitat may occur within area
<a href="#">Delphinus delphis</a> Common Dophin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area
<a href="#">Eubalaena australis</a> Southern Right Whale [40]	Endangered	Species or species habitat likely to occur within area
<a href="#">Grampus griseus</a> Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area
<a href="#">Megaptera novaeangliae</a> Humpback Whale [38]	Vulnerable	Species or species habitat known to occur within area
<a href="#">Orcinus orca</a> Killer Whale, Orca [46]		Species or species habitat may occur within area

Name	Status	Type of Presence
<a href="#">Sousa chinensis</a> Indo-Pacific Humpback Dolphin [50]		Species or species habitat likely to occur within area
<a href="#">Stenella attenuata</a> Spotted Dolphin, Pantropical Spotted Dolphin [51]		Species or species habitat may occur within area
<a href="#">Tursiops aduncus</a> Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin [68418]		Species or species habitat likely to occur within area
<a href="#">Tursiops truncatus s. str.</a> Bottlenose Dolphin [68417]		Species or species habitat may occur within area

## Extra Information

State and Territory Reserves	[ Resource Information ]
Name	State
Coffs Coast	NSW
Forestry Management Areas in Coffs Harbour	NSW
Garby	NSW
Sherwood	NSW
UNE Special Management Zone No1	NSW

Regional Forest Agreements	[ Resource Information ]
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Note that all areas with completed RFAs have been included.

Name	State
<a href="#">North East NSW RFA</a>	New South Wales

Invasive Species	[ Resource Information ]
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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 Resources Audit, 2001.

Name	Status	Type of Presence
<b>Birds</b>		
<i>Acridotheres tristis</i> Common Myna, Indian Myna [387]		Species or species habitat likely to occur within area
<i>Anas platyrhynchos</i> Mallard [974]		Species or species habitat likely to occur within area
<i>Carduelis carduelis</i> European Goldfinch [403]		Species or species habitat likely to occur within area
<i>Columba livia</i> Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
<i>Lonchura punctulata</i> Nutmeg Mannikin [399]		Species or species habitat likely to occur within area
<i>Passer domesticus</i> House Sparrow [405]		Species or species habitat likely to occur within area

Name	Status	Type of Presence
Pycnonotus jocosus Red-whiskered Bulbul [631]		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
<b>Frogs</b>		
Rhinella marina Cane Toad [83218]		Species or species habitat likely to occur within area
<b>Mammals</b>		
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
Feral deer Feral deer species in Australia [85733]		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 norvegicus Brown Rat, Norway Rat [83]		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
<b>Plants</b>		
Alternanthera philoxeroides Alligator Weed [11620]		Species or species habitat likely to occur within area
Anredera cordifolia Madeira Vine, Jalap, Lamb's-tail, Mignonette Vine,		Species or species

Name	Status	Type of Presence
Anredera, Gulf Madeiravine, Heartleaf Madeiravine, Potato Vine [2643] <i>Asparagus aethiopicus</i>		habitat likely to occur within area
Asparagus Fern, Ground Asparagus, Basket Fern, Sprengi's Fern, Bushy Asparagus, Emerald Asparagus [62425] <i>Asparagus plumosus</i>		Species or species habitat likely to occur within area
Climbing Asparagus-fern [48993]		Species or species habitat likely to occur within area
<i>Cabomba caroliniana</i> Cabomba, Fanwort, Carolina Watershield, Fish Grass, Washington Grass, Watershield, Carolina Fanwort, Common Cabomba [5171] <i>Chrysanthemoides monilifera</i>		Species or species habitat likely to occur within area
Bitou Bush, Boneseed [18983]		Species or species habitat likely to occur within area
<i>Chrysanthemoides monilifera</i> subsp. <i>rotundata</i> Bitou Bush [16332]		Species or species habitat likely to occur within area
<i>Eichhornia crassipes</i> Water Hyacinth, Water Orchid, Nile Lily [13466]		Species or species habitat likely to occur within area
<i>Genista</i> sp. X <i>Genista monspessulana</i> Broom [67538]		Species or species habitat may occur within area
<i>Lantana camara</i> Lantana, Common Lantana, Kamara Lantana, Large-leaf Lantana, Pink Flowered Lantana, Red Flowered Lantana, Red-Flowered Sage, White Sage, Wild Sage [10892] <i>Pinus radiata</i>		Species or species habitat likely to occur within area
Radiata Pine Monterey Pine, Insignis Pine, Wilding Pine [20780]		Species or species habitat may occur within area
<i>Protasparagus densiflorus</i> Asparagus Fern, Plume Asparagus [5015]		Species or species habitat likely to occur within area
<i>Protasparagus plumosus</i> Climbing Asparagus-fern, Ferny Asparagus [11747]		Species or species habitat likely to occur within area
<i>Rubus fruticosus</i> aggregate Blackberry, European Blackberry [68406]		Species or species habitat likely to occur within area
<i>Sagittaria platyphylla</i> Delta Arrowhead, Arrowhead, Slender Arrowhead [68483]		Species or species habitat likely to occur within area
<i>Salix</i> spp. except <i>S.babylonica</i> , <i>S.x calodendron</i> & <i>S.x reichardtii</i> Willows except Weeping Willow, Pussy Willow and Sterile Pussy Willow [68497]		Species or species habitat likely to occur within area
<i>Salvinia molesta</i> Salvinia, Giant Salvinia, Aquarium Watermoss, Kariba Weed [13665]		Species or species habitat likely to occur within area
<i>Senecio madagascariensis</i> Fireweed, Madagascar Ragwort, Madagascar Groundsel [2624]		Species or species habitat likely to occur within area
<b>Reptiles</b>		
<i>Hemidactylus frenatus</i> Asian House Gecko [1708]		Species or species habitat likely to occur within area



# Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World and National Heritage properties, Wetlands of International and National Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

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.

Threatened, migratory and marine species distributions have been derived through a variety of methods. Where distributions are well known and if time permits, maps are derived using either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc) together with point locations and described habitat; or environmental modelling (MAXENT or BIOCLIM habitat modelling) using point locations and environmental data layers.

Where very little information is available for species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc). In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More reliable distribution mapping methods are used to update these distributions as time permits.

Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers

The following groups have been mapped, but may not cover the complete distribution of the species:

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent

Such breeding sites may be important for the protection of the Commonwealth Marine environment.

# Coordinates

-30.1027 153.18391

# Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

- [-Office of Environment and Heritage, New South Wales](#)
- [-Department of Environment and Primary Industries, Victoria](#)
- [-Department of Primary Industries, Parks, Water and Environment, Tasmania](#)
- [-Department of Environment, Water and Natural Resources, South Australia](#)
- [-Department of Land and Resource Management, Northern Territory](#)
- [-Department of Environmental and Heritage Protection, Queensland](#)
- [-Department of Parks and Wildlife, Western Australia](#)
- [-Environment and Planning Directorate, ACT](#)
- [-Birdlife Australia](#)
- [-Australian Bird and Bat Banding Scheme](#)
- [-Australian National Wildlife Collection](#)
- [-Natural history museums of Australia](#)
- [-Museum Victoria](#)
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- [-South Australian Museum](#)
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- [-Museum and Art Gallery of the Northern Territory](#)
- [-Australian Government National Environmental Science Program](#)
- [-Australian Institute of Marine Science](#)
- [-Reef Life Survey Australia](#)
- [-American Museum of Natural History](#)
- [-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania](#)
- [-Tasmanian Museum and Art Gallery, Hobart, Tasmania](#)
- [-Other groups and individuals](#)

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the [Contact Us](#) page.

## Appendix 4 Flora survey results

Family name	Scientific name	Common name	Exotic
Apiaceae	<i>Hydrocotyle bonariensis</i>	Largeleaf Pennywork	*
Apocynaceae	<i>Araujia sericifera</i>	Moth vine	*
	<i>Asclepias curassavica</i>	Milkweed	*
	<i>Gomphocarpus physocarpus</i>	Balloon Cotton Bush	*
	<i>Parsonia straminea</i>	Common Silkpod	
Araliaceae	<i>Polyscias sambucifolia</i>	Elderberry Panax	
	<i>Schefflera actinophylla</i>	Umbrella tree	*
Asparagaceae	<i>Asparagus aethiopicus</i>	Asparagus Fern	*
Asteraceae	<i>Ageratum conyzoides</i>	Blue billygoat weed	*
	<i>Ageratum houstonianum</i>	Whiskey grass	*
	<i>Baccharis halimifolia</i>	Groundsel Bush	*
	<i>Bidens pilosa</i>	Cobbler's Pegs	*
	<i>Chrysanthemoides monilifera subsp. rotundata</i>	Bitou Bush	*
	<i>Cirsium vulgare</i>	Spear Thistle	*
	<i>Ozothamnus diosmifolius</i>	White Dogwood	
	<i>Senecio madagascariensis</i>	Fireweed	*
	<i>Tagetes minuta</i>	Stinking roger	*
Blechnaceae	<i>Blechnum cartilagineum</i>	Gristle Fern	
Casuarinaceae	<i>Allocasuarina torulosa</i>	Forest Oak	
Convolvulaceae	<i>Convolvulus erubescens</i>	Australian Bindweed	
	<i>Ipomoea cairica</i>	Mile-a-minute	*
Cupressaceae	<i>Callitris rhomboidea</i>	Port Jackson Pine	
Curcubitaceae	<i>Cucumis zeyheri</i>	South African spiny cucumber	*
Cyatheaceae	<i>Cyathea australis</i>	Rough Treefern	
Cyperaceae	<i>Baumea juncea</i>	Bare twigrush	
	<i>Baumea teretifolia</i>	Common twig rush	
Dennstaedtiaceae	<i>Pteridium esculentum</i>	Bracken	

Family name	Scientific name	Common name	Exotic
e			
Dilleniaceae	<i>Hibbertia scandens</i>	Climbing Guinea Flower	
Ericaceae	<i>Leucopogon pimeleoides</i>	Beard heath	
	<i>Trochocarpa laurina</i>	Tree Heath	
Escalloniaceae	<i>Cuttsia viburnea</i>	Elderberry	
Fabaceae	<i>Chorizema parviflorum</i>	Eastern Flame Pea	
	<i>Daviesia ulicifolia</i>	Gorse Bitter Pea	
	<i>Jacksonia scoparia</i>	Dogwood	
	<i>Kennedia rubicunda</i>	Dusky Coral-pea	
	<i>Senna pendula var. glabrata</i>	Winter Senna	*
	<i>Pultenaea retusa</i>	Notchedbush pea	
	<i>Acacia irrorata</i>	Green Wattle	
	<i>Acacia melanoxylon</i>	Blackwood	
Goodeniaceae	<i>Goodenia rotundifolia</i>	Round-leaved Goodenia	
Juncaceae	<i>Juncus usitatus</i>	Common rush	
Lauraceae	<i>Cinnamomum camphora</i>	Camphor Laurel	*
Lindsaeaceae	<i>Lindsaea microphylla</i>	Wedge fern	
Lomandraceae	<i>Lomandra longifolia</i>	Spiny-headed Mat-rush	
Luzuriagaceae	<i>Eustrephus latifolius</i>	Wombat Berry	
	<i>Geitonoplesium cymosum</i>	Scrambling Lily	
Malvaceae	<i>Sida rhombifolia</i>	Paddy's Lucerne	*
Menispermaceae	<i>Stephania japonica var. discolor</i>	Snake Vine	
Moraceae	<i>Ficus watkinsiana</i>	Strangling Fig	
Myrtaceae	<i>Corymbia intermedia</i>	Pink Bloodwood	
	<i>Eucalyptus eugonoides</i>	Thin-leaved stringbark	
	<i>Eucalyptus microcorys</i>	Tallowwood	
	<i>Eucalyptus pilularis</i>	Blackbutt	
	<i>Eucalyptus propinqua</i>	Small-fruited Grey Gum	
	<i>Eucalyptus siderophloia</i>	Grey Ironbark	

Family name	Scientific name	Common name	Exotic
	<i>Eucalyptus tereticornis</i>	Forest Red Gum	
	<i>Lophostemon confertus</i>	Brush Box	
	<i>Lophostemon suaveolens</i>	Swamp Mahogany, Swamp Turpentine	
	<i>Melaleuca quinquenervia</i>	Broad-leaved Paperbark	
	<i>Syncarpia glomulifera</i>	Turpentine	
Ochnaceae	<i>Ochna serrulata</i>	Mickey Mouse Plant	*
Oleaceae	<i>Notelaea longifolia</i>	Large Mock-olive	
	<i>Notelaea venosa</i>	Veined Mock-olive	
Orchidaceae	<i>Dipodium punctatum</i>	Blotched Hyacinth Orchid	
	<i>Spiranthis sinensis</i>	Chinese sinensis	
Passifloraceae	<i>Passiflora spp.</i>		*
	<i>Passiflora suberosa</i>	Cork Passionfruit	*
	<i>Passiflora subpeltata</i>	White Passionflower	*
Philydraceae	<i>Philydrum lanuginosum</i>	Woolly Frogmouth	
Phormiaceae	<i>Dianella caerulea</i>	Blue Flax-lily	
Phyllanthaceae	<i>Breynia oblongifolia</i>	Coffee Bush	
	<i>Glochidion ferdinandi</i>	Cheese Tree	
Pinaceae	<i>Pinus elliottii</i>	Slash pine	*
Pittosporaceae	<i>Billardiera scandens</i>	Hairy Apple Berry	
	<i>Pittosporum undulatum</i>	Sweet Pittosporum	
Poaceae	<i>Andropogon virginicus</i>	Whisky Grass	*
	<i>Axonopus fissifolius</i>	Narrow-leaved Carpet Grass	*
	<i>Chloris gayana</i>	Rhodes Grass	*
	<i>Cymbopogon refractus</i>	Barbed wire grass	
	<i>Echinopogon caespitosus</i>	Bushy Hedgehog-grass	
	<i>Imperata cylindrica</i>	Blady Grass	
	<i>Oplismenus aemulus</i>	Basket grass	
	<i>Paspalum mandiocanum</i>	Broadleaf Paspalum	*
	<i>Paspalum urvillei</i>	Vasey Grass	*

Family name	Scientific name	Common name	Exotic
	<i>Pennisetum clandestinum</i>	Kikuyu Grass	*
	<i>Setaria sphacelata</i>	South African Pigeon Grass	*
	<i>Themeda triandra</i>	Kangaroo grass	
Polygonaceae	<i>Persicaria spp.</i>	Knotweed	*
Proteaceae	<i>Grevillea robusta</i>	Silky Oak	*
	<i>Persoonia stradbokensis</i>	Geebung	
Rubiaceae	<i>Psychotria loniceroides</i>	Hairy Psychotria	
Rutaceae	<i>Citrus limon</i>	Bush lemon	*
Sapindaceae	<i>Cupaniopsis anacardioides</i>	Tuckeroo	
	<i>Jagera pseudorhus var. pseudorhus</i>	Foambark Tree	
Scrophulariaceae	<i>Digitalis purpurea</i>	Foxglove	*
Solanaceae	<i>Solanum mauritianum</i>	Wild Tobacco Bush	*
Stackhousiaceae	<i>Stackhousia viminea</i>	Slender stachousia	
Thymelaeaceae	<i>Pimelia latifolia subsp. altior</i>	Broad-leaved Riceflower	
Verbenaceae	<i>Lantana camara</i>	Lantana	*
	<i>Verbena bonariensis</i>	Purpletop	*
Vitaceae	<i>Cissus antarctica</i>	Water Vine	
	<i>Cissus hypoglauca</i>	Giant Water Vine	

## Appendix 5 Fauna survey results

Class name	Scientific name	Common name
Frogs	<i>Litoria fallax</i>	Eastern Dwarf Tree Frog
Birds	<i>Accipiter novaehollandiae</i>	Grey Goshawk
	<i>Acrocephalus australis</i>	Australian Reed Warbler
	<i>Calyptorhynchus funereus</i>	Yellow-tailed Black-Cockatoo
	<i>Coracina tenuirostris</i>	Cicadabird
	<i>Corvus tasmanicus</i>	Forest Raven
	<i>Dacelo novaeguineae</i>	Laughing Kookaburra
	<i>Eopsaltria australis</i>	Eastern Yellow Robin
	<i>Eudynamys orientalis</i>	Eastern Koel
	<i>Eurystomus orientalis</i>	Dollarbird
	<i>Haliastur sphenurus</i>	Whistling Kite
	<i>Hirundo neoxena</i>	Welcome Swallow
	<i>Lopholaimus antarctica</i>	Topknot pigeon
	<i>Malurus cyaneus</i>	Superb Fairy-wren
	<i>Malurus melanocephalus</i>	Red-backed Fairy-wren
	<i>Manorina melanocephala</i>	Noisy Miner
	<i>Meliphaga lewinii</i>	Lewin's Honeyeater
	<i>Merops ornatus</i>	Rainbow Bee-eater
	<i>Neochmia temporalis</i>	Red-browed Finch
	<i>Philemon citreogularis</i>	Little Friarbird
	<i>Psophodes olivaceus</i>	Eastern Whipbird
<i>Rhipidura albiscapa</i>	Grey Fantail	
<i>Strepera graculina</i>	Pied Currawong	
<i>Todiramphus sanctus</i>	Sacred Kingfisher	
<i>Trichoglossus haematodus</i>	Rainbow Lorikeet	
<i>Zosterops lateralis</i>	Silvereye	
Mammals	<i>Canis lupus</i>	Dingo, domestic dog

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Class name	Scientific name	Common name
	<i>Macropus giganteus</i>	Eastern Grey Kangaroo
	<i>Macropus rufogriseus</i>	Red-necked Wallaby



## Revision History

Revision No.	Revision date	Details	Prepared by	Reviewed by	Approved by
00	31/08/2018	Newmans Road – southern precinct Ecological Assessment	Nigel Cotsell Senior Ecologist	Trudy Thompson Senior Environmental Scientist	Diane Lanyon General Manager

## Distribution List

Copy #	Date	Type	Issued to	Name
1	14/09/2018	Electronic	Keiley Hunter Urban Planner	Keiley Hunter
2	14/09/2018	Electronic	Ecosure	Administration

Citation: Ecosure (2018), Newmans Road – southern precinct Ecological Assessment, Final Report to Keiley Hunter Urban Planner, Publication Location –Coffs Harbour

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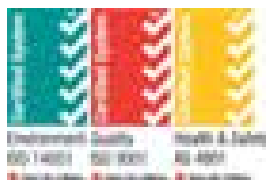
PO Box 404  
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### Sydney

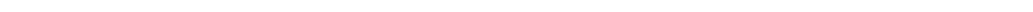
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# Appendix F ~ Bushfire Report





# BUSHFIRE HAZARD ASSESSMENT REPORT

REPORT PREPARED IN RELATION TO:	<b>PROPOSED REZONING AND SUBDIVISION MINISTERIAL DIRECTIONS UNDER THE EP&amp;A ACT (SECTION 117, 4.4 BUSHFIRE PROTECTION)</b>
PROPERTY DESCRIPTION:	<b>PART LOT 202 IN DP 874273, NEWMANS ROAD, WOOLGOOLGA, NSW.</b>
REPORT COMMISSIONED BY: (my Client)	<b>Ecosure Pty Ltd.</b>
	 DATE ISSUED: <i>14 September 2018</i>

## **IMPORTANT NOTICE**

Site inspections, and the results found herein, are carried out in accordance with the methodology as set out in the document "*Planning for Bushfire Protection 2006*".

The results of the site inspections and their correlation with *PBP-2006* are based on information provided by the "Reference Documents" and information provided by the Client (or his/her agents).

**Holiday Coast Bushfire Solutions Pty Ltd** will not be held liable for the omission to provide, or restrict access to, critical information (such as restrictions on property Title, easements, relevant consultant reports, etc) relevant to this development proposal.

The author of this Report, S. Ellis, possesses qualifications that include Graduate Diploma in Design for Bushfire Prone Areas (UWS) and Certificate 2 & 3 in Firefighting Operations and Certificate 4 in Firefighting Supervision.



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## Glossary

APZ	- Asset protection zone. An area surrounding a development managed to reduce the bush fire hazard to an acceptable level. The APZ, consisting of an area maintained to minimal fuel loads and, for subdivision, comprising a combination of perimeter road, fire trail, rear yard or a reserve, so that a fire path is not created between the hazard and the building.
AS 3959	- Australian Standard AS3959 Construction of buildings in bushfire-prone areas, Standards Australia, 2009, that outlines construction standards applicable to residential developments in bush fire prone areas.
BAL	- Bushfire Attack Level – refer to CoBA below.
BCA	- Building Code of Australia.
BPM	- Bushfire protection measures. A range of measures (controls) available to minimise the risk arising from a bushfire. BPMs include APZs, construction standards, suitable access arrangements, water and utility services, emergency management arrangements and landscaping.
Bushfire hazard	- The potential severity of a bushfire. Usually measured in terms of intensity (kW/m), the factors that influence a bush fire hazard include climate and weather patterns, vegetation (fuel quantity, distribution and moisture) and slope.
Bushfire-prone area / land	- An area of land that can support a bushfire or is likely to be subject to bushfire attack. In general, a bushfire-prone area is an area mapped for a local government area that identifies the vegetation types and associated buffer zones. Bushfire prone land maps are prepared by local councils and certified by the Commissioner of the RFS.
Bushfire risk	- Is the chance of a bushfire igniting, spreading and causing damage to assets of value to the community. Risk may be rated as being extreme, major, moderate, minor or insignificant and is related to the vulnerability of the asset.
CoBA	- Category of Bushfire Attack. Either BAL-12.5, BAL-19, BAL-29, BAL-40, or BAL-FLAME ZONE. The degree to which a (proposed) building is subject to the modelled RHF from a potential bushfire. The CoBA determines the construction standards applicable.
Contagious Ignition	- The ignition of one building by an adjoining flaming building (or material) <u>other than</u> by the direct ignition from the flaming bushfire hazard.




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Defendable Space	- An area within the APZ that provides an environment in which a person can undertake property protection after the passage of a bushfire with some level of safety.
D-T-S	- Deemed to Satisfy (prescriptive requirements of either the BCA or <b>PBP-2006</b> ).
DE	- Dwelling or Building Envelope. The foot print of a (proposed) structure.
FFDI	- Forest fire danger index.
Flame Zone	- The distance from a bushfire at which it is calculated for the purposes of this document that there is significantly increased likelihood for flame contact to a building. Determined by the calculated distance at which the radiant heat received by the proposed building exceeds 40kW/m <sup>2</sup> or calculated by the point of potential flame contact, whichever occurs first.
IFEG-2005	- International Fire Engineering Guidelines (Edition 2005).
Infill Development	- The development of land by the erection of or addition to a residential building (or buildings) which does not require the spatial extension of services including public roads, electricity, water or sewerage and is within an existing allotment.
Inner Protection Area	- The inner component of an asset protection zone, consisting of an area maintained to minimal fuel loads and comprising a combination of perimeter road, fire trail, rear yard or reserve, so that a fire path is not created between the hazard and the building.
Outer Protection Area	- The outer component of an asset protection zone, where fuel loads are maintained at a level (usually less than 8 t/ha) where the intensity of an approaching bushfire would be significantly reduced.
<i>Required</i>	- Required by <b>PBP-2006</b> or other legislative requirements.
Setback	- The distance required through planning provisions to separate a building from the bushfire hazard, street frontage or from adjacent buildings. In most cases the land within the setback will also be within the Flame Zone.



## 1.0 GENERAL DESCRIPTION OF LAND AND PROPOSAL

### 1.1 Introduction

This Report is prepared as a Report that addresses both the Ministerial Directions and the requirements of *PBP-2006*.

The initial site constraints were assessed in June of 2016. These constraints were identified on sketches provided to the Client, and included the indicative vegetation classes occurring at that time, and effective slopes. Since that time, assessments have been carried out by other project experts, some of which have altered the site's bushfire constraints.

### 1.2 The Land

The site is located on the northern outskirts of Woolgoolga, on the mid-north coast. The site is identified as the southern portion of lot 202//874273, located on the northern side of Newman's Road.

The site is constrained, from a bushfire-perspective, generally by remnant vegetation. The only large parcel of un-managed vegetation within the assessment area around the site is on its north-eastern exposure, surrounding the neighbouring Woolgoolga High School.



Figure 1: map showing general locality of subject site (© Google Maps 2017)

The parcel was vacant at the time of the site assessments. The parcel was overgrown with unmanaged grass and remnant vegetation. The property boundaries were not able to be identified as they were not pegged or otherwise marked, or due to their overgrown



nature, any boundary markings were not able to be found. The topography of the site varied from slight to moderate.

The site has an area of approximately 9.0 hectares, with a perimeter of approximately 1.7km. This parcel is bordered to the west, north and east by CHCC-managed land. To the north is a riparian remnant along its northern boundary with the planned sporting precinct further north. The land to the east and west is a strip of regrowth that comprises a structure consistent with a *tall heath*. The land beyond the CHCC land is managed in one way or another.



Figure 2: aerial image of southern parcel (© NSW Lands, 2017)

Bushfire prone land maps provide the trigger for the various development assessment provisions. The identification of bushfire-prone areas in NSW is required under section 146 of the *EP&A Act*. The NSW Rural Fire Service designates, through separate guidelines, what constitutes a bushfire-prone area and how it is to be mapped. Each Council then prepares a map in accordance with the guidelines and submits the map for approval by the NSW Rural Fire Service.

The subject site has been identified as bushfire-prone land by the Coffs Harbour City Council's Bushfire Prone Land Map, an extract of which is provided below.



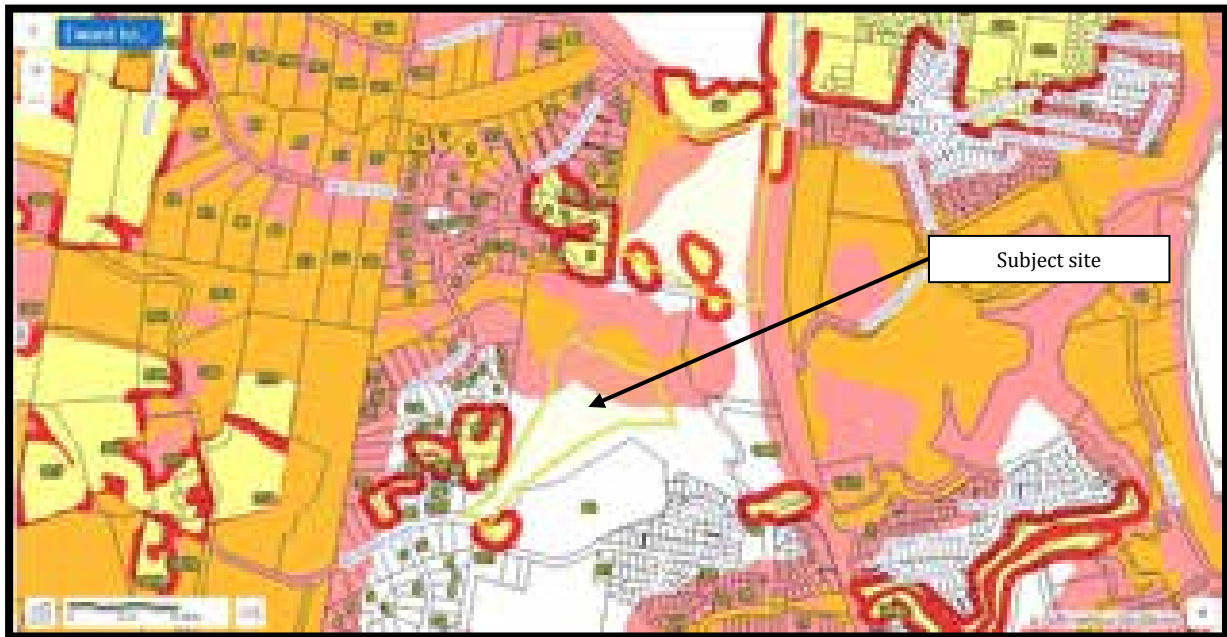


Figure 3: extract of CHCC's BPLM (© CHCC, 2018)

## 1.3 The Proposal

**Holiday Coast Bushfire Solutions Pty Ltd** has been engaged by the Client to provide a Bushfire Hazard Assessment Report to support a rezoning application and subdivision application.

The proposal will be measured against the specific requirements outlined in division 9.1 (Ministerial Directions, provided below) of the *EP&A Act 1979*, as well as the residential subdivision provisions of *PBP-2006*.

### Division 9.1 of the Environmental Planning & Assessment Act 1979

#### 4.4 Planning for Bushfire Protection

##### Objectives

(1) The objectives of this direction are:

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

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

##### Where this direction applies

(2) This direction applies to all councils that are required to prepare a bush fire prone land map under section 146 of the *Environmental Planning and Assessment Act 1979* (the *EP&A Act*), or, until such a map has been certified by the Commissioner of the NSW Rural Fire Service, a map referred to in Schedule 6 of that Act.

##### When this direction applies

(3) This direction applies when a council prepares a draft LEP that affects, or is in proximity to land mapped as bushfire prone land.

##### What a council must do if this direction applies



(4) In the preparation of a draft LEP a Council shall consult with the Commissioner of the NSW Rural Fire Service under section 62 of the EP&A Act, and take into account any comments so made,

(5) A draft LEP shall:

(a) have regard to *Planning for Bushfire Protection 2006*,

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

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

(6) A draft LEP shall, where development is proposed, comply with the following provisions, as appropriate:

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

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

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

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

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

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

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

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

Consistency

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

In accordance with the NSW Rural Fire Service document "Practice Note 5/12 - Reuse of Rezoning Reports on Bushfire Prone Land", this Report will address the proposal from a strategic-planning perspective as well as address the subdivision provisions of *PBP-2006*.

As well as addressing the matters contained in the Ministerial Direction 4.4 (division 9.1 of the *Environmental Planning & Assessment Act*), this Report will assess the proposal against the provisions contained in Clause 44 of the *Rural Fires Regulation*.



*Figure 4: extract of concept subdivision plan for southern site, provided by Ecosure Pty Ltd, 21/08/2018*



## 2.0 VEGETATION AND SLOPE ASSESSMENT

The following procedure is to be adopted when assessing a development at a defined precinct level in order to determine whether the development is bush fire prone and if so, which setbacks will be appropriate:

- (a) Determine vegetation formations, as follows:
  - (i) identify all vegetation in all directions from the site for a distance of 140 metres;
  - (ii) consult Table A2.1 of PBP-2006 to determine the predominant vegetation type; and
  - (iii) select the predominant vegetation formation as described in Table A2.1 of PBP-2006.
- (b) Determine the effective slope of the land under the Predominant Vegetation Class and the site.
- (c) Determine the appropriate fire (weather) area in Table A2.3 of PBP-2006 and note the relevant FDI.
- (d) Consult Tables A2.4–2.7 of PBP-2006 and determine the appropriate setback for the assessed land use, vegetation group and slope range.

The vegetation and slope assessment used for this Report is based on the previous assessment carried out by this office and provided to the Client on 14/6/16. The following Figures set out a summary of the vegetation and slope assessment determined at that time.



Figure 5: vegetation and slope assessment (June 2016)

Although some of the vegetation found on the lands adjoining the sites did not neatly fit into any of the vegetation classifications depicted in the indicative vegetation classes within *PBP-2006*, they have been classed as depicted above due to their structure at the time of the site assessment.

### Post Initial Site Assessment

Through the process of preparing the Planning Proposal, areas of the site previously not occupied by bushfire hazard vegetation have been identified for revegetation. This has



affected the initial site assessment information gathered during the 2016 site assessment. The following Figure is a reproduction of Figure 5 above, except they recognise the amended indicative vegetation classes due to the proposed revegetation.

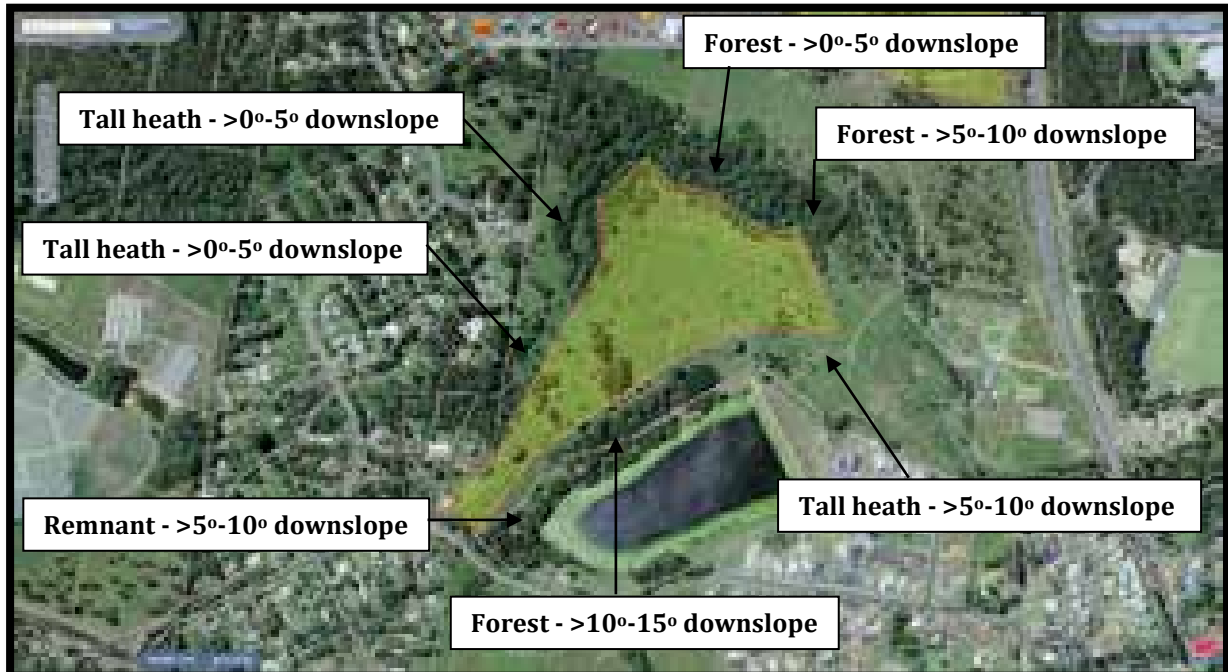


Figure 6: amended vegetation and slope assessment

## 3.0 BUSHFIRE ASSESSMENT MATTERS

### 3.1 Ministerial Directions

The following sub-sections of this Report will be formulated from the requirements of the Ministerial Directions 4.4 as stipulated in division 9.1 of the *EP&A Act*.

#### 3.1.1 A draft LEP shall have regard to *PBP-2006*.

This Report will aim to address the requirements of the *EP&A Act* and *PBP-2006* as they relate to the bushfire constraints of the site.

It should be pointed out that *PBP-2006* is primarily concerned with residential development and *Special Fire Protection Purpose (SFPP)* developments. Apart from s.4.3.6(f), *PBP-2006* is essentially silent in relation to commercial or industrial land. Whilst commercial and industrial developments do not ordinarily accommodate residential uses, the bushfire-resilience of these types of developments should be no less important from a business-continuity and community-recovery perspective.

In relation to land proposed to be rezoned for residential purposes, or land that could accommodate a development that is defined as a *Special Fire Protection Purpose* development under s.100B of the Rural Fires Act, a Bushfire Assessment should



determine those parts of the site that are unsuitable for accommodating residential or *Special Fire Protection Purpose* developments. The Client should prepare a plan showing the minimum APZs to achieve a BAL-29 construction in accordance with *AS3959-2009 Construction of buildings in bushfire-prone areas*. The information required for the creation of that plan is provided at section 3.2.4.7 of this Report.

### 3.1.2 A draft LEP shall introduce controls that avoid placing inappropriate developments in hazardous areas.

*PBP-2006* and *PBP-2001* provide lists of development types that are both suitable, and unsuitable, for bushfire-prone areas, summarised as follows:

Table 1

Not Desirable	Desirable
<ul style="list-style-type: none"> <li>• Camping grounds</li> <li>• Assembly buildings</li> <li>• Land sharing communities</li> <li>• Commercial and retail premises</li> <li>• Education premises</li> <li>• Prisons</li> <li>• Premises for people with mental or physical incapacities</li> <li>• Hospitals</li> <li>• Flammable material bulk storage</li> <li>• Stock / sale yards</li> <li>• Timber yards</li> <li>• Factories / warehouses</li> <li>• Plantations</li> <li>• Waste disposal / landfill depots</li> <li>• Power generating works</li> <li>• Sawmills</li> <li>• Junk yards</li> <li>• Liquid fuel depots</li> <li>• Offensive and hazardous industries</li> <li>• Chemical industries</li> <li>• Service stations</li> <li>• Ammunition storage/manufacture</li> <li>• Fireworks manufacture/storage</li> </ul>	<ul style="list-style-type: none"> <li>• Tennis courts</li> <li>• Golf courses</li> <li>• Swimming pools</li> <li>• Cemeteries</li> <li>• Airstrips</li> <li>• Cleared open space / recreation areas</li> </ul>

The LEP should prohibit the listed developments as “not desirable” within the bushfire-prone areas (land within 100m of identified bushfire hazard vegetation) of the subject site.



### **3.1.3 A draft LEP shall ensure that bushfire hazard reduction is not prohibited within the APZ.**

Parts of the site are proposed to be Zoned E3 under the LEP.

Where the APZ is proposed to be incorporated into the proposed E3 Zone, the LEP should acknowledge that the component of the APZ on the E3 Zone will be the Outer Protection Area (OPA) only. This will allow for significant woody vegetation to be retained within the E3 area while meeting the performance criteria of an OPA as defined by the Rural Fire Service document "*Standards for Asset Protection Zones*".

The creation of the OPA on the E3 Zone areas is to provide for the reduction of bushfire fuel in this area to decrease the intensity of an approaching fire and restricting the pathways, or 'wicks', to 'crown' or elevated fuels.

Within the OPA any trees and shrubs should be maintained in such a manner that the vegetation is not continuous. Fine fuel loadings within the OPA should be kept to a level where the fire intensity expected will have no significant impact on adjacent developments. Eight (8) tonnes per hectare of fuel is commonly used. Essentially trees and shrubs should be discontinuous, and grass maintained below 10 centimetres in height.

All of the land on the subject sites other than the retained native vegetation is to have no restriction placed on it that prohibits APZ maintenance. This will include restrictions such as "tree preservation orders" and the like.

Any development consent of future developments on the bushfire-prone land should impose conditions that require the management of vegetation within the development site to ensure that bushfire hazard vegetation does not regenerate on the site.

Also refer to section 3.2.1 below.

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

There are no existing assets identified on the site, therefore the infill provisions of *PBP-2006* are not applicable.



### 3.1.5 Contain provisions for two-way access roads which links to perimeter roads and/or to fire trail networks.

*PBP-2006* states it is preferable to have roads interfacing with unmanaged bushfire hazard vegetation rather than individual lots, where practical. Although the results of the Canberra fires in 2003 would suggest that perimeter roads have their own set of problems, which can be overcome with fire trails and non-perimeter roads.

Notwithstanding, the proposed lot layout incorporates perimeter road along the eastern boundary, interfacing with the forest vegetation. The perimeter road will allow for 2-way access and have a minimum width of 8m as per the *PBP-2006* requirements. The perimeter road should link with internal roads at intervals of not greater than 500m, as per the *PBP-2006* requirement.

Even though some of the site will eventually be located outside bushfire-prone land, the road network should link with the existing public road with roads of a commensurate width, i.e., road widths do not diminish from the interface to the existing public roads. All other road widths should comply with the following Table (road widths for medium-rigid vehicles).

Curve radius (inside edge) (metres)	Sweep Path (metres width)	Single lane (metres width)	Two way (metres width)
<40	3.5	4.5	8.0
40-69	3.0	3.9	7.5
70-100	2.7	3.6	6.9
>100	2.5	3.5	6.5

Figure 7: Source: AS 2890.2 – 2002

The road network for the site is exposed to a traffic *pinch-point* due to the creation of an E3 Zone corridor through the site.

### 3.1.6 Contain provisions for adequate water supply for firefighting purposes.

Fire hydrants should be located within the footpaths / nature strips at intervals not exceeding 90m. An hydraulic analysis should be undertaken to ensure that flow rates and pressures are commensurate with *AS 2419.1-2005 Fire hydrant installations - System design, installation and commissioning* (10 L/s at 150 kPa).

### 3.1.7 Minimise the perimeter of the area of land interfacing the hazard which may be developed.

The perimeter of the site that interfaces with bushfire hazard vegetation is unable to be altered. Furthermore, the creation of an E3 Zone corridor through the site increases the





bushfire risk to the site, and creates a traffic *pinch-point* where the corridor crosses the proposed perimeter road.

Perimeter roads locate the future development further from the interface, but the area of land interfacing with the existing bushfire hazard vegetation, surrounding and within the site, is unable to be significantly altered.

### **3.1.8 Introduce controls on the placement of combustible materials in the Inner Protection Area.**

Perimeter roads or open space recreation areas (such as playgrounds and the like) would enable bushfire fuel loads within the IPA to be minimised. Such planning would enable routine management of those areas to maintain bushfire fuel loads to an acceptable level.

Additionally, prohibiting certain development (refer to list as Table 1) on bushfire-prone land provides another means to limit the possibility of compromising the effectiveness of an APZ.

## **3.2 RURAL FIRES REGULATION - CLAUSE 44.**

### **3.2.1 Identification of any significant environmental features on the property**

This matter is to be addressed by the applicant in a Statement of Environmental Effects.

### **3.2.2 The details of any threatened species, population or ecological community identified under the [Threatened Species Conservation Act 1995](#) that is known to the applicant to exist on the property**

This matter is to be addressed by the applicant in a Statement of Environmental Effects.

### **3.2.3 The details and location of any Aboriginal object (within the meaning of the [National Parks and Wildlife Act 1974](#)) or Aboriginal place (within the meaning of that Act) that is known to the applicant to be situated on the property**

This matter is to be addressed by the applicant in a Statement of Environmental Effects.



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### **3.2.4 A bush fire assessment for the proposed development (including the methodology used in the assessment) that addresses the following matters:**

#### **3.2.4.1 The extent to which the development is to provide for setbacks, including asset protection zones**

APZs are addressed in detail in Section 3.3.1 of this Report, below. That Section addresses the minimum setbacks from the identified bushfire hazard vegetation in order to meet the provisions of Appendix 2 of *PBP-2006*.

The broader planning issues regarding APZs are addressed in the sub-sections of Section 3.1 of this Report, above.

#### **3.2.4.2 The siting and adequacy of water supplies for fire fighting**

The Client advises that the proposed subdivision will be provided with a reticulated water supply. This negates the need for additional water supplies for firefighting purposes.

The specific requirements relating to the location of the firefighting water supply are addressed at Section 3.3.5 of this Report, below.

#### **3.2.4.3 The capacity of public roads in the vicinity to handle increased volumes of traffic in the event of a bush fire emergency**

The existing public roads servicing the site all have a proven capacity to handle 2-way traffic. Newman's Road also links with the old Pacific Highway to the east of the site.

The width and gradient of the new public roads will meet the standards required by *PBP-2006*, and are addressed at section 3.3.2 of this Report.

#### **3.2.4.4 Whether or not public roads in the vicinity that link with the fire trail network have two-way access**

There are no existing or proposed fire trails, within or immediately adjacent to, the sites.

#### **3.2.4.5 The adequacy of arrangements for access to and egress from the development site for the purposes of an emergency response**

The width and gradient of the new public roads will meet the standards required by *PBP-2006*. These matters are dealt with in more detail at section 3.3.2 of this Report.



### 3.2.4.6 The adequacy of bush fire maintenance plans and fire emergency procedures for the development site

A Vegetation Management Plan should be developed for the site if the proposed subdivision is to be released in a 'Staged' manner. Essentially the goal for the release of the land should be to provide a perimeter road or temporary fire trail separating the Stage from the undeveloped part of the site, and to ensure that regular management occurs on the undeveloped land to ensure bushfire hazard vegetation does not regenerate on the site. The remainder of the site should be managed as an "outer protection area" as described in the NSW Rural Fire Service document titled "Standards for Asset Protection Zones" and Appendix 5 of *PBP-2006*, provided as Appendix A of this Report. The temporary APZ should be created and maintained on land owned by the developer, or by other legally-binding arrangement such as s.88B of the *Conveyancing Act 1919*.

### 3.2.4.7 The construction standards to be used for building elements in the development

*PBP-2006* contains 2 separate, and different, methods of determining residential building setbacks from bushfire hazard vegetation. Appendix 2 of *PBP-2006* is used to determine an APZ distance, and these distances are provided in Table A2.5, provided below.

Vegetation Formation	Effective Slopes				
	Upslope/Flat	<0°-5°	5°-10°	10°-15°	15°-30°
Rainforests	10	10	15	15	20
Forests	20	20	30	40	45
Woodland	10	15	15	20	25
Plantations (Pine)	10	20	25	25	40
Tall Heath (Scrub)	15	15	20	20	30
Short Heath (Open Scrub)	10	10	10	15	15
Freshwater Wetlands	10	10	10	15	15
Forested Wetlands	15	20	20	20	25
Semi-Arid (Woodland)	10	10	10	10	15
Soil Shrubland	10	10	10	15	15

Figure 8: table A2.5 of *PBP-2006*

Alternatively, to determine the Bushfire Attack Level (BAL) zones so that compliance with *AS 3959-2009 Construction of buildings in bushfire-prone areas* can be verified and accomplished, Addendum Appendix 3 of *PBP-2006* is used, and these distances are provided in Table 2.4.3 of *AS3959-2009 Construction of buildings in bushfire-prone areas*, provided below.



Vegetation classification	Bushfire Attack Levels (BALs)				
	BAL—FZ	BAL—40	BAL—29	BAL—19	BAL—12.5
	Distance (m) of the site from the predominant vegetation class				
	All upslopes and flat land (0 degrees)				
A. Forest	<16	16–21	21–31	31–42	42–<100
B. Woodland	<10	10–14	14–20	20–29	29–<100
C. Shrubland	<7	7–9	9–13	13–19	19–<100
D. Scrub	<10	10–13	13–19	19–27	27–<100
E. Mallee/Mulga	<6	6–8	8–12	12–17	17–<100
F. Rainforest	<6	6–9	9–13	13–19	19–<100
G. Grassland	<6	6–8	8–12	12–17	17–50
	Downslope >0 to 5 degrees				
A. Forest	<20	20–27	27–37	37–50	50–<100
B. Woodland	<13	13–17	17–23	23–33	33–<100
C. Shrubland	<7	7–10	10–15	15–22	22–<100
D. Scrub	<11	11–15	15–22	22–31	31–<100
E. Mallee/Mulga	<7	7–9	9–13	13–20	20–<100
F. Rainforest	<8	8–11	11–17	17–24	24–<100
G. Grassland	<7	7–9	9–14	14–20	20–50
	Downslope >5 to 10 degrees				
A. Forest	<26	26–33	33–46	46–61	61–<100
B. Woodland	<16	16–22	22–31	31–43	43–<100
C. Shrubland	<8	8–11	11–17	17–25	25–<100
D. Scrub	<12	12–17	17–24	24–35	35–<100
E. Mallee/Mulga	<7	7–10	10–15	15–23	23–<100
F. Rainforest	<11	11–15	15–22	22–31	31–<100
G. Grassland	<8	8–10	10–16	16–23	23–50
	Downslope >10 to 15 degrees				
A. Forest	<33	33–42	42–56	56–73	73–<100
B. Woodland	<21	21–28	28–39	39–53	53–<100
C. Shrubland	<9	9–13	13–19	19–28	28–<100
D. Scrub	<14	14–19	19–28	28–39	39–<100
E. Mallee/Mulga	<8	8–11	11–18	18–26	26–<100
F. Rainforest	<14	14–19	19–28	28–39	39–<100
G. Grassland	<9	9–12	12–18	18–26	26–50
	Downslope >15 to 20 degrees				
A. Forest	<42	42–52	52–68	68–87	87–<100
B. Woodland	<27	27–35	35–48	48–64	64–<100
C. Shrubland	<10	10–15	15–22	22–31	31–<100
D. Scrub	<15	15–21	21–31	31–43	43–<100
E. Mallee/Mulga	<9	9–13	13–20	20–29	29–<100
F. Rainforest	<18	18–25	25–36	36–48	48–<100
G. Grassland	<10	10–14	14–21	21–30	30–50

Figure 9: Table 2.4.3 of AS3959-2009



### 3.2.4.8 The adequacy of sprinkler systems and other fire protection measures to be incorporated into the development

Bushfire-sprinkler systems will not be required for development on these sites.

## 3.3 CHAPTER 4 OF PBP-2006.

### 3.3.1 Asset Protection Zones

Table 2

ASSET PROTECTION ZONES Intent of measures: to provide sufficient space and maintain reduced fuel loads, so as to ensure radiant heat levels at buildings are below critical limits and to prevent direct flame contact with a building.		COMPLIES / DOES NOT COMPLY
Performance Criteria	Acceptable solutions	
The intent may be achieved where:		
• Radiant heat levels at any point on a proposed building will not exceed 29 kW/m <sup>2</sup> .	[1] An APZ is provided in accordance with the relevant tables/ figures in Appendix 2 of PBP-2006.  [2] The APZ is wholly within the boundaries of the development site. Exceptional circumstances may apply [see section 3.3]	Complies  Complies
• APZs are managed and maintained to prevent the spread of a fire towards the building.	[3] In accordance with the requirements of Standards for Asset Protection Zones (RFS, 2005)  <i>Note: A Monitoring and Fuel Management Program should be required as a condition of development consent.</i>	Complies
• APZ maintenance is practical, soil stability is not compromised and the potential for crown fires is negated.	[4] The APZ is located on lands with a slope less than 18°.	Complies

In relation to *Acceptable Solution 1*, the minimum separation / APZ required by PBP-2006 are provided in Appendix 2 of PBP-2006. These distances are summarised for the 2 sites in the following table.

Table 3

	Vegetation Classification	Effective Slope	Minimum APZ (App.2 of PBP-2006)
North	Forest	0° - level	20m
East	Tall Heath	>5°-10° downslope	20m
	Forest	>10°-15° downslope	40m
	Remnant	>5°-10° downslope	15m
West	Tall Heath	>5°-10° downslope	20m



In relation to *Acceptable Solution 2*, all of the required setbacks are able to be provided within the subject site being developed.

In relation to *Acceptable Solution 3*, a vegetation management plan should be developed for the site. The purpose of the VMP is to formalise the vegetation management regime over the site where the development is 'Staged'. Essentially the goal for the release of the land should be to provide a perimeter road or temporary fire trail separating the Stage from the un-developed part of the site, and to ensure that regular management occurs on the un-developed land to ensure bushfire hazard vegetation does not regenerate on the site. The remainder of the site should be managed as an "outer protection area" as described in the NSW Rural Fire Service document titled "Standards for Asset Protection Zones" and Appendix 5 of *PBP-2006*, provided as Appendix A of this Report. These documents have been provided as Appendix A of this Report for the benefit of the Client.

### 3.3.2 Public Roads

Table 4

ACCESS – PUBLIC ROADS Intent of measures: to provide safe operational access to structures and water supply for emergency services, while residents are seeking to evacuate from an area.		COMPLIES / DOES NOT COMPLY
Performance Criteria	Acceptable solutions	
The intent may be achieved where:		
<ul style="list-style-type: none"> <li>Firefighters are provided with safe all weather access to structures (thus allowing more efficient use of firefighting resources).</li> </ul>	<p>(5) Public roads are two-wheel drive, all weather roads.</p>	Complies
<ul style="list-style-type: none"> <li>Public road widths and design that allow safe access for firefighters while residents are evacuating an area.</li> </ul>	<p>(6) Urban perimeter roads are two-way, that is, at least two traffic lane widths (carriageway 8m minimum kerb to kerb), allowing traffic to pass in opposite directions. Non-perimeter roads comply with Table 4.1 – Road widths for Category 1 Tanker (Medium Rigid Vehicle).</p> <p>(7) The perimeter road is linked to the internal road system at an interval of no greater than 500m in urban areas.</p> <p>(8) Traffic management devices are constructed to facilitate access by emergency services vehicles.</p> <p>(9) Public roads have a cross fall not exceeding 3°.</p>	<p>Complies</p> <p>Complies</p> <p>Complies</p> <p>Complies</p>



	<p><b>[10]</b> All roads are through-roads. Dead-end roads are not recommended, but if unavoidable, dead-ends are not more than 200m in length, incorporate a minimum 12m outer radius turning circle, and are clearly sign posted as a dead-end and direct traffic away from the hazard.</p> <p><b>[11]</b> Curves of roads (other than perimeter roads) are a minimum inner radius of 6m and minimal in number, to allow for rapid access and egress.</p> <p><b>[12]</b> The minimum distance between inner and outer curves is 6m.</p> <p><b>[13]</b> Maximum grades for sealed roads do not exceed 15° and an average grade of not more than 10° or other gradient specified by road design standards, whichever is the lesser gradient.</p> <p><b>[14]</b> There is a minimum vertical clearance to a height of 4m above the road at all times.</p>	<p>Complies</p> <p>Complies</p> <p>Complies</p> <p>Complies</p> <p>Complies</p>
<ul style="list-style-type: none"> <li>The capacity of road surfaces and bridges is sufficient to carry fully loaded firefighting vehicles.</li> </ul>	<p><b>[15]</b> The capacity of road surfaces and bridges is sufficient to carry fully loaded firefighting vehicles (approximately 15 tonnes for areas with reticulated water, 28 tonnes or 9 tonnes per axle for all other areas). Bridges clearly indicate load rating.</p>	<p>Complies</p>
<ul style="list-style-type: none"> <li>Roads that are clearly sign- posted (with easily distinguishable names) and buildings/properties that are clearly numbered.</li> </ul>	<p><b>[16]</b> Public roads greater than 6.5m wide to locate hydrants outside of parking reserves to ensure accessibility to reticulated water for fire suppression.</p> <p><b>[17]</b> Public roads between 6.5m and 8m wide are “<b>No Parking</b>” on one side with the services (hydrants) located on this side to ensure accessibility to reticulated water for fire suppression.</p>	<p>Complies</p> <p>Complies</p>
<ul style="list-style-type: none"> <li>There is clear access to reticulated water supply.</li> </ul>	<p><b>[18]</b> Public roads up to 6.5m wide provide parking within parking bays and locate services outside of the parking bays to ensure accessibility to reticulated water for fire suppression.</p> <p><b>[19]</b> One-way only public access roads are no less than 3.5m wide and provide parking within parking bays and locate services outside of the parking bays to ensure accessibility to reticulated water for fire suppression.</p>	<p>Complies</p> <p>Complies</p>
<ul style="list-style-type: none"> <li>Parking does not obstruct the minimum paved width.</li> </ul>	<p><b>[20]</b> Parking bays are a minimum of 2.6m wide from kerb edge to road pavement. No services or hydrants are located within the parking bays.</p> <p><b>[21]</b> Public roads directly interfacing the bush fire hazard vegetation provide roll top kerbing to the hazard side of the road.</p>	<p>Complies</p> <p>Complies</p>



In relation to *Acceptable Solution 6*, the perimeter road will be at least 8m wide. The non-perimeter roads will have widths complying with Figure 7 of this Report.

In relation to *Acceptable Solution 10*, cul-de-sac heads should be either 24m in diameter, or they shall have a diameter of not less than 17m and "NO PARKING" is to be provided in the cul-de-sac head so that emergency service vehicles can turn in one movement.

### 3.3.3 Property Access Roads

Table 5

<b>ACCESS – PROPERTY ACCESS</b> Intent of measures: to provide safe access to/from the public road system for firefighters providing property protection during a bush fire and for occupants faced with evacuation.		<b>COMPLIES / DOES NOT COMPLY</b>
<b>Performance Criteria</b>	<b>Acceptable solutions</b>	
<b>The intent may be achieved where:</b>		
<ul style="list-style-type: none"> <li>• Access to properties is provided in recognition of the risk to fire fighters and/or evacuating occupants.</li> </ul>	<p><b>[22]</b> At least one alternative property access road is provided for individual dwellings (or groups of dwellings) that are located more than 200m from a public through-road.</p>	<p>Not applicable</p>
<ul style="list-style-type: none"> <li>• The capacity of road surfaces and bridges is sufficient to carry fully loaded firefighting vehicles.</li> </ul>	<p><b>[23]</b> Bridges clearly indicate load rating and pavements and bridges are capable of carrying a load of 15 tonnes.</p>	<p>Not applicable</p>
<ul style="list-style-type: none"> <li>• All weather access is provided.</li> </ul>	<p><b>[24]</b> Roads do not traverse a wetland or other land potentially subject to periodic inundation (other than a flood or storm surge).</p>	<p>Not applicable</p>
<ul style="list-style-type: none"> <li>• Road widths and design enable safe access for vehicles</li> </ul>	<p><b>[25]</b> A minimum carriageway width of 4m for rural-residential areas, rural landholdings or urban areas with a distance of greater than 70m from the nearest hydrant point to the most external part of a proposed building (or footprint).</p> <p><b>[26]</b> In forest, woodland and heath situations, rural property access roads have passing bays every 200m that are 20m long by 2m wide, making a minimum trafficable width of 6m at the passing bay.</p> <p><b>[27]</b> A minimum vertical clearance of 4m to any overhanging obstructions, including tree branches.</p> <p><b>[28]</b> Internal roads for rural properties provide a loop road around any dwelling or incorporate a turning circle with a minimum 12m outer radius.</p>	<p>Not applicable</p> <p>Not applicable</p> <p>Not applicable</p> <p>Not applicable</p>





	[29] Curves have a minimum inner radius of 6m and are minimal in number to allow for rapid access and egress.	Not applicable
	[30] The minimum distance between inner and outer curves is 6m.	Not applicable
	[31] The cross-fall is not more than 10°.	Not applicable
	[32] Maximum grades for sealed roads do not exceed 15° and not more than 10° for unsealed roads.  <i>Note: Some short constrictions in the access may be accepted where they are not less than the minimum (3.5m), extend for no more than 30m and where the obstruction cannot be reasonably avoided or removed. The gradients applicable to public roads also apply to community style development property access roads in addition to the above.</i>	Not applicable
	[33] Access to a development comprising more than 3 dwellings have formalised access by dedication of a road and not by right of way.	Not applicable

In relation to property access roads (driveways), *PBP-2006* provides the following concession for urban areas supplied with a reticulated water supply.

*Note: No specific access requirements apply in a urban area where a 70m unobstructed path can be demonstrated between the most distant external part of the proposed dwelling and the nearest part of the public access road (where the road speed limit is not greater than 70kph) that supports the operational use of emergency firefighting vehicles (i.e. a hydrant or water supply).*

The property access road provisions of *PBP-2006* will not apply to the site. Additionally, the LEP should ensure that future development complies with the guidelines contained in the Fire & Rescue NSW document "*Fire Safety Guideline - Fire Hydrants for Minor Residential Development*".

([http://www.fire.nsw.gov.au/gallery/files/pdf/guidelines/guidelines\\_for\\_minor\\_residential.pdf](http://www.fire.nsw.gov.au/gallery/files/pdf/guidelines/guidelines_for_minor_residential.pdf))

### 3.3.4 Fire Trails

Table 6

ACCESS – FIRE TRAILS Intent of measures: to provide suitable access for fire management purposes and maintenance of APZs.		COMPLIES / DOES NOT COMPLY
Performance Criteria	Acceptable solutions	
The intent may be achieved where:		
<ul style="list-style-type: none"> <li>The width and design of the fire trails enables safe and ready access for firefighting vehicles</li> </ul>	[34] A minimum carriageway width of 4m with an additional 1m wide strip on each side of the trail (clear of bushes and long grass) is provided.	Able to comply
	[35] The trail is a maximum grade of 15° if sealed and not more than 10° if unsealed.	Able to comply



	<p><b>[36]</b> A minimum vertical clearance of 4m to any overhanging obstructions, including tree branches is provided.</p> <p><b>[37]</b> The cross-fall of the trail is not more than 10°.</p> <p><b>[38]</b> The trail has the capacity for passing by:</p> <ul style="list-style-type: none"> <li>- reversing bays using the access to properties to reverse fire tankers, which are 6m wide and 8m deep to any gates, with an inner minimum turning radius of 6m and outer minimum radius of 12m; and/or</li> <li>- a passing bay every 200m, 20m long by 3m wide, making a minimum trafficable width of 7m at the passing bay.</li> </ul> <p><i>Note: Some short constrictions in the access may be accepted where they are not less than the minimum (3.5m) and extend for no more than 30m and where obstruction cannot be reasonably avoided or removed.</i></p>	<p>Able to comply</p> <p>Able to comply</p> <p>Able to comply</p>
<ul style="list-style-type: none"> <li>• Fire trails are trafficable under all weather conditions. Where the fire trail joins a public road, access shall be controlled to prevent use by non authorised persons.</li> </ul>	<p><b>[39]</b> The fire trail is accessible to firefighters and maintained in a serviceable condition by the owner of the land.</p> <p><b>[40]</b> Appropriate drainage and erosion controls are provided.</p> <p><b>[41]</b> The fire trail system is connected to the property access road and/or to the through road system at frequent intervals of 200m or less.</p> <p><b>[42]</b> Fire trails do not traverse a wetlands or other land potentially subject to periodic inundation (other than a flood or storm surge).</p> <p><b>[43]</b> Gates for fire trails are provided and locked with a key/lock system authorized by the local RFS.</p>	<p>Able to comply</p> <p>Able to comply</p> <p>Able to comply</p> <p>Able to comply</p> <p>Able to comply</p>
<ul style="list-style-type: none"> <li>• Fire trails designed to prevent weed infestation, soil erosion and other land degradation.</li> </ul>	<p><b>[44]</b> Fire trail design does not adversely impact on natural hydrological flows.</p> <p><b>[45]</b> Fire trail design acts as an effective barrier to the spread of weeds and nutrients.</p> <p><b>[46]</b> Fire trail construction does not expose acid-sulphate soils.</p>	<p>Able to comply</p> <p>Able to comply</p> <p>Able to comply</p>

No fire trails are proposed. A perimeter road is proposed along the northern and eastern boundary. The hazard to the west of the short length of western boundary is narrow and doesn't justify the construction of a fire trail through these properties.



If the subdivision is to be "Staged", a temporary fire trail should be provided between the development footprint and unmanaged areas unless a properly formed public road is provided as the separation.

### 3.3.5 Utility Services (water, electricity, LPG)

Table 7

<b>SERVICES – WATER, ELECTRICITY, GAS</b> Intent of measures: to provide adequate services of water for the protection of buildings during and after the passage of a bush fire, and to locate gas and electricity so as not to contribute to the risk of fire to a building.		<b>COMPLIES / DOES NOT COMPLY</b>
<b>Performance Criteria</b>	<b>Acceptable solutions</b>	
<b>The intent may be achieved where:</b>		
<b>Reticulated water supplies</b> <ul style="list-style-type: none"> <li>Water supplies are easily accessible and located at regular intervals.</li> </ul>	<p><b>[47]</b> Reticulated water supply to urban subdivisions uses a ring main system for areas with perimeter roads.</p> <p><b>[48]</b> Fire hydrant spacing, sizing and pressures comply with AS2419.1-2005. Where this cannot be met, the RFS will require a test report of the water pressures anticipated by the relevant water supply authority. In such cases, the location, number and sizing of hydrants shall be determined using fire engineering principles.</p> <p><b>[49]</b> Hydrants are not located within any road carriageway.</p> <p><b>[50]</b> All above ground water and gas service pipes external to the building are metal, including and up to any taps.</p> <p><b>[51]</b> The provisions of parking on public roads are met.</p>	<p>Complies</p> <p>Complies</p> <p>Complies</p> <p>Complies</p> <p>Complies</p>
<b>Electricity Services</b> <ul style="list-style-type: none"> <li>Location of electricity services limits the possibility of ignition of surrounding bushland or the fabric of buildings</li> <li>Regular inspection of lines is undertaken to ensure they are not fouled by branches.</li> </ul>	<p><b>[52]</b> Where practicable, electrical transmission lines are underground.</p> <p><b>[53]</b> Where overhead electrical transmission lines are proposed:</p> <ul style="list-style-type: none"> <li>lines are installed with short pole spacing (30m), unless crossing gullies, gorges or riparian areas; and</li> <li>no part of a tree is closer to a power line than the distance set out in accordance with the specifications in 'Vegetation Safety Clearances' issued by Energy Australia (NS179, April 2002).</li> </ul>	<p>Complies</p>



<b>Gas services</b> <ul style="list-style-type: none"> <li>• Location of gas services will not lead to ignition of surrounding bushland or the fabric of buildings</li> </ul>	<b>[54]</b> Reticulated or bottled gas is installed and maintained in accordance with AS1596 and the requirements of relevant authorities. Metal piping is to be used.	Complies
	<b>[55]</b> All fixed gas cylinders are kept clear of all flammable materials to a distance of 10m and shielded on the hazard side of the installation.	Complies
	<b>[56]</b> If gas cylinders need to be kept close to the building, the release valves are directed away from the building and at least 2m away from any combustible material, so that they do not act as a catalyst to combustion. Connections to and from gas cylinders are metal.	Complies
	<b>[57]</b> Polymer sheathed flexible gas supply lines to gas meters adjacent to buildings are not used.	Complies

Fire hydrants should be located within the footpaths / nature strips at intervals not exceeding 90m. An hydraulic analysis should be undertaken to ensure that flow rates and pressures are commensurate with *AS 2419.1-2005 Fire hydrant installations - System design, installation and commissioning* (10 L/s at 150 kPa).

In relation to electricity supplies, the services should be located underground, along with other services such as phone/internet.

All of the *Acceptable Solutions* regarding LPG supplies listed above are able to be addressed at the time of construction of the future dwellings.



## 4.0 SUMMARY / CONCLUSION / RECOMMENDATIONS

This Report assesses the proposed rezoning and eventual subdivision of part of the property known as lot 202//874273, Newmans Road, Woolgoolga.

The proposal has been measured against the criteria listed in the Ministerial Directions 4.4 (Planning for Bushfire Protection) as well as the subdivision provisions of *PBP-2006*. This Report can be used for both purposes, as outlined in the NSW RFS document "*Practice Note 5/12 - Reuse of Rezoning Reports on Bushfire Prone Land*".

The criteria in the Ministerial Directions identify strategic planning goals. These are provided in section 3.1 of this Report. There are matters raised in those sub-sections that should be addressed in the LEP so that unsuitable developments (those that are considered inconsistent with bushfire-prone areas) are prohibited, and the need for additional bushfire assessments for future developments on the site is mostly avoided.

All of the relevant *Acceptable Solutions* contained in 4.1.3 of *PBP-2006* have been, or are able to be, complied with. I recommend the proposal should be approved subject to the following specific recommendations.

1. The LEP should prohibit the undesirable developments, listed in Table 1 of this Report, within the bushfire-prone areas (land within 100m of identified bushfire hazard vegetation) of the subject site.
2. All of the land on the subject site, other than the retained native vegetation located outside of the identified APZs, should have no restriction placed on it that prohibits APZ maintenance. This will include restrictions such as "tree preservation orders" and the like.
3. A Vegetation Management Plan should be prepared for the site. The Vegetation Management Plan should address temporary APZs for Staged development, ongoing management of non-vegetated areas to ensure bushfire hazard vegetation does not regenerate on the site.
4. The LEP should provide a mechanism to ensure the Fire & Rescue NSW document "*Fire Safety Guideline - Fire Hydrants for Minor Residential Development*" is included as a policy for future developments within the site.
5. The consent authority should make a request to the Fire Services Joint Standing Committee (Postal Address: Locked Bag 17, GRANVILLE NSW 2142) to conduct a review of the fire service jurisdictional boundaries associated with the sites.

### 4.1 Limitation

- 6.1.1 This Report and the subsequent recommendations reflect the reasonable and practical efforts of the author. It is important to note that the author (and State and



Local Government authorities) cannot guarantee that bushfire ignition and subsequent bushfire damage will not occur.

- 6.1.2 Current legislation is essentially 'silent' in relation to the maintenance of bushfire protection measures. Maintenance is a major factor in the effectiveness of any BPM provided/installed. The extent to which the BPMs are implemented and maintained will affect the probability of achieving adequate bushfire safety margins.
- 6.1.3 Given the natural phenomenon of bushfires, and limitations in technology and research, a system to guarantee the survival of life and property cannot be made. This is reflected in the following statements of limitations:

*The goal of 'absolute' or '100%' safety is not attainable and there will always be a finite risk of injury, death or property damage. (IFEG-2005)*

*No development in a bushfire prone area can be guaranteed to be entirely safe from bushfires. (PBP-2001)*

*Notwithstanding the precautions adopted, it should always be remembered that bushfires burn under a wide range of conditions and an element of risk, no matter how small, always remains. (PBP-2001)*

**Holiday Coast Bushfire Solutions**  
**Grad. Dip. Design in Bushfire Prone Areas**



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## 5.0 REFERENCES

Fire & Rescue NSW (2016), *Fire hydrants for minor residential development*, Sydney.

NSW Government, *Environmental Planning and Assessment Act 1979* (as amended), <http://www.legislation.nsw.gov.au>

NSW Government, *Rural Fires Act 1997*, <http://www.legislation.nsw.gov.au>

NSW Government, *Rural Fires Regulation 2013*, <http://www.legislation.nsw.gov.au>

NSW Government Geospatial Portal (2017-'18), *various images*, <http://maps.six.nsw.gov.au/>

NSW Rural Fire Service (2006), *Planning for Bushfire Protection 2006 including Addendum Appendix 3*, Sydney.

NSW Rural Fire Service (2001), *Planning for Bushfire Protection 2001*, Sydney.

NSW Rural Fire Service (2005), *Standards for asset protection zones*, Sydney.

NSW Rural Fire Service (2012), *Practice note 4/12 - 'In principle' masterplan agreements in bush fire prone areas*, Sydney.

NSW Rural Fire Service (2012), *Practice note 5/12 - Reuse of rezoning reports on bushfire prone land*, Sydney.

Standards Australia (2009), *Australian Standard 3959-2009 Construction of buildings in bushfire-prone areas*, Sydney.

## 6.0 APPENDICES

Appendix A - Standards for APZs (RFS 2005) and Appendix 5 of *PBP-2006*.

**ECOSURE-2017-47 APPENDIX A**

**STANDARDS FOR ASSET PROTECTION ZONES**

**PLANNING PROPOSAL AND SUBDIVISION CONCEPTS**

**LOT 202 IN DP 874273,  
BARK HUT ROAD & NEWMANS ROAD,  
WOOLGOOLGA.**





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## INTRODUCTION

For thousands of years bush fires have been a natural part of the Australian landscape. They are inevitable and essential, as many Australian plants and animals have adapted to fire as part of their life cycle.

In recent years developments in bushland areas have increased the risk of bush fires harming people and their homes and property. But landowners can significantly reduce the impact of bush fires on their property by identifying and minimising bush fire hazards. There are a number of ways to reduce the level of hazard to your property, but one of the most important is the creation and maintenance of an Asset Protection Zone (APZ).

A well located and maintained APZ should be used in conjunction with other preparations such as good property maintenance, appropriate building materials and developing a family action plan.

## WHAT IS AN ASSET PROTECTION ZONE?

An Asset Protection Zone (APZ) is a fuel reduced area surrounding a built asset or structure. This can include any residential building or major building such as farm and machinery sheds, or industrial, commercial or heritage buildings.

An APZ provides:

- a buffer zone between a bush fire hazard and an asset;
- an area of reduced bush fire fuel that allows suppression of fire;
- an area from which backburning may be conducted; and
- an area which allows emergency services access and provides a relatively safe area for firefighters and home owners to defend their property.

Potential bush fire fuels should be minimised within an APZ. This is so that the vegetation within the planned zone does not provide a path for the transfer of fire to the asset either from the ground level or through the tree canopy.

## WHAT WILL THE APZ DO?

An APZ, if designed correctly and maintained regularly, will reduce the risk of:

- direct flame contact on the asset;
- damage to the built asset from intense radiant heat; and
- ember attack on the asset.

## WHERE SHOULD I PUT AN APZ?

An APZ is located between an asset and a bush fire hazard.

The APZ should be located wholly within your land. You cannot undertake any clearing of vegetation on a neighbour's property, including National Park estate, Crown land or land under the management of your local council, unless you have written approval.

If you believe that the land adjacent to your property is a bush fire hazard and should be part of an APZ, you can have the matter investigated by contacting the NSW Rural Fire Service (RFS).

There are six steps to creating and maintaining an APZ. These are:

1. Determine if an APZ is required;
2. Determine what approvals are required for constructing your APZ;
3. Determine the APZ width required;
4. Determine what hazard reduction method is required to reduce bush fire fuel in your APZ;
5. Take measures to prevent soil erosion in your APZ; and
6. Landscape and regularly monitor in your APZ for fuel regrowth.

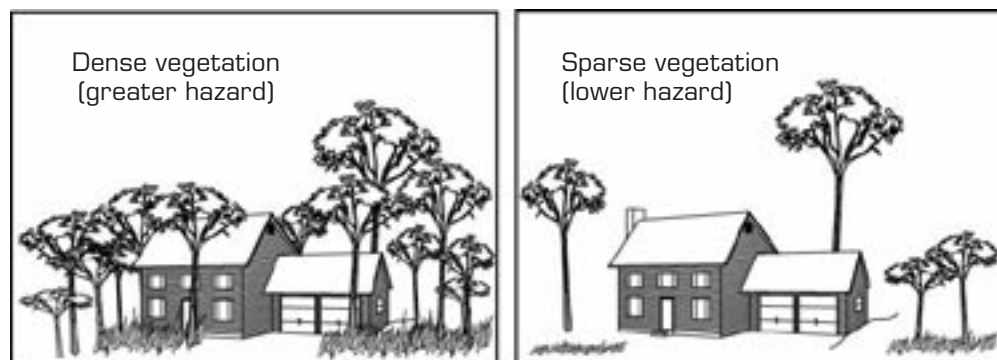
## STEP 1. DETERMINE IF AN APZ IS REQUIRED

Recognising that a bush fire hazard exists is the first step in developing an APZ for your property.

If you have vegetation close to your asset and you live in a bush fire prone or high risk area, you should consider creating and maintaining an APZ.

Generally, the more flammable and dense the vegetation, the greater the hazard will be. However, the hazard potential is also influenced by factors such as slope.

- A large area of continuous vegetation on sloping land may increase the potential bush fire hazard.
- The amount of vegetation around a house will influence the intensity and severity of a bush fire.
- The higher the available fuel the more intense a fire will be.



Isolated areas of vegetation are generally not a bush fire hazard, as they are not large enough to produce fire of an intensity that will threaten dwellings.

This includes:

- bushland areas of less than one hectare that are isolated from large bushland areas; and
- narrow strips of vegetation along road and river corridors.

If you are not sure if there is a bush fire hazard in or around your property, contact your local NSW Rural Fire Service Fire Control Centre or your local council for advice.

## STEP 2. DETERMINE WHAT APPROVALS ARE REQUIRED FOR CONSTRUCTING YOUR APZ

If you intend to undertake bush fire hazard reduction works to create or maintain an APZ you must gain the written consent of the landowner.

### Subdivided land or construction of a new dwelling

If you are constructing an APZ for a new dwelling you will need to comply with the requirements in *Planning for Bushfire Protection*. Any approvals required will have to be obtained as part of the Development Application process.

### Existing asset

If you wish to create or maintain an APZ for an existing structure you may need to obtain an environmental approval. The RFS offers a free environmental assessment and certificate issuing service for essential hazard reduction works. For more information see the RFS document *Application Instructions for a Bush Fire Hazard Reduction Certificate* or contact your local RFS Fire Control Centre to determine if you can use this approval process.

Bear in mind that all work undertaken must be consistent with any existing land management agreements (e.g. a conservation agreement, or property vegetation plan) entered into by the property owner.

If your current development consent provides for an APZ, you do not need further approvals for works that are consistent with this consent.

If you intend to burn off to reduce fuel levels on your property you may also need to obtain a Fire Permit through the RFS or NSW Fire Brigades. See the RFS document *Before You Light That Fire* for an explanation of when a permit is required.

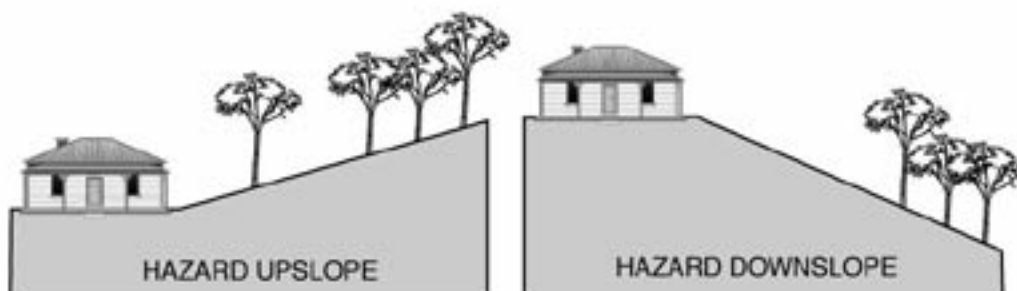
## STEP 3. DETERMINE THE APZ WIDTH

The size of the APZ required around your asset depends on the nature of the asset, the slope of the area, the type and structure of nearby vegetation and whether the vegetation is managed.

Fires burn faster uphill than downhill, so the APZ will need to be larger if the hazard is downslope of the asset.



Gentle slopes require a smaller APZ distance than steep slopes



A hazard downslope will require a greater APZ distance than a hazard upslope of the asset

Different types of vegetation (for example, forests, rainforests, woodlands, grasslands) behave differently during a bush fire. For example, a forest with shrubby understorey is likely to result in a higher intensity fire than a woodland with a grassy understorey and would therefore require a greater APZ width.

A key benefit of an APZ is that it reduces radiant heat and the potential for direct flame contact on homes and other buildings. Residential dwellings require a wider APZ than sheds or stockyards because the dwelling is more likely to be used as a refuge during bush fire.

#### **Subdivided land or construction of a new dwelling**

If you are constructing a new asset, the principles of *Planning for Bushfire Protection* should be applied. Your Development Application approval will detail the exact APZ distance required.

#### **Existing asset**

If you wish to create an APZ around an existing asset and you require environmental approval, the Bush Fire Environmental Assessment Code provides a streamlined assessment process. Your Bush Fire Hazard Reduction Certificate (or alternate environmental approval) will specify the maximum APZ width allowed.

For further information on APZ widths see *Planning for Bushfire Protection* or the *Bush Fire Environmental Assessment Code* (available on the RFS website), or contact your local RFS Fire Control Centre.

## **STEP 4. DETERMINE WHAT HAZARD REDUCTION METHOD IS REQUIRED TO REDUCE BUSH FIRE FUEL IN YOUR APZ**

The intensity of bush fires can be greatly reduced where there is little to no available fuel for burning. In order to control bush fire fuels you can reduce, remove or change the state of the fuel through several means.

Reduction of fuel does not require removal of all vegetation, which would cause environmental damage. Also, trees and plants can provide you with some bush fire protection from strong winds, intense heat and flying embers (by filtering embers) and changing wind patterns. Some ground cover is also needed to prevent soil erosion.

#### **Fuels can be controlled by:**

##### **1. raking or manual removal of fine fuels**

Ground fuels such as fallen leaves, twigs (less than 6 mm in diameter) and bark should be removed on a regular basis. This is fuel that burns quickly and increases the intensity of a fire.

Fine fuels can be removed by hand or with tools such as rakes, hoes and shovels.

##### **2. mowing or grazing of grass**

Grass needs to be kept short and, where possible, green.

##### **3. removal or pruning of trees, shrubs and understorey**

The control of existing vegetation involves both selective fuel reduction (removal, thinning and pruning) and the retention of vegetation.

Prune or remove trees so that you do not have a continuous tree canopy leading from the hazard to the asset. Separate tree crowns by two to five metres. A canopy should not overhang within two to five metres of a dwelling.

Native trees and shrubs should be retained as clumps or islands and should maintain a covering of no more than 20% of the area.

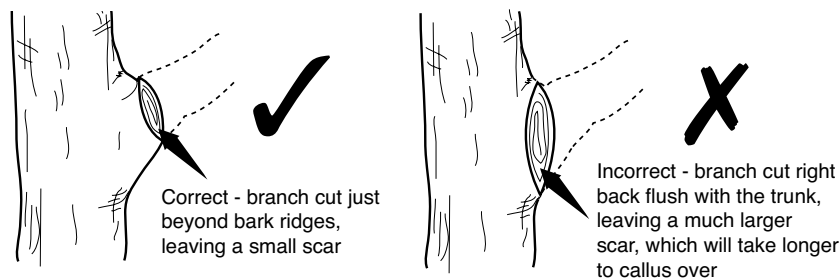
When choosing plants for removal, the following basic rules should be followed:

1. Remove noxious and environmental weeds first. Your local council can provide you with a list of environmental weeds or 'undesirable species'. Alternatively, a list of noxious weeds can be obtained at [www.agric.nsw.gov.au/noxweed/](http://www.agric.nsw.gov.au/noxweed/);
2. Remove more flammable species such as those with rough, flaky or stringy bark; and
3. Remove or thin understory plants, trees and shrubs less than three metres in height

The removal of significant native species should be avoided.

Prune in accordance with the following standards:

- Use sharp tools. These will enable clean cuts and will minimise damage to the tree.
- Decide which branches are to be removed before commencing work. Ensure that you maintain a balanced, natural distribution of foliage and branches.
- Remove only what is necessary.
- Cut branches just beyond bark ridges, leaving a small scar.
- Remove smaller branches and deadwood first.



There are three primary methods of pruning trees in APZs:

#### 1. Crown lifting (skirting)

Remove the lowest branches (up to two metres from the ground). Crown lifting may inhibit the transfer of fire between the ground fuel and the tree canopy.

#### 2. Thinning

Remove smaller secondary branches whilst retaining the main structural branches of the tree. Thinning may minimise the intensity of a fire.

#### 3. Selective pruning

Remove branches that are specifically identified as creating a bush fire hazard (such as those overhanging assets or those which create a continuous tree canopy). Selective pruning can be used to prevent direct flame contact between trees and assets.

Your Bush Fire Hazard Reduction Certificate or local council may restrict the amount or method of pruning allowed in your APZ.

See the *Australian Standard 4373 (Pruning of Amenity Trees)* for more information on tree pruning.

#### 4. Slashing and trittering

Slashing and trittering are economical methods of fuel reduction for large APZs that have good access. However, these methods may leave large amounts of slashed fuels (grass clippings etc) which, when dry, may become a fire hazard. For slashing or trittering to be effective, the cut material must be removed or allowed to decompose well before summer starts.

If clippings are removed, dispose of them in a green waste bin if available or compost on site (dumping clippings in the bush is illegal and it increases the bush fire hazard on your or your neighbour's property).

Although slashing and trittering are effective in inhibiting the growth of weeds, it is preferable that weeds are completely removed.

Care must be taken not to leave sharp stakes and stumps that may be a safety hazard.

## **5. Ploughing and grading**

Ploughing and grading can produce effective firebreaks. However, in areas where this method is applied, frequent maintenance may be required to minimise the potential for erosion. Loose soil from ploughed or graded ground may erode in steep areas, particularly where there is high rainfall and strong winds.

## **6. Burning (hazard reduction burning)**

Hazard reduction burning is a method of removing ground litter and fine fuels by fire. Hazard reduction burning of vegetation is often used by land management agencies for broad area bush fire control, or to provide a fuel reduced buffer around urban areas.

Any hazard reduction burning, including pile burns, must be planned carefully and carried out with extreme caution under correct weather conditions. Otherwise there is a real danger that the fire will become out of control. More bush fires result from escaped burning off work than from any other single cause.

**It is YOUR responsibility to contain any fire lit on your property. If the fire escapes your property boundaries you may be liable for the damage it causes.**

Hazard reduction burns must therefore be carefully planned to ensure that they are safe, controlled, effective and environmentally sound. There are many factors that need to be considered in a burn plan. These include smoke control, scorch height, frequency of burning and cut off points (or control lines) for the fire. For further information see the RFS document *Standards for Low Intensity Bush Fire Hazard Reduction Burning*, or contact your local RFS for advice.

## **7. Burning (pile burning)**

In some cases, where fuel removal is impractical due to the terrain, or where material cannot be disposed of by the normal garbage collection or composted on site, you may use pile burning to dispose of material that has been removed in creating or maintaining an APZ.

For further information on pile burning, see the RFS document *Standards for Pile Burning*.

In areas where smoke regulations control burning in the open, you will need to obtain a Bush Fire Hazard Reduction Certificate or written approval from Council for burning. During the bush fire danger period a Fire Permit will also be required. See the RFS document *Before You Light that Fire* for further details.



## STEP 5. TAKE MEASURES TO PREVENT SOIL EROSION

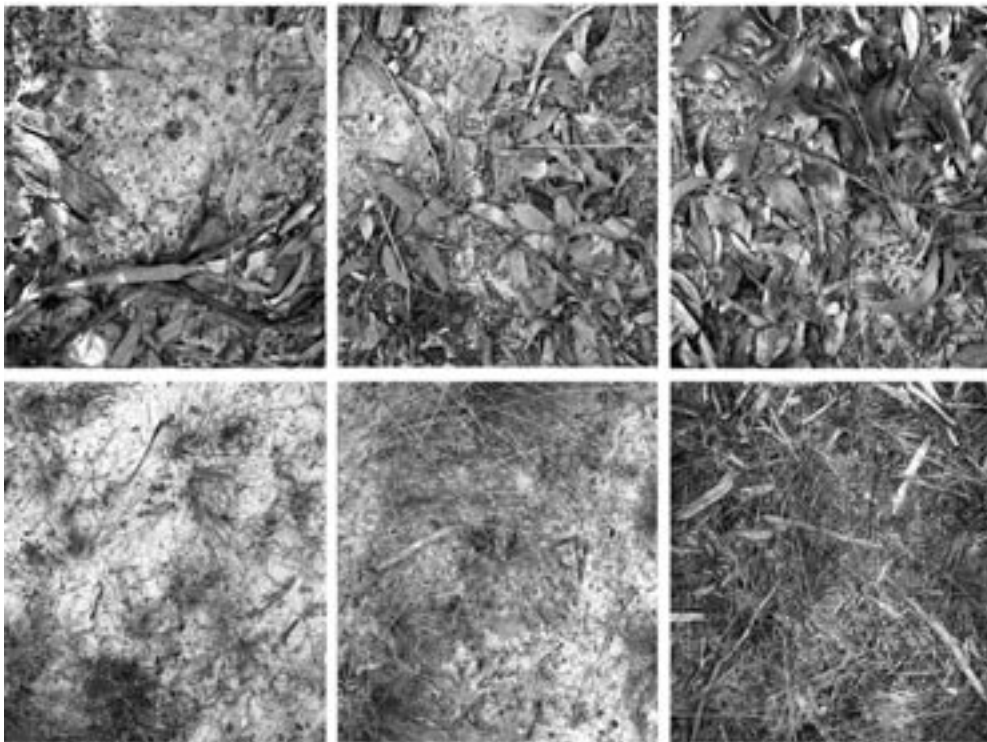
While the removal of fuel is necessary to reduce a bush fire hazard, you also need to consider soil stability, particularly on sloping areas.

Soil erosion can greatly reduce the quality of your land through:

- loss of top soil, nutrients, vegetation and seeds
- reduced soil structure, stability and quality
- blocking and polluting water courses and drainage lines

A small amount of ground cover can greatly improve soil stability and does not constitute a significant bush fire hazard. Ground cover includes any material which directly covers the soil surface such as vegetation, twigs, leaf litter, clippings or rocks. A permanent ground cover should be established (for example, short grass). This will provide an area that is easy to maintain and prevent soil erosion.

When using mechanical hazard reduction methods, you should retain a ground cover of at least 75% to prevent soil erosion. However, if your area is particularly susceptible to soil erosion, your Hazard Reduction Certificate may require that 90% ground cover be retained.



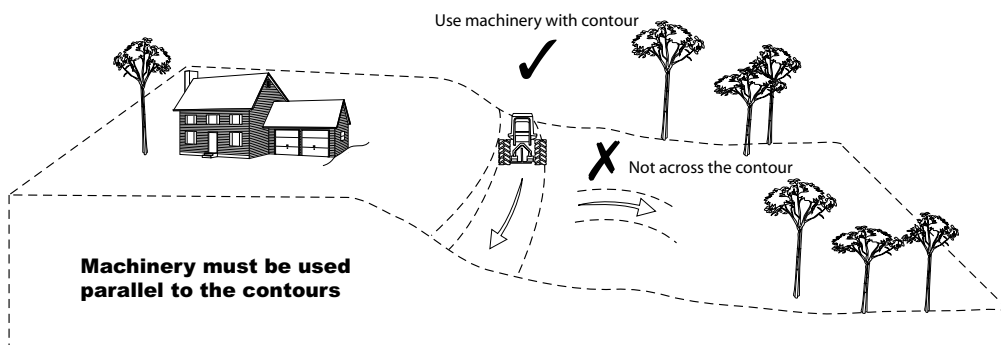
50%

75%

100%

Ground Cover

To reduce the incidence of soil erosion caused by the use of heavy machinery such as ploughs, dozers and graders, machinery must be used parallel to the contours. Vegetation should be allowed to regenerate, but be managed to maintain a low fuel load.



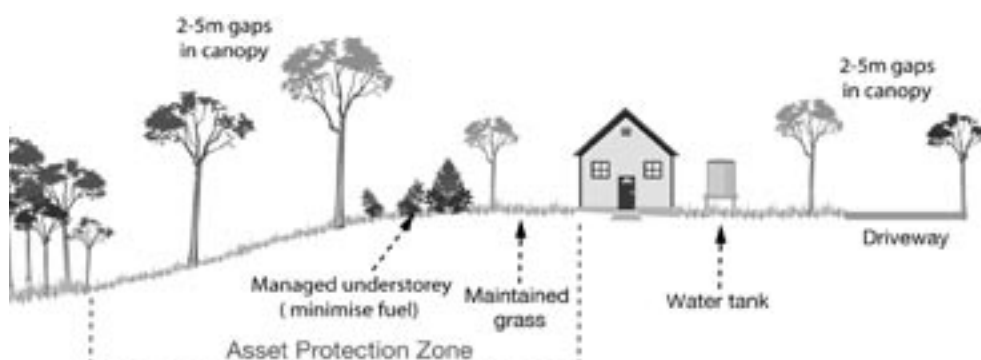
## STEP 6. ONGOING MANAGEMENT AND LANDSCAPING

Your home and garden can blend with the natural environment and be landscaped to minimise the impact of fire at the same time. To provide an effective APZ, you need to plan the layout of your garden to include features such as fire resistant plants, radiant heat barriers and windbreaks.

### Layout of gardens in an APZ

When creating and maintaining a garden that is part of an APZ you should:

- ensure that vegetation does not provide a continuous path to the house;
- remove all noxious and environmental weeds;
- plant or clear vegetation into clumps rather than continuous rows;
- prune low branches two metres from the ground to prevent a ground fire from spreading into trees;
- locate vegetation far enough away from the asset so that plants will not ignite the asset by direct flame contact or radiant heat emission;
- plant and maintain short green grass around the house as this will slow the fire and reduce fire intensity. Alternatively, provide non-flammable pathways directly around the dwelling;
- ensure that shrubs and other plants do not directly abut the dwelling. Where this does occur, gardens should contain low-flammability plants and non flammable ground cover such as pebbles and crush tile; and
- avoid erecting brush type fencing and planting “pencil pine” type trees next to buildings, as these are highly flammable.



### Removal of other materials

Woodpiles, wooden sheds, combustible material, storage areas, large quantities of garden mulch, stacked flammable building materials etc. should be located away from the house. These items should preferably be located in a designated cleared location with no direct contact with bush fire hazard vegetation.

### Other protective features

You can also take advantage of existing or proposed protective features such as fire trails, gravel paths, rows of trees, dams, creeks, swimming pools, tennis courts and vegetable gardens as part of the property's APZ.

## PLANTS FOR BUSH FIRE PRONE GARDENS

When designing your garden it is important to consider the type of plant species and their flammability as well as their placement and arrangement.

Given the right conditions, all plants will burn. However, some plants are less flammable than others.

Trees with loose, fibrous or stringy bark should be avoided. These trees can easily ignite and encourage the ground fire to spread up to, and then through, the crown of the trees.

- Plants that are less flammable, have the following features:
- high moisture content
  - high levels of salt
  - low volatile oil content of leaves
  - smooth barks without “ribbons” hanging from branches or trunks; and
  - dense crown and elevated branches.

When choosing less flammable plants, be sure not to introduce noxious or environmental weed species into your garden that can cause greater long-term environmental damage.

For further information on appropriate plant species for your locality, contact your local council, plant nurseries or plant society.

If you require information on how to care for fire damaged trees, refer to the Firewise brochure *Trees and Fire Resistance; Regeneration and care of fire damaged trees*.

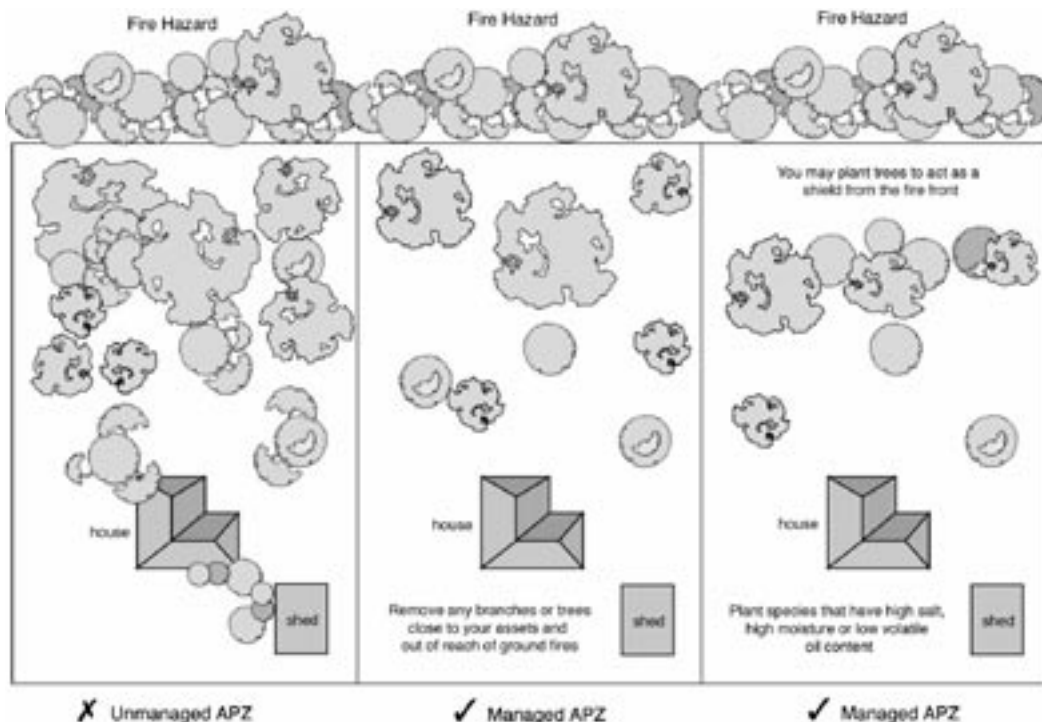
## WIND BREAKS

Rows of trees can provide a wind break to trap embers and flying debris that could otherwise reach the house or asset.

You need to be aware of local wind conditions associated with bush fires and position the wind break accordingly. Your local RFS Fire Control Centre can provide you with further advice.

When choosing trees and shrubs, make sure you seek advice as to their maximum height. Their height may vary depending on location of planting and local conditions. As a general rule, plant trees at the same distance away from the asset as their maximum height.

When creating a wind break, remember that the object is to slow the wind and to catch embers rather than trying to block the wind. In trying to block the wind, turbulence is created on both sides of the wind break making fire behaviour erratic.



## HOW CAN I FIND OUT MORE?

The following documents are available from your local Fire Control Centre and from the NSW RFS website at [www.rfs.nsw.gov.au](http://www.rfs.nsw.gov.au).

- Before You Light That Fire
- Standards for Low Intensity Bush Fire Hazard Reduction Burning
- Standards for Pile Burning
- Application Instructions for a Bush Fire Hazard Reduction Certificate

If you require any further information please contact:

- your local NSW Rural Fire Service Fire Control Centre. Location details are available on the RFS website or
- call the NSW RFS Enquiry Line 1800 679 737 (Monday to Friday, 9am to 5pm), or
- the NSW RFS website at [www.rfs.nsw.gov.au](http://www.rfs.nsw.gov.au).

**Produced by the NSW Rural Fire Service, Locked Mail Bag 17,  
GRANVILLE, NSW 2142. Ph. 1800 679 737**

[www.rfs.nsw.gov.au](http://www.rfs.nsw.gov.au)

## Appendix 5

# Bush Fire Provisions - Landscaping and Property Maintenance

### A5.1 Introduction

Bush fires are a natural and periodic event in the Australian landscape. Many Australian plants and animals have adapted to fire over thousands of years and require fire as part of their life cycle.

However, development adjacent to bushland areas has increased the risk of fire impacting on people and their assets. Fire management needs to strike a balance between the protection of life and property and the maintenance of ecological processes and systems.

In Australia, bush fires are inevitable and an essential aspect of the landscape.

However, the impact on property and life can be reduced with responsible preparation and management of bush fire hazards. This is the responsibility of all land managers, as well as communities and individuals taking responsibility for their own fire safety.

The level of protection for life or whether or not a house or other assets survive a bush fire ultimately depends on the landowner and their level of preparedness against bush fire attack.

The planning system can be used to better effect in protecting human life, property and environmental values from the impacts of bush fire events.

In some cases this will involve land use planning and development controls, construction standards, APZs and subdivision layout, siting, design and provision of services. It also involves careful and deliberate consideration of the environmental impacts of these and how we can recognise the need to protect our wetlands, rainforests, koala habitat and other biodiversity and cultural values.

However, the best planning can be undone by poor maintenance and lack of forethought when landscaping a development. Therefore house survival ultimately depends on the householder.

Some maintenance also depends upon adjoining neighbours and upon fuel management in adjacent bush land areas by the owners, occupiers or managers of that land. General housekeeping and maintenance of the grounds by the householder is equally important and, in some cases, may even be more so.

Experience from the Canberra 2003 fires suggests that house losses are greatest in the area up to 250 metres from the bush interface. Distances of

less than 100 metres are particularly vulnerable to flame contact, radiant heat and ember attack.

Hence it is within this distance that efforts should be made to prepare for the onslaught of major bush fire events.

While other legislation provides the impetus for planning objectives, the RF Act provides the legislative vehicle to achieve bush fire management objectives.

In this appendix consideration will be given to the principles for landscaping and management, and the role of property maintenance during the fire event.

### A5.2 Principles of Protection

Bush fire attack takes essentially five forms;

- wind,
- smoke,
- ember,
- radiant heat and
- flame.

Evidence indicates ember attack is responsible for most bush fire related house fires. Strong winds resulting from severe bush fires will drive embers into vulnerable areas of a building, preheat and dry fuel ahead of a fire, lift roofing and extend flames along a more horizontal plane closer to building elements. Embers can also cause spotting in advance of the bush fire and provide piloted ignition to building elements. To effectively protect a building, strategies must be implemented that separate it from the hazard and reduce the intensity of bush fires to minimise the combined impact of ember, wind, flame and heat attack.

While smoke will cause minimal damage to property, it can severely affect the health of residents. Smoke is a significant factor in areas in which aged or disabled persons reside – hospitals and nursing homes - and more so where residents are susceptible to respiratory disorders.

Radiant heat (measured in kW/m<sup>2</sup>) can severely impair firefighting operations, the health of residents and the integrity of building elements. Radiant heat in excess of 10kW/m<sup>2</sup> can prevent emergency services personnel assisting residents of SFPP developments.

Flame attack will severely restrict firefighting operations, provide piloted ignition to building elements and threaten the health of residents and their capacity to evacuate the area.

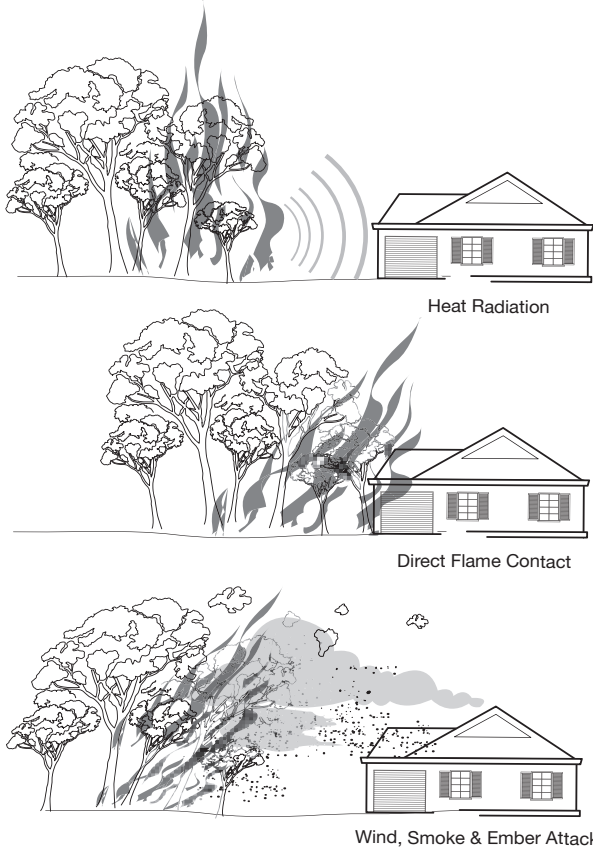


Figure A 5.1 Bush Fire Attack Mechanisms

Overall the intention of bush fire protection measures should be to prevent flame contact to a structure, reduce radiant heat to below the ignition thresholds for various elements of a building, to minimise the potential for wind driven embers to cause ignition and reduce the effects of smoke on residents and firefighters.

### A5.3 Principles of Landscaping Properties for Bush Fire Protection

The principles of landscaping for bush fire protection aim to:

- Prevent flame impingement on the dwelling;
- Provide a defendable space for property protection;
- Reduce fire spread;
- Deflect and filter embers;
- Provide shelter from radiant heat; and
- Reduce wind speed.

#### (a) Vegetation choices

All vegetative material can burn under the influence of bush fire.

With this in mind, careful attention must be paid to species selection, their location relative to their flammability, avoidance of continuity of vegetation (horizontally and vertically), and ongoing maintenance to readily remove flammable fuels (leaf litter, twigs and debris).

In the paper “*Landscape and Building Design for Bushfire Areas*” G.C. Ramsay and L. Rudolph have provided 14 attributes of vegetation which affect bush fire attack. In summary these attributes are:

- Moisture content of leaves;
- Volatile oil content of leaves;
- Mineral content of leaves;
- Leaf fineness;
- Density of foliage;
- Continuity of plant form;
- Height of lowest foliage above ground;
- Size of plant;
- Dead foliage on the plant;
- Bark texture;
- Quantity of ground fuels;
- Fineness of ground fuels;
- Compaction ability of ground fuels; and
- Mineral content of ground fuel.

What is clear is that the higher moisture content of leaves (mesic), the less bark that will be available and the lower the leaf drop, all of which will assist with maintenance of the understorey and will also assist in reducing bush fire attack.

Work in the USA and elsewhere has also suggested that in addition to removal of understorey species, the trimming of lower limbs of trees also assists in reducing fire penetration into the canopy. Trees such as ‘pencil pines’ and African olive have been attributed with high fire propagation due to the high fine fuel and/or oil content captured within the canopy. This leads to significant flame height. Avoid such species in favour of rainforest species such as Figs and Syzygium.

When choosing plants, be sure not to introduce weed species into an area. Fire events may provide the opportunity for weed species to spread and may contribute fuel to an area of otherwise lower fuel loads.

Contact local councils, plant nurseries and plant societies to determine suitable species for your area.

#### (b) Trees as Windbreaks

The use of trees as windbreaks is a common practice but trees also provide a useful function, trapping embers and flying debris, which would otherwise reach the house. The tree crown will rarely carry fire unless there is a significant fuel loading on the ground.

By reducing the wind speed, a row of trees also slows the rate of spread of a bush fire and a dense foliage traps radiant heat, lowering bush fire radiant heat.

Because of the effect of turbulence, a balance has to be struck between a high density of trees (that

maximises the trapping of embers and radiant heat but also maximises turbulence) and a lower density (that allows more embers and radiant heat to pass through but minimises turbulence). A windbreak that allows 30–60% of the wind to pass through is ideal as less than this becomes too solid with ember laden winds being carried over the top of the break.

To be effective a windbreak must:

- be located on the side of the lot from which fire weather normally approaches;
- be of sufficient length (generally 100 metres minimum length);
- be located at a distance of one to three times the height of fully grown trees but not within the IPA;
- use smooth barked eucalypts, rainforest trees or deciduous trees;
- make sure there are no breaks of sufficient size to allow winds to funnel through; and
- be separated by sufficient distance from the hazard so as not to be consumed and become a hazard itself.

#### A5.4 Vegetation Management

Where APZs have been incorporated as part of the development approval for subdivision or for dwelling construction, the environmental aspects of the development should have already been taken into account.

In general, it is expected that APZs will be maintained by the owner of the land including maintenance of any fire trail constructed as part of the development.

It is accepted practice that after construction of a dwelling, gardens will be established and landscaping of the grounds will be undertaken. It is essential that efforts to reduce fuels on adjoining properties are therefore not negated by actions within the immediate curtilage of the building.

In terms of priorities of addressing bush fire attack, priority should be given to preventing flame impingement by not allowing fine debris to accumulate close to the building. Secondly, removal of understorey fuels aids in the reduction of flame heights and likely canopy fire, thereby reducing overall radiant heat. Removal of loose bark and fine fuels reduces both heat output and ember generation, while the retention of taller trees with canopies will also assist in filtering out embers.

To maintain a garden that does not contribute to the spread of bush fires, it is necessary to plan the layout of the garden beds and take an active decision to minimise certain features in favour of other features. These should include:

- maintaining a clear area of low cut lawn or pavement adjacent to the house;
- keeping areas under fences, fence posts and

- gates and trees raked and cleared of fuel;
- utilising non-combustible fencing and retaining walls
- breaking up the canopy of trees and shrubs with defined garden beds;
- organic mulch should not be used in bush fire prone areas and non flammable material should be used as ground cover, eg Scoria, pebbles, recycled crushed bricks.
- planting trees and shrubs such that:
  - the branches will not overhang the roof;
  - the tree canopy is not continuous; and
  - there is a windbreak in the direction from which fires are likely to approach.

The RFS has developed its document “Standards for Asset Protection Zones” which should be consulted for APZ specifications. This is also available on the RFS web page at [www.rfs.nsw.gov.au](http://www.rfs.nsw.gov.au).

#### A5.5 Maintenance of Property

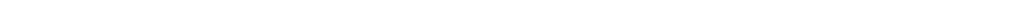
Sensible arrangements for landscaping and maintenance of the property are critical in the prevention of losses.

In considering property maintenance the following items should therefore be implemented in advance of the bush fire season:

- removal of material such as litter from the roof and gutters;
- ensure painted surfaces are in good condition with decaying timbers being given particular attention to prevent the lodging of embers within gaps;
- check pumps and water supplies are available and in working order;
- driveways are in good condition with trees not being too close and forming an obstacle during smoky conditions;
- check tiles and roof lines for broken tiles or dislodged roofing materials;
- screens on windows and doors are in good condition without breaks or holes in flyscreen material and frames are well fitting into sills and window frames;
- drenching or spray systems are regularly tested before the commencement of the fire season;
- hoses and hose reels are not perished and fittings are tight and in good order;
- doors are fitted with draught seals and well maintained;
- mats are of non combustible material or in areas of low potential exposure; and
- woodpiles, garden sheds and other combustible materials are located downslope and well away from the house.

Trees and other vegetation in the vicinity of power lines and tower lines should be managed and trimmed in accordance with the specifications in “Vegetation Safety Clearances” issued by Energy Australia (NS179, April 2002).

# Appendix G ~ Engineering Report





**Engineering Appraisal**

For

Part Lot 202 DP 874273

**Newmans Road Woolgoolga**

September 2018



**de Groot & Benson Pty Ltd**

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## INTRODUCTION

de Groot & Benson Pty Ltd has been engaged by Keiley Hunter Town Planning Pty Ltd to prepare a Development Appraisal for a parcel of land at Newmans Road, Woolgoolga, NSW.

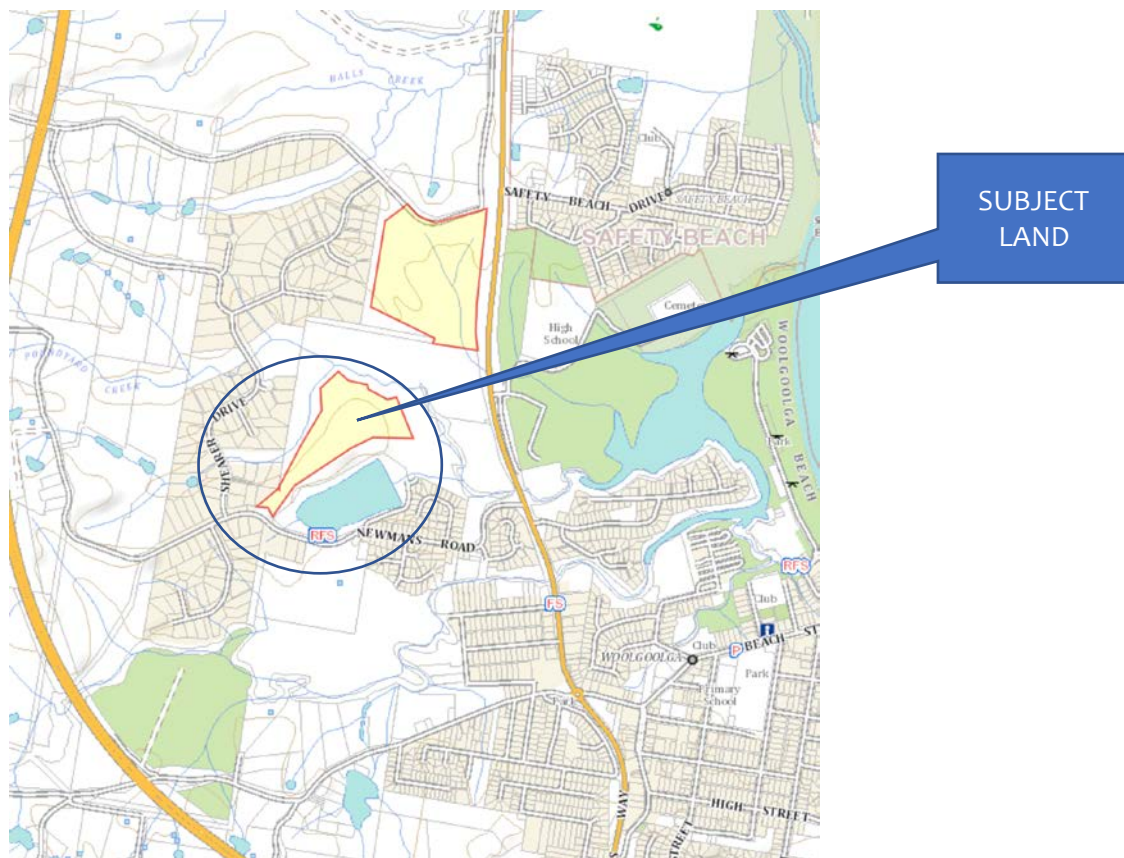
The cadastral description of the subject site is Part Lot 202 DP 874273 and the property is located within the local government area of Coffs Harbour City Council.

The purpose of this report is to provide preliminary information on the development potential of this allotment.

### 1.1 Existing Site

The subject site consists of two segments of land documented as the one parcel of land, as is identified below in Figure 1.

*Figure 1: Site Locality and Extents*



The area of the subject land is 9.229 ha. The site consists of moderately undulating grassland, with some scattered trees. The site is located on a knoll, and as such the land falls away from the top of the feature. Elevation of the site varies from approximately RL 9.5m AHD, to around RL 38.0 m AHD. Surface slope is relatively moderate, typically around 10%, with isolated areas getting as steep as 25% and as flat as 1%. At present there are no dwellings on the site.



## **1.2 Zoning**

The land is currently zoned RU2 – Rural Landscape, with the northern and southern parts of Lot 202 being separated by RE1 - public recreation land.

It is proposed by the applicant that this land be rezoned as R2 – Low Density Residential, to allow subdivision down to a minimum of 400 m<sup>2</sup> lot area.

Such zoning would be consistent with neighbouring properties, which are generally residential developments of various densities.

## **2 CONCEPT LAYOUT**

### **2.1 Layout Drawings**

In order to aid in determining the feasibility of the proposal, a concept subdivision layout has been prepared indicating that the potential lot yield is 80 to 90 low density lots of around 600 m<sup>2</sup> or greater. The concept layout took into consideration standard engineering and planning practices, in order to produce a good indication of the likely resemblance of a residential subdivision of the property.

## **3 INFRASTRUCTURE**

### **3.1 Water and Sewerage**

The site falls within the areas proposed for service of Coffs Harbour Water – the arm of Council which provides this infrastructure.

Preliminary investigations with Coffs Harbour City Council indicate that adequate water is available to the site from mains located in neighbouring developments.

A similar story applies for sewerage, with adequate treatment capacity available at Woolgoolga Sewage Treatment Plant. Augmentations however may be required for the transfer system from the site to the Treatment Plant, but this normally is the responsibility of Council.

It is expected that the sewerage from the entirety of the site can be drained by gravity to a single new sewage pump station located in the reserve which runs between the two portions of the site. From there rising mains would convey the sewage to existing Council systems leading to the Woolgoolga Sewage Treatment Plant.

### **3.2 Energy and Telecommunications**



No approaches have been made to Essential Energy or telecommunication service providers, but supply is not expected to pose any constraint to development.

Neighbouring properties are occupied by residential developments of various densities and as such are supplied with Energy and Telecommunication services.

Therefore, servicing any new developments should be a relatively simple undertaking.

### **3.3 Access**

Access to the land is via Newmans Road. Newmans Road is a sealed public road, 6m in width, and connects to Solitary Islands Way, to the east of the site.

As part of the development of the site, new AC sealed roads would be constructed to convey traffic throughout the subdivision.

## **4 POTENTIAL CONSTRAINTS**

### **4.1 Flooding**

Almost the entirety of the site is situated outside Council's Flood Planning Area, with only a very small portion at the southern boundary of the northern section of Lot 202 (not part of the subject land) noted as flood prone on Council mapping.

The land has adequate fall to efficiently convey stormwater runoff, via piped systems as well as designated overland flow paths, and thusly the risk of flooding of future residences is reduced.

In light of the above, it can be concluded that flooding concerns will not be a constraint to this rezoning.

### **4.2 Acid Sulfate Soils**

Coffs Harbour City Council Mapping shows that practically the entirety of the site is classified as Class 5 Acid Sulfate Soils, which is the lowest possible risk class.

Therefore, it is highly unlikely that development of the property into residential lots will disturb acid sulphate soils (ASS).

### **4.3 Contaminated Lands – Banana Cultivation**

Council mapping shows that none of the site has been used for banana cultivation, and as such land contamination is not considered to be an issue for this proposal.



#### 4.4 Landform

As was previously mentioned, the whole site has land slopes less than 25%. This being the case, landform does not impose any impediment to urban development. Generally, the landform is suitable for the full range of urban development, right down to 400 m<sup>2</sup> allotments.

The elevation range of the site (approximately RL 9.5m AHD to RL 38.0m AHD) will allow for normal development of the property.

As a matter of good civil engineering practice, residential allotments will not be placed in natural drainage paths (gullies), but instead roads should be used as safe overland drainage channels, as is shown on drawing 04253 – SK1 to 04253 – SK3.

#### 4.5 Geotechnical Considerations

From our general knowledge of the area, we do not expect any geotechnical factors will be limiting to the construction of dwellings and civil infrastructure.

#### 4.6 Bush Fire Considerations

In planning the development, consideration will need to be given to the “Planning for Bushfires Guidelines” as set out by the New South Wales Rural Fire Service.

Coffs Harbour City Council mapping shows that some Category 1 and Category 2 vegetation does surround the site, and in some cases protrudes into the subject land.

In determining lot yields, we have placed perimeter roads around the concept subdivision where adjacent properties have significant vegetation. These perimeter roads will allow space for bushfire asset protection zones (APZ).

Final lot yields will be informed by a bushfire report.

### 5 DEVELOPMENT CONSTRAINT ANALYSIS

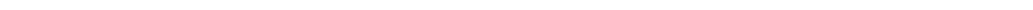
Listed below is a brief constraint analysis for the site:

ITEM	Comment
<ul style="list-style-type: none"> <li>Zoning</li> </ul>	Provided the land is appropriately re-zoned, zoning of the land is not envisaged to be a constraint to development.
<ul style="list-style-type: none"> <li>Infrastructure</li> </ul>	As discussed in Section 3, water, sewerage, power and telephone services are not expected to be a constraint for development.
<ul style="list-style-type: none"> <li>Flooding</li> </ul>	The site has sufficient elevation and fall to ensure that flooding will not be an issue for the development, as is discussed in Section 4.1.



• Acid Sulfate Soils	Minimal or no acid sulphate soils are expected to be disturbed by the development of the site.
• Geotechnical	Geotechnical issues are not expected to be any constraint on development.
• Slope	The site is generally less than 20% and therefore slope should not be a constraint to any development.
• Chemical Contamination	No chemical contamination is expected to be present on the site.
• Bushfire	With the proper use of APZs, bushfire concerns will not prove to be a constraint to the development of this site.

# Appendix H ~ Traffic Impact Assessment







## **ADDENDUM -**

## **TRAFFIC IMPACT ASSESSMENT**

(ADDRESSING COUNCIL INFORMATION REQUEST  
DATED OCTOBER 2018)

PROPOSED RESIDENTIAL ESTATE

92 NEWMANS ROAD AND 36A BARK HUT ROAD,  
WOOLGOOLGA

Prepared for

**SUNDERPAL SODHI**

**25 OCTOBER 2018**

## DOCUMENT REGISTER


Document                   Bark Hut Road Rezoning  
Traffic Impact Assessment (TIA)

RTG Reference            17274

Date                        25 October 2018

Prepared by              Dare Janzekovic, Luke Rytenskild

### Document History

Version	Version date	Details	Reviewed and Authorised	
			Name / Position	Signature
1	25 October 2018	DA Submission	Luke Rytenskild Director RPEQ 6293	

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## 1.0 INTRODUCTION

Rytenskild Traffic Engineering (RTE) has been engaged by Sunderpal Sodhi to review the traffic impacts of its proposed Residential Subdivision at Woolgoolga.

This is an addendum to the Traffic Impact Assessment dated 13<sup>th</sup> September, 2018 and responds to matters raised by Council. In accordance with Council's request, the traffic analysis presented in this report has been adjusted to allow for:

- the potential traffic generation of other future development along Newmans Road ;
- a more conservative distribution of development traffic along Newmans Road and at the Solitary Islands Way intersection ;
- a higher background traffic growth rate for through traffic on Solitary Island Ways ;
- a 20 year design horizon (year 2040) ;
- an assessment of various upgrade options for the Solitary Islands Way / Newmans Road intersection.

## 2.0 REVISED DESIGN TRAFFIC CALCULATIONS

### 2.1 Background Traffic Volumes

Background traffic volumes have been estimated by applying a 2% per annum growth rate to through traffic volumes on Solitary Islands Way. A design horizon has been set at the year 2040, with the commencement year assumed to be 2020. It is noted that the surveyed turning movement volumes shown in the GHD report dated 15<sup>th</sup> November 2015 are marginally higher than those surveyed by RTE in February 2018. To be conservative, the GHD volumes have been adopted, along with the through traffic volumes on Solitary Islands Way, provided to RTE by Council.

### 2.2 Traffic Generated by Other Future Development

Traffic generation estimates have been applied for the following future development areas along Newmans Road :

- West Woolgoolga Development Control Plan (DCP) – 139 lots ;
- Approved Manufactured Home Park to the south of Macintosh Crescent (196 sites).

It is noted that the GHD traffic report dated 15<sup>th</sup> November 2015 allowed for the following development in the above areas :

- West Woolgoolga Development Control Plan (DCP) – 139 lots ;
- Approved DA (45 lots and 92 x Seniors Living Dwellings).

A trip generation of 75 vehicles per hour was adopted for the approved development. The current proposal will have a similar generation of 78 vehicles per hour (i.e. 196 sites x 0.4 trips). On this

basis, the trip generation outlined in the GHD report has been assumed for both the DCP and approved DA.

### 2.3 Proposed Development Traffic

It has been assumed that all traffic generated by the southern precinct will use Newmans Road to access Solitary Island Way. Trip generation estimates as outlined in the Traffic Impact Assessment are provided below:

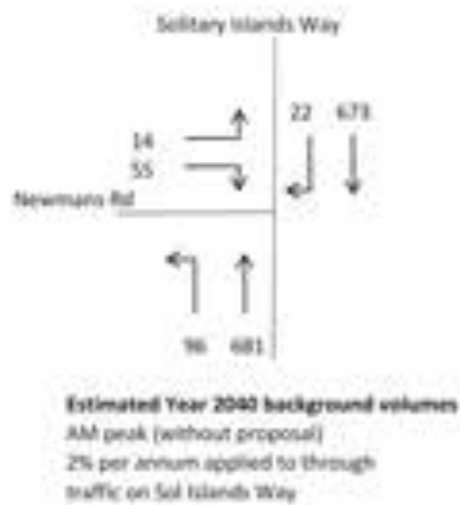
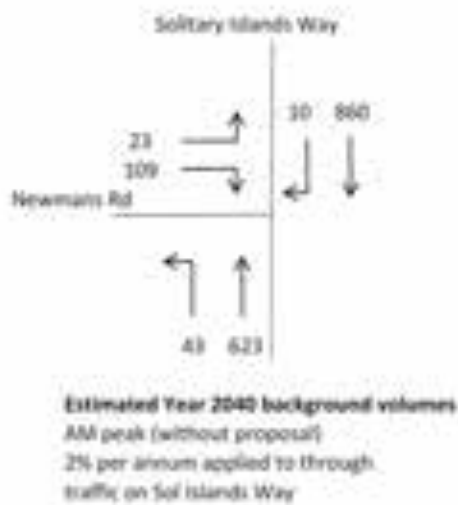
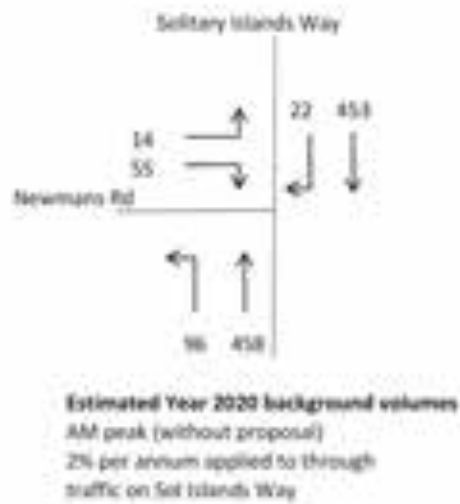
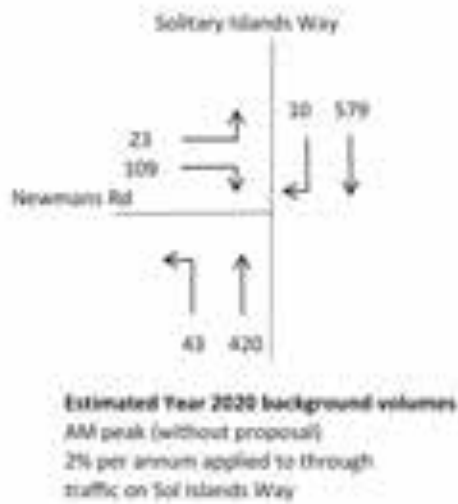
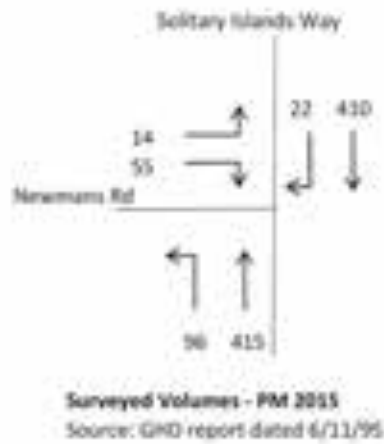
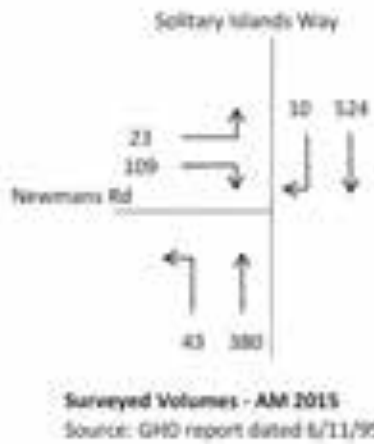
**Table 5.1 - Estimated Development Traffic Generation (Proposed southern precinct)**

Component	Morning Peak Hour			Afternoon Peak Hour		
	In	Out	Total	In	Out	Total
Southern precinct (94 lots):	15	61	<b>76</b>	45	31	<b>76</b>

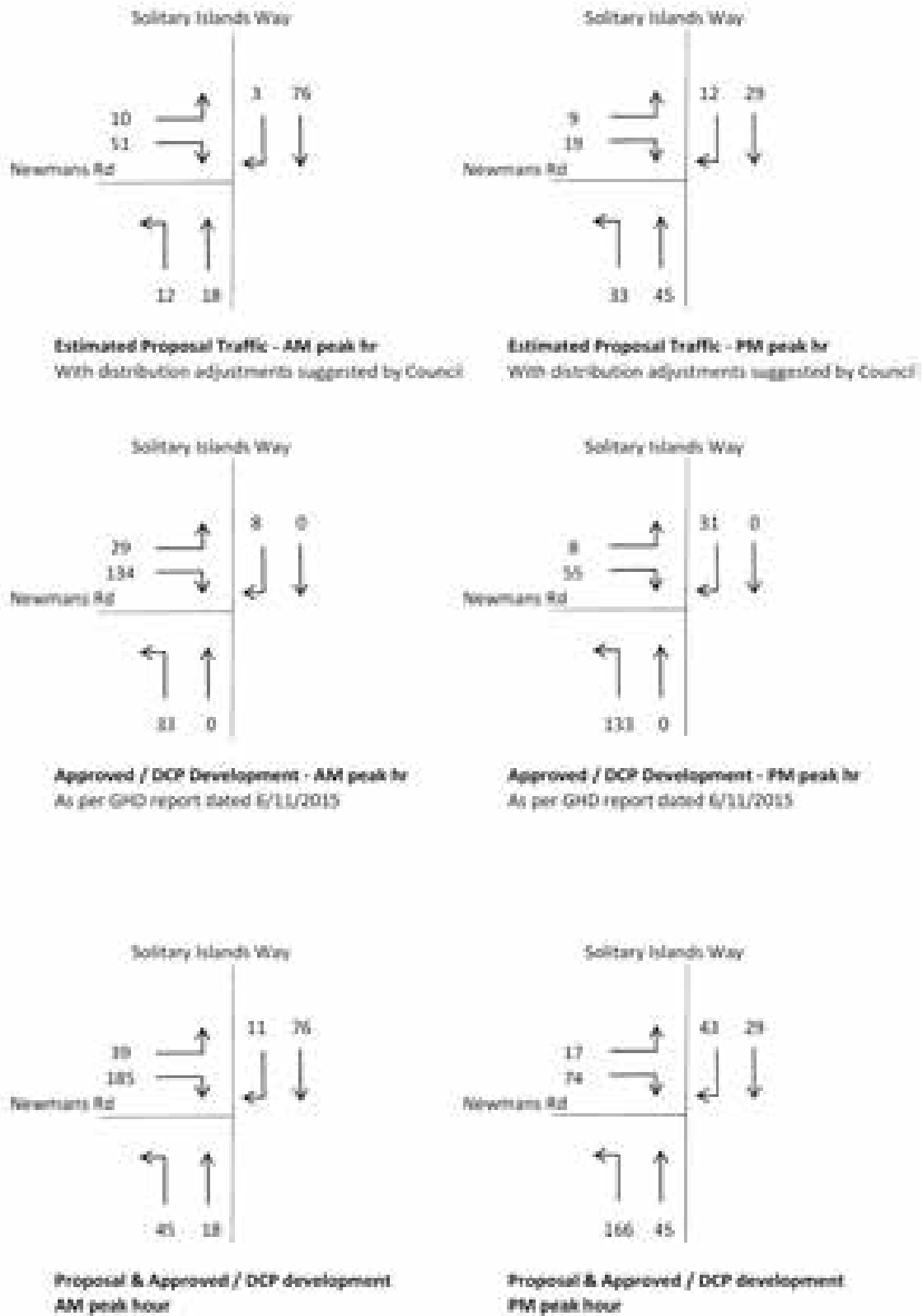
Peak Hour Distribution: AM – 20 /80, PM – 60 / 40

### 2.4 Design Traffic Volumes

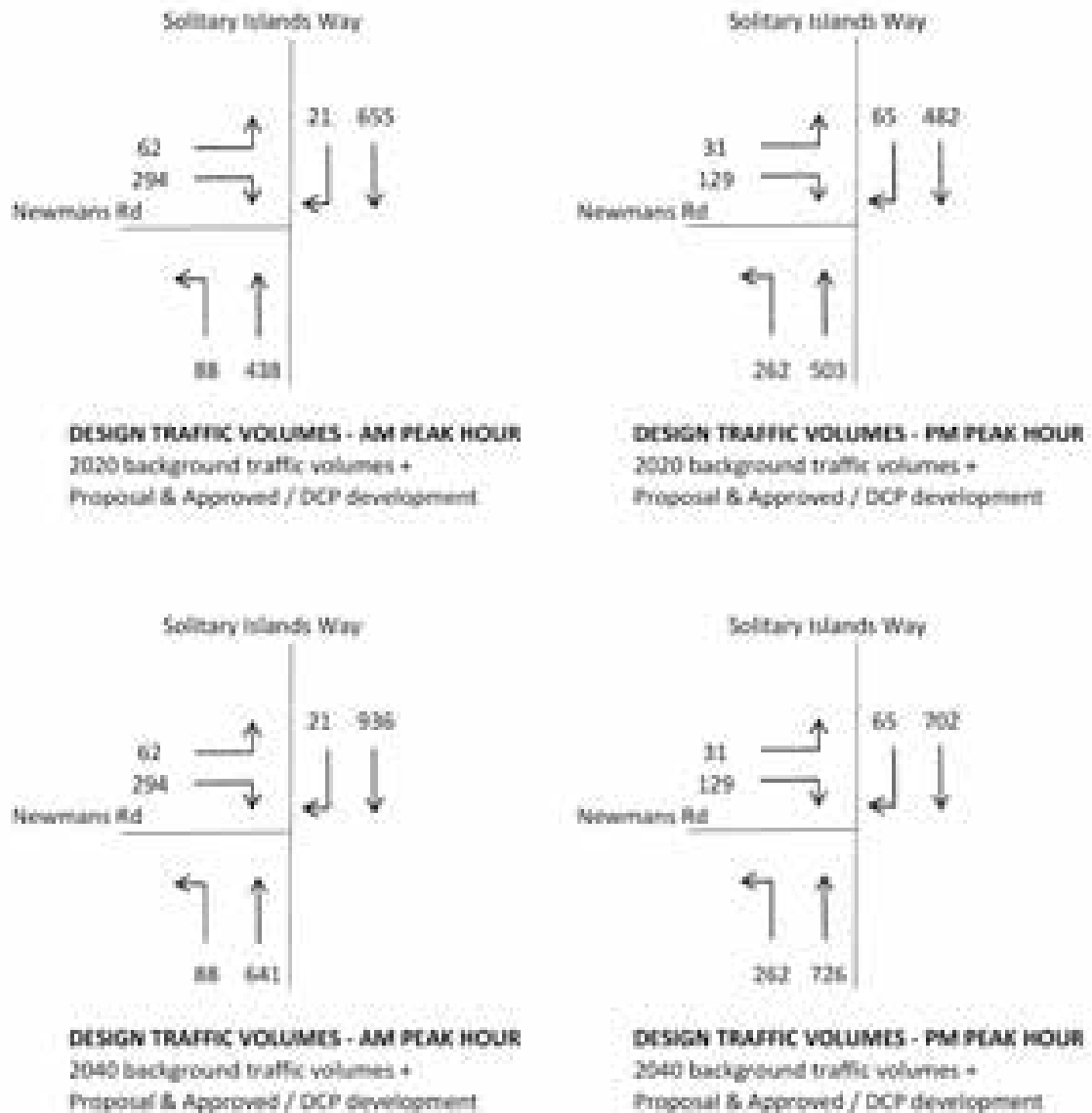
The design traffic volumes equate to the summation of the above traffic estimates for the commencement year and the year 2040. The traffic volume estimates are shown in Figures 2.1 and 2.2, with the design volumes shown in Figure 2.3.



**FIGURE 2.1 – BACKGROUND TRAFFIC VOLUME ESTIMATES FOR THE SOLITARY ISLANDS WAY / NEWMANS RD INTERSECTION**



**FIGURE 2.2 – ESTIMATED TRAFFIC VOLUMES AT THE SOLITARY ISLANDS WAY / NEWMANS ROAD INTERSECTION (GENERATED BY THE PROPOSAL AND OTHER PLANNED DEVELOPMENT ALONG NEWMANS ROAD)**



**FIGURE 2.3 – DESIGN PEAK HOUR TRAFFIC VOLUMES (2020 AND 2040) AT THE SOLITARY ISLANDS WAY / NEWMANS ROAD INTERSECTION**



### 3.0 SOLITARY ISLANDS WAY / NEWMANS ROAD INTERSECTION

#### 3.1 Existing Intersection Layout

The results of the SIDRA analysis are presented in Appendix C and summarised below in Table 3.1. The criteria for evaluating the SIDRA results is presented in Appendix B.

**Table 3.1: SIDRA Results (Solitary Islands Way / Newmans Road intersection)**

Scenario	Degree of Saturation	Level of Service*	Total Average Delay (seconds)	Queue Length (metres)
2020 AM Peak – design traffic	1.024	F	26.4	204
2020 PM Peak – design traffic	0.44	C	3.1	13.1

The SIDRA output is provided in Attachment B.

As shown in the original Traffic Impact Assessment, the existing Solitary Islands Way / Newmans Road intersection is currently performing satisfactorily. However, as shown above in Table 3.1, the intersection would fail with the Newmans Road catchment fully developed (i.e. the proposal, the approved manufacturing home park, and the west Woolgoolga DCP completed). As shown, the intersection would fail during the morning peak hour which is the critical period for the right turn movement from Newmans Road to the south.

#### 3.2 Future Upgrade Requirements

Further traffic modelling has been carried out to test the performance of the following intersection controls:

- Roundabout;
- Traffic signals.

As shown in Table 3.2, a roundabout option has been modelled using an inside island diameter of 20 metres. It is noted that the GHD report from November 2015 assumed a 10 metre diameter, however it is considered that such would not be appropriate for a major road such as Solitary Islands Way. As shown in Table 3.2, a single lane roundabout would approach capacity during the year 2020 morning peak hour, assuming the full development of the Newmans Road catchment. This option would not be suitable for the ultimate design horizon (2040).

A sensitivity analysis has been carried out for a double lane roundabout layout. As shown in Table 3.2, a double lane roundabout would perform satisfactorily for ultimate traffic conditions.

**Table 3.2: SIDRA Results (Solitary Islands Way / Newmans Road – single lane roundabout)**

Scenario	Degree of Saturation	Level of Service*	Total Average Delay (seconds)	Queue Length (metres)
2020 AM Peak – design traffic	0.702	A	8.0	64
2020 PM Peak – design traffic	0.569	A	5.8	42
2040 AM Peak – design traffic	0.989	C	21.0	314
2040 PM Peak – design traffic	0.729	A	6.0	77
Sensitivity – 2040 AM Peak – design traffic	0.524	A	6.6	34
Sensitivity – 2040 PM Peak – design traffic	0.487	A	5.5	32

The SIDRA output is provided in Attachment C.

The traffic modelling indicates that the signalised layout tested by GHD would fail during the short – medium term, as there would be excessive queuing on Solitary Islands Way, in each direction. Further modelling indicates that a signalised layout would need to include a second short through lane in each direction on Solitary Islands Way. As shown below, this layout would perform satisfactorily under year 2040 peak traffic periods. The modelled intersection layout is shown in Appendix D.

**Table 3.3: SIDRA Results (Solitary Islands Way / Newmans Road – traffic signals)**

Scenario	Degree of Saturation	Level of Service*	Total Average Delay (seconds)	Queue Length (metres)
2040 AM Peak – design traffic	1.079	F	110.4	869
2040 PM Peak – design traffic	0.888	C	31.1	309
Sensitivity – 2040 AM Peak – design traffic	0.867	D	37.4	206.9
Sensitivity – 2040 PM Peak – design traffic	0.757	C	26.2	105.9

The SIDRA output is provided in Attachment D.

It appears that the requires signalised layout may not be practical given constraints associated with the bridge just to the north of the intersection. However, as shown in Figure 3.1., it may be possible to achieve the double lane roundabout layout without impacting upon the bridge. Detailed investigations of each option should be carried out by Council.



**FIGURE 3.1 – CONCEPT SKETCH OF DOUBLE LANE ROUNDABOUT**

---

#### **4.0 SUMMARY OF CONCLUSIONS & RECOMMENDATIONS**

- Further traffic modelling has been carried out which allows for other planned development in Newmans Road and also a design horizon at the year 2040. The analysis also allows more conservative assumptions with respect to background traffic growth and trip distribution.
- The traffic modelling indicates that the Solitary Islands Way / Newmans Road intersection would need to be upgraded to a roundabout or traffic signal control in the medium term future, as the Newmans Road catchment develops.
- The modelling indicates that a roundabout would need to comprise of two circulating lanes, with a double approach lane on each Solitary Islands Way approach.
- A signalised layout would need to comprise of a second short through lane in each direction on Solitary Islands Way in order to accommodate ultimate queuing demands. It may not be practical to achieve this layout due to constraints associated with the bridge located just to the north of Newmans Road.

## APPENDICES

APPENDIX A – CRITERIA FOR EVALUATING SIDRA RESULTS

APPENDIX B – DETAILED SIDRA RESULTS

## APPENDIX A – CRITERIA FOR EVALUATING SIDRA RESULTS

### 1. Level of Service (LOS)

LOS	Traffic Signals and Roundabouts	Give Way and Stop Signs
'A'		Good operation.
'B'	Good operation.	Acceptable delays and spare capacity.
'C'	Good with acceptable delays and spare capacity.	Satisfactory but accident study required.
'D'	Satisfactory.	Near capacity and accident study required.
'E'	Operating near capacity.	At capacity and requires other control mode.
'F'	At capacity; at signals incidents will cause excessive delays. Roundabouts require other control mode.	Unsatisfactory and requires other control mode.
'F'	Unsatisfactory and requires additional capacity.	Unsatisfactory and requires other control mode.

### 2. Average Vehicle Delay (AVD)

The AVD provides a measure of the operational performance of an intersection as indicated on the table below which relates AVD to LOS. The AVD's listed in the table should be taken as a guide only as longer delays could be tolerated in some locations (i.e. inner city conditions) and on some roads (i.e. minor side street intersecting with a major arterial route).

Level of Service	Average Delay per Vehicle (secs/veh)	Traffic Signals, Roundabout	Give Way and Stop Signs
A	less than 14	Good operation.	Good operation.
B	15 to 28	Good with acceptable delays and spare capacity.	Acceptable delays and spare capacity.
C	29 to 42	Satisfactory.	Satisfactory but accident study required.
D	43 to 56	Operating near capacity.	Near capacity and accident study required.
E	57 to 70	At capacity; at signals incidents will cause excessive delays. Roundabouts require other control mode.	At capacity and requires other control mode.

### 3. Degree of Saturation (DS)

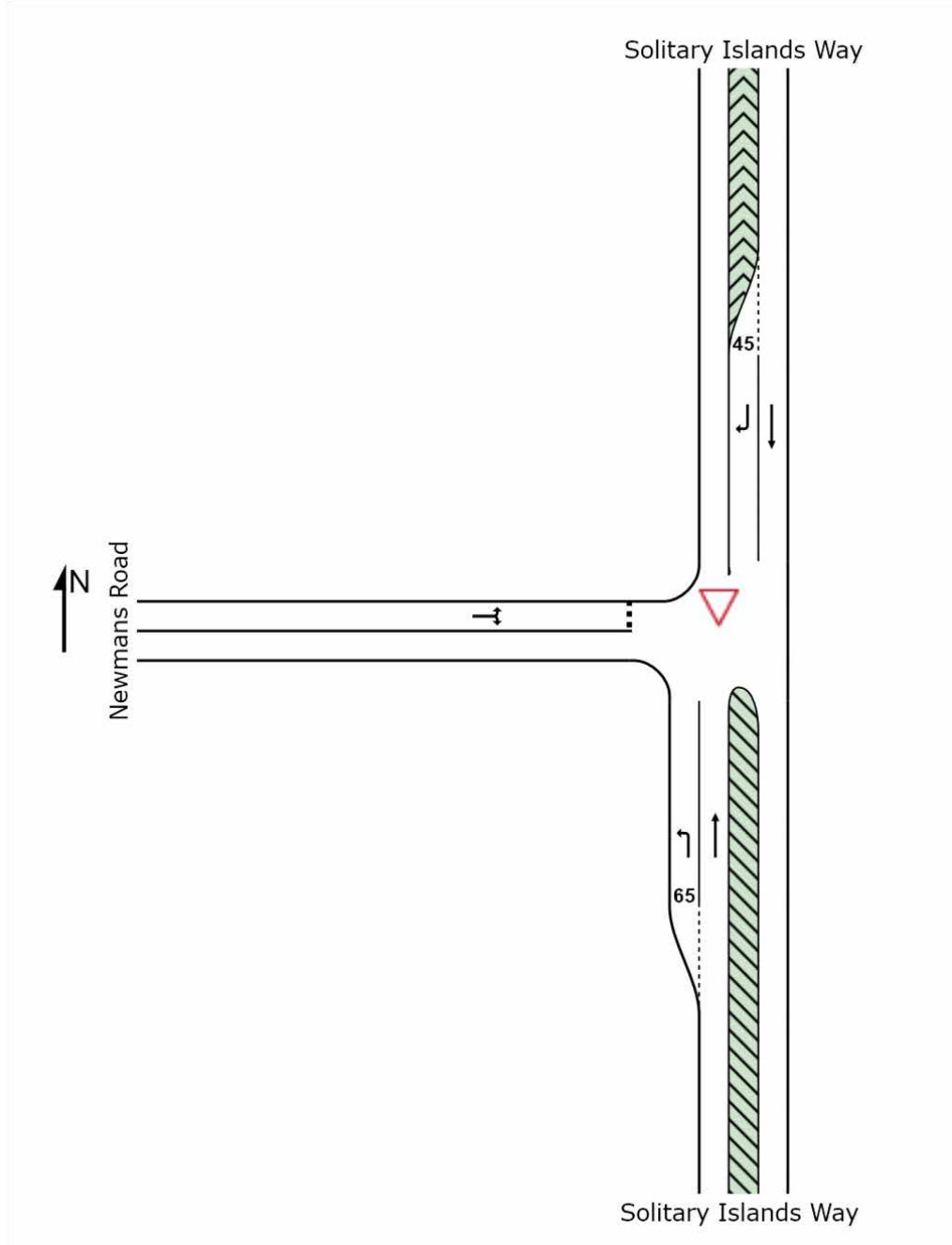
The DS is another measure of the operational performance of individual intersections.

For intersections controlled by **traffic signals**<sup>1</sup> both queue length and delay increase rapidly as DS approaches 1, and it is usual to attempt to keep DS to less than 0.9. Values of DS in the order of 0.7 generally represent satisfactory intersection operation. When DS exceeds 0.9 queues can be anticipated.

For intersections controlled by a **roundabout or GIVE WAY or STOP signs**, satisfactory intersection operation is indicated by a DS of 0.8 or less.

<sup>1</sup>The values of DS for intersections under traffic signal control are only valid for cycle length of 120 secs.

APPENDIX B – SIDRA RESULTS (EXISTING SOL ISLANDS WAY / NEWMANS RD)



YEAR 2020 – WITH NEWMANS ROAD FULLY DEVELOPED

**MOVEMENT SUMMARY**

**Site: 2020 AM Peak - DESIGN**

17274 - Newmans Road / Solitary Islands Way Intersection  
 Sensitivity model - no traffic to west  
 One-way / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	Dir	Volume (veh/h)	Sat. (veh/h)	Delay (sec)	Average Delay (sec)	Level of Service	95% Peak Hour Delay (veh)	95% Peak Hour Delay (sec)	Stop Control	Operational Delay (veh)	Average Delay (sec)
<b>South Solitary Islands Way</b>											
1	L2	44	1.0	0.049	0.8	LOS-A	0.0	0.0	0.00	0.00	44.0
2	T1	418	10.0	0.208	0.0	LOS-A	0.0	0.0	0.00	0.00	58.8
Approach		508	9.2	0.208	1.0	NA	0.0	0.0	0.00	0.00	58.8
<b>North Solitary Islands Way</b>											
8	T1	420	10.0	0.208	0.0	LOS-A	0.0	0.0	0.00	0.00	58.8
9	R2	21	0.0	0.001	7.7	LOS-A	0.1	0.8	0.00	0.00	44.0
Approach		676	9.8	0.208	0.3	NA	0.1	0.8	0.00	0.00	58.8
<b>West Newmans Road</b>											
10	L2	62	0.0	1.024	100.0	LOS-F	27.8	200.8	1.00	3.27	11.2
12	R2	204	0.0	1.024	110.2	LOS-F	27.8	203.8	1.00	3.27	11.2
Approach		306	0.0	1.024	110.0	LOS-F	27.8	203.8	1.00	3.27	11.2
All Vehicles		758	0.1	1.024	28.4	NA	27.8	203.8	0.24	0.79	58.8

**MOVEMENT SUMMARY**

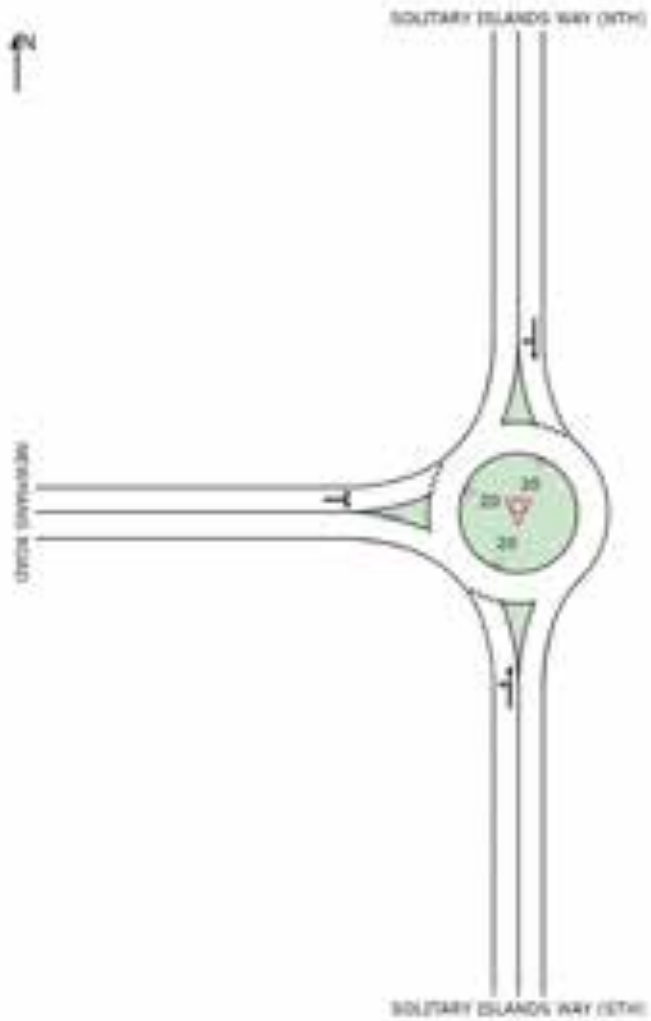
**Site: 2020 PM Peak - DESIGN**

17274 - Newmans Road / Solitary Islands Way Intersection  
 Sensitivity model - no traffic to west  
 One-way / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	Dir	Volume (veh/h)	Sat. (veh/h)	Delay (sec)	Average Delay (sec)	Level of Service	95% Peak Hour Delay (veh)	95% Peak Hour Delay (sec)	Stop Control	Operational Delay (veh)	Average Delay (sec)
<b>South Solitary Islands Way</b>											
1	L2	262	2.0	0.146	0.8	LOS-A	0.0	0.0	0.00	0.07	44.0
2	T1	500	10.0	0.275	0.0	LOS-A	0.0	0.0	0.00	0.00	58.8
Approach		760	8.0	0.275	1.0	NA	0.0	0.0	0.00	0.07	57.1
<b>North Solitary Islands Way</b>											
8	T1	480	10.0	0.260	0.0	LOS-A	0.0	0.0	0.00	0.00	58.8
9	R2	89	0.0	0.087	8.3	LOS-A	0.4	2.8	0.00	0.01	44.1
Approach		547	9.8	0.260	1.2	NA	0.4	2.8	0.07	0.10	58.8
<b>West Newmans Road</b>											
10	L2	81	0.0	0.440	7.3	LOS-A	1.0	13.1	0.79	0.00	36.4
12	R2	126	0.0	0.440	18.3	LOS-C	1.0	13.1	0.79	0.00	36.4
Approach		180	0.0	0.440	18.8	LOS-B	1.0	13.1	0.79	0.00	36.4
All Vehicles		1472	0.1	0.440	3.1	NA	1.0	13.1	0.11	0.20	58.8



APPENDIX C – SIDRA RESULTS (SOL ISLANDS WAY / NEWMANS RD – SINGLE LANE ROUNDABOUT)



YEAR 2020 – WITH NEWMANS ROAD FULLY DEVELOPED

**MOVEMENT SUMMARY**

 Site: 2020 AM Peak DESIGN roundabout

Solitary Islands Way / Newmans Rd, Woodbridge Roundabout

Movement Performance - Vehicles											
Mov ID	CC	Flow (veh/h)	Control Type	Flow (veh/h)	Priority	Level of Service	95th Percentile Delay (s)	95th Percentile Queue Length (m)	Stop Control	Control Type	Flow (veh/h)
<b>North SOLITARY ISLANDS WAY (S14)</b>											
1	L2	99	S-0	0.992	4.0	L0B-A	3.1	23.0	0.17	0.40	54.6
2	T1	461	S-0	0.962	4.0	L0B-A	3.1	23.0	0.17	0.40	55.6
Approach		560	S-0	0.962	4.0	L0B-A	3.1	23.0	0.17	0.40	55.2
<b>North SOLITARY ISLANDS WAY (S15)</b>											
3	T1	689	S-0	0.752	6.0	L0B-A	6.4	64.1	0.84	0.82	52.0
4	R2	22	S-0	0.752	10.4	L0B-B	6.4	64.1	0.84	0.82	52.0
Approach		712	S-0	0.752	6.1	L0B-A	6.4	64.1	0.84	0.82	52.0
<b>West NEWMANS ROAD</b>											
10	L2	65	S-0	0.498	7.2	L0B-A	3.8	19.1	0.68	0.79	50.2
12	R2	300	S-0	0.498	10.1	L0B-B	3.8	19.1	0.68	0.79	51.2
Approach		375	S-0	0.498	10.2	L0B-B	3.8	19.1	0.68	0.79	51.0
All Vehicles		1640	S-0	0.752	6.0	L0B-A	6.4	64.1	0.84	0.82	52.0

**MOVEMENT SUMMARY**

 Site: 2020 PM Peak DESIGN single roundabout

Solitary Islands Way / Newmans Rd, Woodbridge Roundabout

Movement Performance - Vehicles											
Mov ID	CC	Flow (veh/h)	Control Type	Flow (veh/h)	Priority	Level of Service	95th Percentile Delay (s)	95th Percentile Queue Length (m)	Stop Control	Control Type	Flow (veh/h)
<b>North SOLITARY ISLANDS WAY (S14)</b>											
1	L2	278	S-0	0.988	4.0	L0B-A	3.8	41.7	0.38	0.44	53.8
2	T1	529	S-0	0.988	4.0	L0B-A	3.8	41.7	0.38	0.44	55.0
Approach		807	S-0	0.988	4.1	L0B-A	3.8	41.7	0.38	0.44	54.8
<b>North SOLITARY ISLANDS WAY (S15)</b>											
3	T1	507	S-0	0.465	6.2	L0B-A	3.8	28.8	0.48	0.52	54.0
4	R2	48	S-0	0.465	9.7	L0B-A	3.8	28.8	0.48	0.52	54.0
Approach		579	S-0	0.465	9.7	L0B-A	3.8	28.8	0.48	0.52	54.0
<b>West NEWMANS ROAD</b>											
10	L2	33	S-0	0.198	7.2	L0B-A	1.2	8.8	0.68	0.76	50.2
12	R2	136	S-0	0.198	10.0	L0B-B	1.2	8.8	0.68	0.76	51.2
Approach		169	S-0	0.198	10.1	L0B-B	1.2	8.8	0.68	0.76	51.1
All Vehicles		1045	S-0	0.505	6.0	L0B-A	3.8	41.7	0.44	0.51	54.0

YEAR 2040 – WITH NEWMANS ROAD FULLY DEVELOPED

**MOVEMENT SUMMARY**

**Site: 2040 AM Peak DESIGN single roundabout**

Solitary Islands Way / Newmans Rd, Woolgoolga Roundabout

Movement Performance - Vehicles											
Move No.	CD Area	Design Flow (veh/h)	Design Flow (pc/h)	Cap. (veh/h)	Average Delay (sec)	Level of Service	95th Peak Hour Percentile Delay (sec)	95th Peak Hour Percentile Delay (pc)	Peak Delay (sec)	Effective Delay (sec/veh)	Average Speed (km/h)
<b>South SOLITARY ISLANDS WAY (PTV)</b>											
1	L2	93	5.0	0.498	4.1	LOS A	5.0	40.1	0.21	0.20	54.4
2	T1	973	10.0	0.498	9.3	LOS A	3.3	40.1	0.21	0.20	50.7
Approach		1067	5.4	0.498	4.3	LOS A	3.3	40.1	0.21	0.20	50.9
<b>North SOLITARY ISLANDS WAY (PTV)</b>											
6	T1	949	10.0	0.498	36.3	LOS D	41.3	313.8	1.09	1.09	38.3
8	R2	30	3.0	0.498	40.4	LOS D	41.3	313.8	1.09	1.09	38.3
Approach		1007	5.8	0.498	36.1	LOS D	41.3	313.8	1.09	1.09	38.3
<b>West NEWMANS ROAD</b>											
10	L2	48	5.0	0.498	16.7	LOS B	3.8	29.3	0.82	0.95	48.0
12	R2	309	3.0	0.498	15.5	LOS B	3.8	29.3	0.82	0.95	49.0
Approach		375	5.0	0.498	14.7	LOS B	3.8	29.3	0.82	0.95	48.8
All Vehicles		2149	5.0	0.498	21.0	LOS C	41.3	313.8	0.89	1.05	44.9

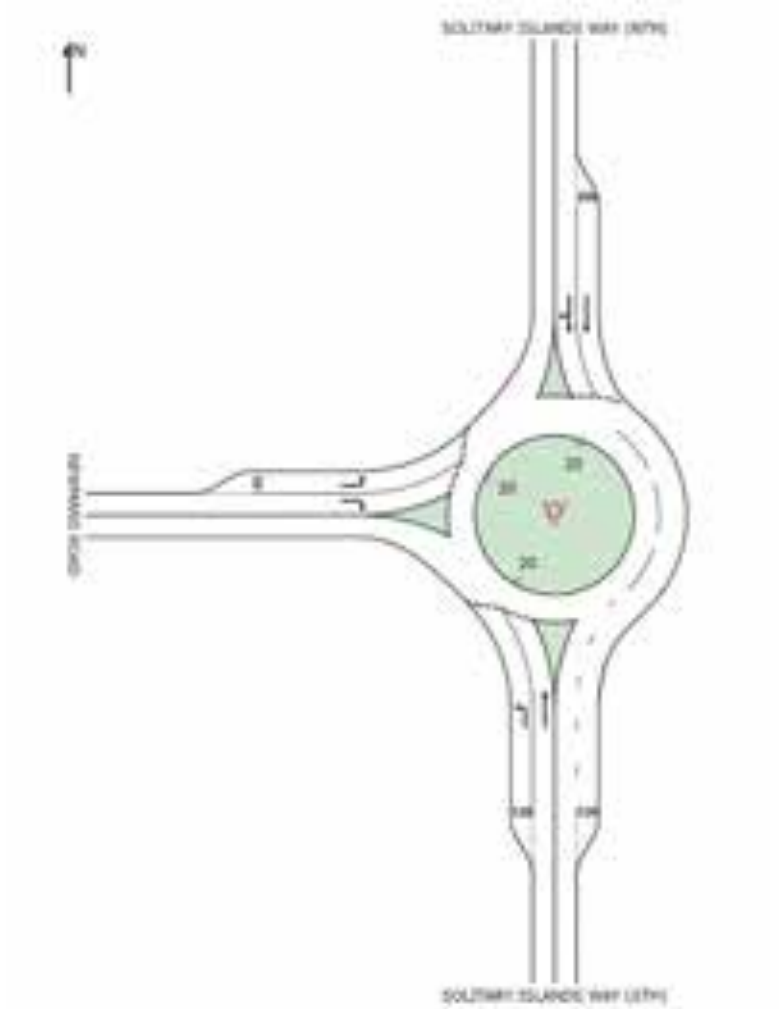
**MOVEMENT SUMMARY**

**Site: 2040 PM Peak DESIGN single roundabout**

Solitary Islands Way / Newmans Rd, Woolgoolga Roundabout

Movement Performance - Vehicles											
Move No.	CD Area	Design Flow (veh/h)	Design Flow (pc/h)	Cap. (veh/h)	Average Delay (sec)	Level of Service	95th Peak Hour Percentile Delay (sec)	95th Peak Hour Percentile Delay (pc)	Peak Delay (sec)	Effective Delay (sec/veh)	Average Speed (km/h)
<b>South SOLITARY ISLANDS WAY (PTV)</b>											
1	L2	376	5.0	0.729	4.7	LOS A	10.2	76.8	0.53	0.45	52.1
2	T1	754	10.0	0.729	5.0	LOS A	10.2	76.8	0.53	0.45	54.3
Approach		1040	8.7	0.729	4.9	LOS A	10.2	76.8	0.53	0.45	54.0
<b>North SOLITARY ISLANDS WAY (PTV)</b>											
6	T1	739	10.0	0.645	5.5	LOS A	7.1	55.3	0.43	0.34	53.3
8	R2	88	3.0	0.645	10.0	LOS B	7.1	55.3	0.43	0.34	53.3
Approach		807	6.8	0.645	5.8	LOS A	7.1	55.3	0.43	0.34	53.3
<b>West NEWMANS ROAD</b>											
10	L2	33	5.0	0.263	8.8	LOS A	5.8	12.9	0.83	0.87	48.7
12	R2	136	3.0	0.263	14.4	LOS B	5.8	12.9	0.83	0.87	49.7
Approach		168	5.0	0.263	15.5	LOS B	5.8	12.9	0.83	0.87	49.3
All Vehicles		2048	8.7	0.729	8.0	LOS A	10.2	76.8	0.59	0.52	53.4

SENSITIVITY – 2040 AM PEAK HOUR (TWO LANE ROUNDABOUT)



## MOVEMENT SUMMARY

Site: 2040 AM Peak DESIGN two lane roundabout

Solitary Islands Way / Newmans Rd, Woolgoolga Roundabout

Movement Performance - Vehicles												
Mov ID	Vol (veh)	Approach	Flow (veh)	PC %	Flow (veh)	Average Delay (s)	Level of Service	95% Conf. Interval (veh)	95% Conf. Interval (s)	Peak Clearance	Effective Stop Line (m)	Average Speed (km/h)
South SOLITARY ISLANDS WAY (S/W)												
1	L2		89	3.0	0.087	4.3	LOS A	9.0	3.1	0.14	0.47	34.8
2	T1		875	10.0	0.402	4.3	LOS A	3.4	28.2	0.16	0.38	30.8
Approach			964	9.4	0.402	4.3	LOS A	3.4	28.2	0.16	0.40	30.7
North SOLITARY ISLANDS WAY (N/W)												
6	T1		489	10.0	0.024	6.2	LOS A	4.0	33.8	0.47	0.81	33.4
9	R2		37	0.0	0.024	16.8	LOS B	4.0	33.8	0.49	0.60	33.9
Approach			527	9.9	0.024	6.2	LOS A	4.0	33.8	0.47	0.81	33.4
West NEWMANS ROAD												
10	L2		89	0.0	0.101	3.3	LOS A	0.0	3.8	0.48	0.74	31.2
12	R2		308	0.0	0.012	12.7	LOS B	2.1	15.5	0.71	0.80	30.3
Approach			397	0.0	0.012	12.1	LOS B	2.1	15.5	0.71	0.78	30.4
All Vehicles			2148	6.9	0.024	6.6	LOS A	4.0	33.8	0.36	0.57	33.8

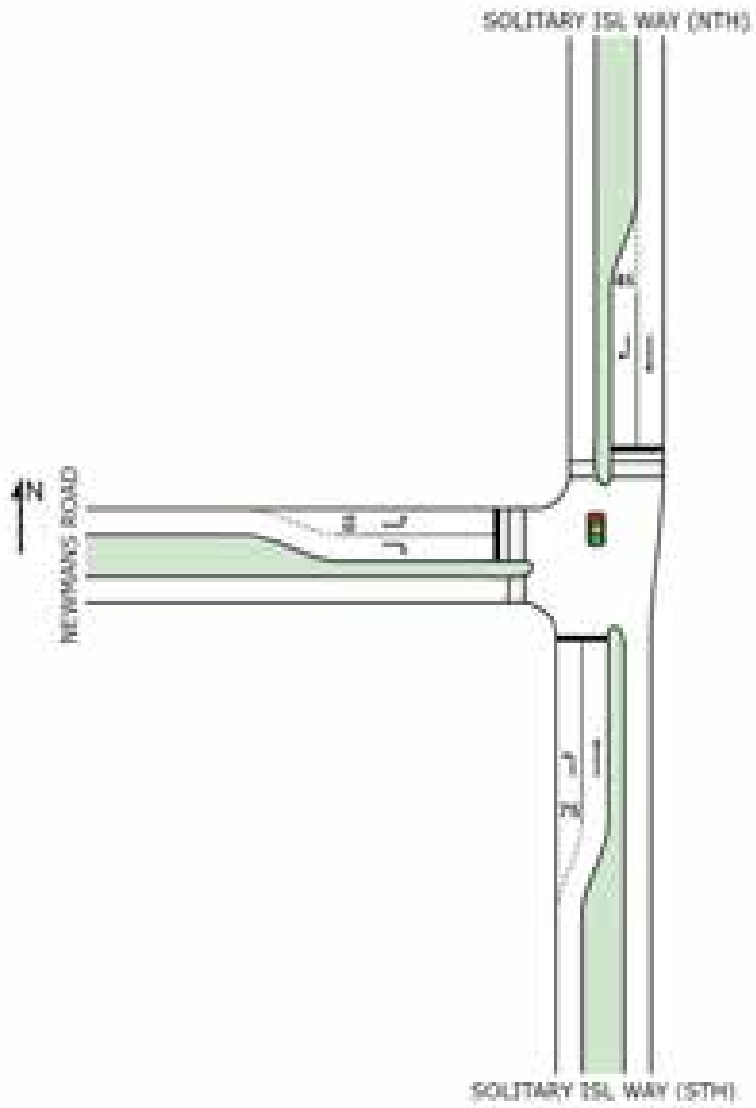
## MOVEMENT SUMMARY

Site: 2040 PM Peak DESIGN two lane roundabout

Solitary Islands Way / Newmans Rd, Woolgoolga Roundabout

Movement Performance - Vehicles												
Mov ID	Vol (veh)	Approach	Flow (veh)	PC %	Flow (veh)	Average Delay (s)	Level of Service	95% Conf. Interval (veh)	95% Conf. Interval (s)	Peak Clearance	Effective Stop Line (m)	Average Speed (km/h)
South SOLITARY ISLANDS WAY (S/W)												
1	L2		275	0.0	0.232	4.7	LOS A	1.4	40.3	0.26	0.48	34.2
2	T1		764	10.0	0.487	4.8	LOS A	4.1	31.9	0.27	0.42	35.1
Approach			1040	8.7	0.487	4.8	LOS A	4.1	31.9	0.26	0.43	34.9
North SOLITARY ISLANDS WAY (N/W)												
6	T1		738	10.0	0.350	4.9	LOS A	3.7	26.3	0.41	0.48	34.4
9	R2		88	0.0	0.050	9.4	LOS A	3.7	26.3	0.41	0.49	34.3
Approach			827	9.9	0.350	5.3	LOS A	3.7	26.3	0.41	0.48	34.4
West NEWMANS ROAD												
10	L2		39	0.0	0.057	10.8	LOS B	0.0	2.3	0.75	0.75	30.7
12	R2		126	0.0	0.034	13.0	LOS B	1.0	7.8	0.76	0.76	30.1
Approach			165	0.0	0.034	12.0	LOS B	1.0	7.8	0.76	0.77	30.2
All Vehicles			2038	8.7	0.487	5.0	LOS A	4.1	31.9	0.26	0.48	34.3

APPENDIX D – SIDRA RESULTS (TRAFFIC SIGNALS AS PER GHD REPORT)



YEAR 2040 – WITH NEWMANS ROAD FULLY DEVELOPED

### MOVEMENT SUMMARY

**Site: 2040 AM Peak DESIGN signals**

Solitary Islands Way / Neamans Rd  
 Signals - Fixed Time Isolated - Cycle Time = 100 seconds (Practical Cycle Time)  
 Variable Sequence Analysis applied. The results are given for the selected output sequence.

Movement Performance - Vehicles												
Mov ID	Mov Desc	Count (Veh)	Flow (Veh/s)	Flow (Veh/m)	Approach	Level of Service	95th Percentile Delay (s)	95th Percentile Queue Length (m)	Delay (s)	Queue (Veh)	Storage (Veh)	
North SOLIDARY ISL WAY (S/W)												
1	L2	81	0.0	0.100	28.0	LOS C	8.0	25.4	0.00	0.71	41.0	
2	T1	675	10.0	0.797	31.4	LOS C	86.6	292.3	0.00	0.78	30.8	
Approach		757	6.4	0.797	36.8	LOS C	86.6	292.3	0.00	0.77	68.7	
North SOLIDARY ISL WAY (N/W)												
8	T1	640	0.0	1.000	117.0	LOS F	119.0	688.7	1.00	1.40	18.4	
9	R2	23	10.0	0.318	36.0	LOS F	1.7	12.8	1.00	0.71	24.4	
Approach		1057	5.1	1.000	136.2	LOS F	119.0	688.7	1.00	1.40	18.5	
West NEWMANS ROAD												
10	L2	48	0.0	0.076	64.7	LOS F	4.0	58.2	1.00	1.18	6.9	
12	R2	209	0.0	1.000	115.7	LOS F	30.2	264.0	1.00	1.18	15.4	
Approach		257	0.0	1.076	204.0	LOS F	30.2	264.0	1.00	1.18	18.7	
All Vehicles		2140	0.0	1.076	715.4	LOS F	119.0	688.7	0.94	1.19	27.3	

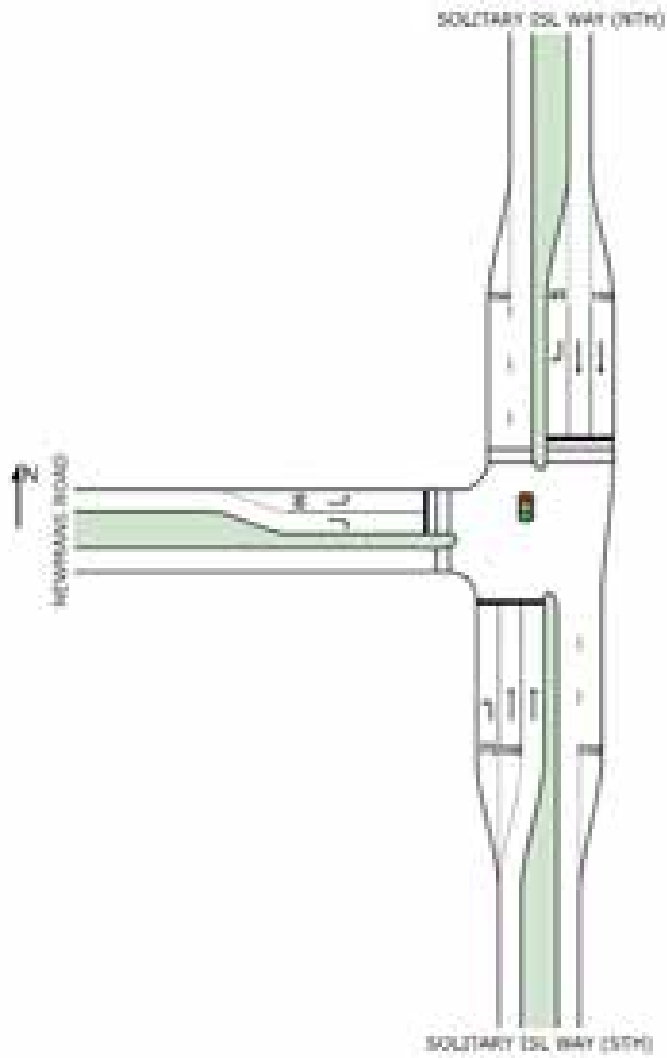
### MOVEMENT SUMMARY

**Site: 2040 PM Peak DESIGN GRD signals**

Solitary Islands Way / Neamans Rd  
 Signals - Fixed Time Isolated - Cycle Time = 100 seconds (Practical Cycle Time)  
 Variable Sequence Analysis applied. The results are given for the selected output sequence.

Movement Performance - Vehicles												
Mov ID	Mov Desc	Count (Veh)	Flow (Veh/s)	Flow (Veh/m)	Approach	Level of Service	95th Percentile Delay (s)	95th Percentile Queue Length (m)	Delay (s)	Queue (Veh)	Storage (Veh)	
North SOLIDARY ISL WAY (S/W)												
1	L2	276	0.0	0.267	23.7	LOS C	8.8	40.8	0.00	0.73	44.1	
2	T1	764	10.0	0.676	30.7	LOS C	48.7	300.0	0.79	0.78	38.8	
Approach		1040	6.7	0.676	27.6	LOS C	48.7	300.0	0.72	0.78	40.8	
North SOLIDARY ISL WAY (N/W)												
8	T1	739	0.0	0.739	28.0	LOS C	30.0	230.8	0.76	0.89	45.0	
9	R2	68	10.0	0.898	32.9	LOS F	4.8	37.3	1.00	0.82	23.0	
Approach		807	5.4	0.898	25.0	LOS C	30.0	230.8	0.77	0.71	43.3	
West NEWMANS ROAD												
10	L2	39	0.0	0.197	68.1	LOS E	2.0	14.4	0.00	0.73	25.0	
12	R2	138	0.0	0.888	80.3	LOS F	9.7	70.7	1.00	0.88	25.8	
Approach		168	0.0	0.888	71.9	LOS E	9.7	70.7	0.99	0.81	26.0	
All Vehicles		2118	7.1	0.888	31.1	LOS C	48.7	300.0	0.78	0.78	38.8	

SENSITIVITY – EXPANDED SIGNALISED LAYOUT





YEAR 2040 – WITH NEWMANS ROAD FULLY DEVELOPED

**MOVEMENT SUMMARY**

Site: 2040 AM Peak DESIGN RTE signals

Solders Islands Way / Newmans Rd  
 Signals - Fixed Time Isolated - Cycle Time = 100 seconds (Practical Cycle Time)  
 Variable Sequence Analysis applied. The results are given for the selected output sequence.

Movement Performance - Vehicles												
Mov ID	Dir	Flow	Capacity (Veh/h)	Flow/Cap (%)	Average Delay (sec)	Level of Service	95%ile Delay (sec)	95%ile Delay (sec)	Delay (sec)	Effective Green Time (sec)	Average Speed (km/h)	
South SOLIDARY WAY (S/W) (S/T)												
1	L2	88	9.0	0.132	51.2	LOS C	1.1	22.9	0.75	0.74	38.1	
2	T1	875	10.0	0.603	29.0	LOS C	10.3	116.2	0.87	0.75	46.4	
Approach												
		767	9.4	0.603	29.1	LOS C	15.3	116.2	0.88	0.74	46.0	
North SOLIDARY WAY (S/W) (N/T)												
8	T1	885	9.0	0.607	26.9	LOS D	28.3	206.9	0.88	0.82	37.3	
9	R2	27	10.0	0.213	57.2	LOS E	1.1	8.4	0.88	0.71	36.4	
Approach												
		1017	9.1	0.607	37.4	LOS D	28.3	206.9	0.88	0.82	37.1	
West NEWMANS ROAD												
10	L2	68	9.0	0.248	47.6	LOS D	1.8	21.1	0.82	0.75	33.1	
12	R2	326	9.0	0.602	55.9	LOS E	16.7	122.1	1.00	0.66	30.8	
Approach												
		379	9.0	0.602	54.4	LOS D	16.7	122.1	0.99	0.66	31.2	
All Vehicles												
		2149	9.0	0.607	37.4	LOS D	28.3	206.9	0.88	0.82	37.0	

**MOVEMENT SUMMARY**

Site: 2040 PM Peak DESIGN RTE signals

Solders Islands Way / Newmans Rd  
 Signals - Fixed Time Isolated - Cycle Time = 75 seconds (Practical Cycle Time)  
 Variable Sequence Analysis applied. The results are given for the selected output sequence.

Movement Performance - Vehicles												
Mov ID	Dir	Flow	Capacity (Veh/h)	Flow/Cap (%)	Average Delay (sec)	Level of Service	95%ile Delay (sec)	95%ile Delay (sec)	Delay (sec)	Effective Green Time (sec)	Average Speed (km/h)	
South SOLIDARY WAY (S/W) (S/T)												
1	L2	275	9.0	0.469	27.8	LOS C	7.8	57.8	0.88	0.81	46.7	
2	T1	754	10.0	0.739	24.8	LOS C	13.8	108.8	0.91	0.83	43.0	
Approach												
		1040	8.7	0.739	24.8	LOS C	13.8	108.8	0.91	0.82	42.4	
North SOLIDARY WAY (S/W) (N/T)												
8	T1	234	9.0	0.722	23.3	LOS C	12.8	91.5	1.01	0.85	43.4	
9	R2	68	10.0	0.480	41.3	LOS D	2.4	18.4	1.00	0.76	38.0	
Approach												
		807	8.4	0.722	24.8	LOS C	12.8	91.5	1.02	0.85	42.8	
West NEWMANS ROAD												
10	L2	81	9.0	0.198	53.8	LOS D	5.8	7.2	0.88	0.71	37.8	
12	R2	136	9.0	0.757	43.8	LOS D	5.1	37.2	1.00	0.80	34.4	
Approach												
		188	9.0	0.757	41.8	LOS D	5.1	37.2	0.99	0.80	35.0	
All Vehicles												
		2034	7.1	0.757	38.2	LOS C	13.8	108.8	0.92	0.82	41.7	

# Appendix I ~ Preliminary Land Contamination Report





# Whitehead & Associates

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Sunderpal Sodhi c/-  
Keiley Hunter Town Planning  
PO Box 4481  
Coffs Harbour NSW 2450

Date: 16 August 2019  
Ref: 2438 AC 160819sd

### Re: Preliminary ESA for Lot 202 DP874273, Woolgoolga

Dear Sir, please find attached a copy of the Preliminary Environmental Site Assessment for Lot 202 DP 87427, Newmans Road, Woolgoolga.

In accordance with Coffs Harbour Shire Councils 2018 Contaminated Land Policy and Procedure (POL-018 and PRO-086), I certify the attached report and provide the following information:

Criteria	Information
Contact Details	<a href="mailto:strider@whiteheadenvironmental.com.au">strider@whiteheadenvironmental.com.au</a> ph 02-66511512
Scope of Works	Historical review, site inspection and check sampling.
Qualifications	Member Australian Land & Groundwater Association Member Environment Institute of Australia and New Zealand Inc CEnvP (Contaminated Sites Specialist) Accredited (No. SC41100)
Past Experience and References	Lakes Estate - Astoria Projects – Lisa 66519683 Amble Inn Corindi - John Matthews 0437593760



For and on behalf of  
Whitehead & Associates

Strider Duerinckx  
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## **Preliminary Environmental Site Assessment at Lot 202 DP 874273 Newmans Road, Woolgoolga**

Prepared for Sunderpal Sodhi C/o: Keiley Hunter Town Planning

Prepared by Strider Duerinckx

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## Document Control Sheet

Document and Project Details					
<b>Document Title:</b>		Preliminary Environmental Site Assessment at Lot 202 DP 874273 Newmans Road, Woolgoolga			
<b>Author:</b>		Mei Wong			
<b>Project Manager:</b>		Strider Duerinckx			
<b>Date of Issue:</b>		16 August 2019			
<b>Job Reference:</b>		2438 PESA 160819mw			
<b>Synopsis:</b>		A desktop historical review, site inspection and check sampling for the purposed of site contamination investigation.			
Client Details					
<b>Client:</b>		Sunderpal Sodhi			
<b>Primary Contact:</b>		Keiley Hunter Town Planning			
Document Distribution					
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			Planner	Auditor	Client
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002	16/8/19	Final	1e		1e
Document Verification					
<b>Checked by:</b> Bridget Whitehead				<b>Issued by:</b> Strider Duerinckx	
					

## Disclaimer

The information contained in this report is based on independent research undertaken by Mei Wong and Strider Duerinckx of Whitehead & Associates Environmental Consultants Pty Ltd (W&A). To my knowledge, it does not contain any false, misleading or incomplete information. Recommendations are based on an appraisal of the site conditions subject to the limited scope and resources available for this project and follow relevant industry standards. The work performed by W&A included a desktop review and limited check sampling only, and the conclusions and recommendations drawn in this report are based on the information gained and the assumptions as outlined.

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**Attached Tables**

Table LR1 Summary of Soil Analytical Results

**Figures**

Figure 1 Site Location  
Figure 2 Proposed Rezoning Site Layout  
Figure 3 Existing Layout and Sampling Locations

**Appendices**

Appendix A Historical Titles  
Appendix B Lotsearch Report  
Appendix C Aerial Photographs  
Appendix D Laboratory Report

# 1 Introduction

## 1.1 Background

Whitehead and Associates Pty Limited (W&A) were engaged by Sunderpal Sodhi (the 'Client') to undertake a Preliminary Environmental Site Assessment (Phase 1 ESA) for the proposed residential development of Lot 202 DP 874273, Woolgoolga NSW (the 'Site') (Figure 1).

This investigation and reporting follows the requirements of NSW Office of SEPP55 (1998) and Environmental and Heritage (2011) Guidelines.

## 1.2 Objectives and Scope

The objectives of the Phase 1 ESA are to:

- Investigate the Site history and identify potentially contaminating activities that are currently being performed on the Site or that may have been performed on the Site in the past; and
- Make a preliminary assessment of potential contamination issues for residential development based on the Site history review.

The scope of work included:

- A Site history review including:
  - Historical aerial photographs;
  - NSW EPA notices and databases;
  - Adjacent landuses;
  - Adjacent former businesses; and
  - Environmental constraints or sensitive receptors.
- A site inspection to assess surface conditions;
- Interview if available with previous owners/employees;
- Development of potential areas and contaminants of concern and development of a Conceptual Site Model (CSM);
- Collection of two surface check samples for confirmation of the contamination status, and analysis for heavy metals and OCP/OPP pesticides; and
- Preparation of this report on the Site including recommendations for further investigations as considered necessary.



### 1.3 Site Identification

The Site details are provided in Table 1 and shown in Figure 1.

**Table 1 - Site Identification**

Address	Lot ID	Approx Area (m <sup>2</sup> )
Newmans Road	Lot 202 DP874273	92,244

### 1.4 Proposed Development

In anticipation of a proposal to develop 94 residential blocks on the Site (Figure 2) (Ref: Jackie Amos Landscape Architect, Planning Proposal Proposed Subdivision Layout Newmans Rd, 1730-06 dated September 2018), it is proposed to rezone the Site from RU2 Rural Landscape to R2 Low Density Residential with an area of E3 Environmental Management.

## 2 Site Inspection

A site inspection was undertaken on 25<sup>th</sup> July 2019 by Mei Wong (Figure 3). During the inspections it was noted that:

- The Site contained little to no visual signs of development, built structures or previous land-use indicators;
- A grass vehicle track passes up through the centre of the Site;
- The northeast corner just along the property boundary had evidence of some dumped cement blocks (<1m<sup>3</sup>);
- A mostly natural landform is present for the Site;
- No other signs of disturbance were noted; and
- No chemical storage areas were visible.



**Photograph 1.** Looking north-northwest from centre point along southern property boundary.



**Photograph 2.** Dumped concrete near eastern boundary.

## **3 Geology, Hydrogeology and Topography**

### **3.1 Topography**

The Site is located on a low knoll about 30mAHD, with surface slopes radially down to the northeast, northwest and southwest.

A dam is present offsite to the South and a drainage alignment swings down along the northeastern boundary.

### **3.2 Geology**

The Site is underlain by Carboniferous-aged bedrock belonging to the Coramba beds of the Coffs Harbour Association. These are metamorphosed mainly marine sedimentary rocks and associated volcanics including lithofeldspathic wacke, minor siltstone, siliceous siltstone, mudstone, metabasalt, chert & jasper, rare calcareous siltstone & felsic volcanics.

### **3.3 Hydrogeology**

The Site is underlain by a fractured bedrock aquifer of low to moderate productivity. Groundwater is used extensively in the Woolgoolga area for agricultural purposes and multiple licensed bores are located in the vicinity of the Site. A complete list of bores and locations are provided in Appendix B (pg 39). The closest two bores (GW302452 and 453) are located to the south of the Site and were both drilled in 1994 for domestic/stock purposes. The final depths drilled were 61m and 120m respectively. No further details are available.

Other nearby bores were drilled to between ~31 and 53m with the standing water level at 4-18m depth.

Regional groundwater is not expected to be impacted by historical activities on the Site, and contaminated groundwater is not expected to be flowing onto the Site from up hydraulic gradient sources.

## **4 Site History Review**

### **4.1 Interviews**

The owner of the Site Mika Sodhi was present during the Site inspection and interviewed 25 July 2019 and indicated that:

- The property has been in the current owners' care since 1990 when it was purchased;
- The Site known by the current Lot and DP number was originally a single larger connected lot until the government council repurchased a portion to be used as RE1 Public Recreation;
- Before that the land was owned by another family with no known history of cultivated agricultural use or development, but with intermittent use for recreational livestock grazing; and
- No other potentially contaminating activities were known to have taken place on Site.

## 4.2 Adjacent Landuses

The adjacent landuses include:

- Forested and cleared open space to the north;
- Rural-residential landuse to the south and west; and
- A large dam to the east.

## 4.3 Titles Search

A list of past registered proprietors of Lot 202 was obtained from the Land Titles Office from the present back to 1972. Copies of these results are included in Appendix A and are summarised in Table 2. The results confirm ownership back to 1990 by the current owner, then the former grazier ownership back to 1978.

**Table 2 - Summary of Previous Ownership**

Year	Proprietor(s)
	<b>(Lot 202 DP 874273)</b>
2006 – to date	Vadejil Pty. Limited
1998-2006	Gabazo Pty Limited
	<b>(Lot 20 DP 800222)</b>
1990-1998	Gabazo Pty Limited
1990 – 1990	John Lehman, farmer
	<b>(Lot 5 DP 242839)</b>
1988 – 1990	John Lehman, farmer
	<b>(Lot 5 DP 242839 – CTVol 12977 Fol 150)</b>
1978 – 1988	John Lehman, farmer
1976 – 1978	The Minister for Public Works
	<b>(Lot 1 DP 227586 – CTVol 11927 Fol 216)</b>
1972 – 1976	The Minister for Public Works

## 4.4 Council Records Search

CHCC holds historical records for Development Applications (DAs) and Building Applications (BAs). A search of the computer records indicated that there have been no previous DAs and BAs submitted for the Site.

## 4.5 Lotsearch Contaminated Lands Database

A search of the Lotsearch company database was undertaken by W&A of the property (Appendix B). Lotsearch have compiled and provide up to date record summaries of various parameters that may be useful for contamination investigations.

### 4.5.1 NSW EPA Records

Lotsearch identified that no former gasworks sites, PFAS investigation areas, no James Hardie asbestos manufacturing or waste disposal locations, waste management areas, defence contamination investigation sites, or radiological investigation areas are present within 1000m of the Site.

Lotsearch identified one (1) record from NSW EPA Contaminated Land listed sites within the 1000m buffer of the Site as being a petroleum service station about 861m southeast. Assessment of contamination has been completed and deemed not required under CLM Act.

Lotsearch identified one (1) licensed activity under the POEO Act 1997 within the 1000m buffer of the Site as being road construction of Pacific Highway about 901m involving crushing, grinding or separating of land-based extractive activities.

No cattle tick dip sites were identified within the 1000m buffer of the Site.

#### **4.5.2 Business Directories Register**

No businesses were registered on the Site in the business directories register database held by Lotsearch and accessed by W&A.

No onsite or nearby dry cleaners, service stations or motor garages have been listed in business directories from 1961, 1970 or 1982.

### **4.6 Banana Cultivation**

The Coffs Harbour City Council online mapping database confirms that no historical banana cultivation activities occurred on or adjacent to the Site.

### **4.7 Aerial Photograph Review**

Historical aerial photographs from 1964-2019 were purchased and reviewed by a W&A Environmental Scientist.

The results of the aerial photograph review are summarised in the following Table 3. The significant aerial photographs are presented in Appendix C.

**Table 3 - Aerial Photograph Review**

<b>Year</b>	<b>Site</b>	<b>Surrounding Land</b>
1964	The Site has no development at present and is open grass land with scattered trees mostly close to drainage pathways. No buildings or structures can be seen on Site.	Undeveloped bushlands surround the majority of the Site. Further southeast more urban developments are present in Woolgoolga township. South-southeast a small dam and building are present.
1974	Similar to 1964 aerial with additional clearing visible for lot separation of land.	Similar to 1964 with more signs of clearing land to the west with evidence of road tracks appearing. Woolgoolga township to the southeast appears much the same. The small dam along the southeast boundary has expanded and the building next to it is no longer present, though new structures can be seen around the vicinity.
1981	Generally, as per 1974. Faint tracks can be seen along the Site boundaries and through some parts of the Site. No built structures are visible on Site.	Extensive tree clearing and construction of roadways on surrounding lots to the west. Rural building structures have begun to appear more west inland. Continued tree clearing and lot separation visible west and northwest.

Year	Site	Surrounding Land
2000	As per 1981.	Lots to the west and northwest appear to have been rezoned and are now completely subdivided into smaller lots with residential dwellings visible. East-southeast the township has expanded with new residential lots appearing closer to the Site.
2009	Generally, as per 2000. The Site has been cleared of the majority of trees except along the waterway and with some scattered near Site boundaries.	Residential developments to the west have continued to increase with more dwellings appearing in previously vacant lots. Similarly, empty lots southeast appear to have increased the number of dwellings present.
2011 (Nearmap)	Generally, as per 2007. No significant changes to the Site can be seen. Slight increase in tree cover to the southern boundary.	Continued residential developments surrounding the Site. Market garden rows and commercial agriculture visible on lots to the north and west.
2013 (Nearmap)	As per 2011 no significant changes to the Site.	Generally similar to 2011 with slight increase in number of commercial agriculture/market gardening further inland west.
2014-2017 (Nearmap)	As per 2013. Grass land covers the whole Site with slight increase in tree coverage.	As per 2013.
2018-2019 (Nearmap)	As per 2014-2017. No notable changes to the Site except more prominent dirt tracks appearing.	As per 2014-2017.

## 4.8 Historical Mapped Layout

W&A accessed a copy of 1941, 1974 and 2015 topographic maps of the area via the Lotsearch database (Appendix B):

- The 1941 topographic map shows the Site as cleared land with no structures.
- The 1974 topographic map shows a similar layout to 1941 but with increased number of structures (dwellings) south and to the east. A square at the southern tip of the south precinct seems to indicate a possible dwelling on Site though no evidence could be seen in the 1974 aerial photos or subsequent years; and
- The 2015 topographic map shows the established road networks and rezoning of land allowing smaller lot residential subdivisions surrounding the Site.

## 4.9 Summary of Site History

The information obtained from the site history review can be summarised as follows:

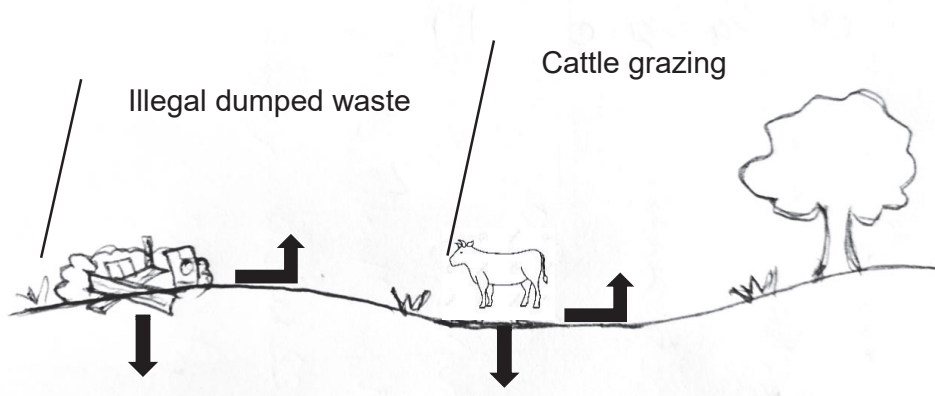
- The Site has been owned by only two parties since 1972, with a grazier in ownership up to 1990 then the current owner;
- The Site appears to have been gradually cleared of most forest trees between 1964-1974 but with no other evidence of changing the landscape topography;
- No construction or commercial agricultural activities were known to have taken place on the Site;
- The Site has remained relatively unchanged since it was originally owned.
- No further major changes have occurred to present.

## 5 Gaps in the Site History

Given the historical review and current status of the Site, there is a low risk of potential contamination from unknown materials and activities to be present.

## 6 Conceptual Site Model

The Conceptual Site Model (CSM) for the Site is presented in Table 4 and Model 1.



**Model 1. Conceptual Site Model**

**Table 4 - Conceptual Site Model Pathways**

Element	Sub-Element	Comment
<b>Mechanism of Contamination</b>		Near surface inorganic and organic contaminants may be present from former cattle grazing and dumped rubbish.
<b>Potentially Affected Media</b>	Soil	Yes if present and disturbed.
	Sediment	No waterways pass through the Site. No residential development is proposed within 45m of the waterway.

Element	Sub-Element	Comment
	Groundwater	Groundwater is present at depth but unlikely to be affected.
	Surface Water	No waterways pass through the Site only drainage flow paths.
	Indoor	Volatile contamination is generally not expected at the Site.
	Ambient Air	Significant volatile contamination is generally not expected at the Site.
<b>Receptors</b>	Human	<p>The primary human receptors are adults and children in future residences on the site. Given the block sizes and general footprint of dwellings, actual soil contact is expected to be minimal.</p> <p>Short term exposure to workers is possible during the construction phase of the proposed development and future residences.</p>
	Ecological	Minimal future ecological exposure pathways are present and are limited to surface vegetation of garden residential plant species, and secondary fauna interactions (eg insects eating plants; birds eating insects).
<b>Exposure Pathways</b>	Potential	Potential future exposure routes are primarily associated with exposure to soil, including inhalation during disturbance, ingestion and dermal routes of inorganics and organic contamination by workers and long-term residents.
	Complete	Complete human exposure routes have not been identified at this time.

## 7 Potential Areas and Chemicals of Concern

Based on the site history the AECs and associated COCs for the Site have been identified. These are presented in Table 5 and summarised in Figure 3.

**Table 5 - Potential AECs and COCs**

AE C	Size (m <sup>2</sup> )	Potential Contam. Activity	COCs	Likelihood of Contam.	Comment
1	Entire 92,244m <sup>2</sup> area	Unknown historical usage.	Heavy Metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc), OCP, OPP.	Very Low	Site history only indicates limited grazing which poses a very low risk.



## 8 Environmental Check Sampling

Two check samples were collected, one for each of the precincts and analysed for the COCs as shown in Table 6 and Figure 3.

**Table 6 - Sampling Plan**

Loc	Depth (m)	AEC	Heavy Metals	OCP/ OPP
S-1	0-0.15	1	1	1
S-2	0-0.15	1	1	1

Environmental sampling activities were based on standard industry accepted standard practices and were undertaken by a trained W&A environmental scientist. The standard industry procedures included:

- Recording of samples in field notes during sample collection;
- Use of disposable nitrile gloves, changing between sample collection;
- Decontamination of sampling equipment between each sample collection by washing in water/soap, rinsing once more in water and allowing to air dry;
- Placement of samples into laboratory supplied Teflon-lined glass jars, and stored in chilled esky; and
- Carriage of samples under chain-of-custody conditions.

Samples were forwarded to Eurofins laboratory, an independent laboratory NATA accredited for the analytical methods used.

As only a preliminary sampling program was undertaken, field Quality Assurance and Quality Control (QA/QC) sampling was not undertaken.

Eurofins laboratory is a reputable environmental laboratory which undertakes analyses to NATA accredited analytical methodologies and participates in NATA endorsed laboratory round robin analyses.

### 8.1 Investigation Criteria

The National Environmental Protection (Assessment of Site Contamination) Amendment Measure 1999, was amended in 2013 (NEPC 2013) and has been accepted for use in NSW by the NSW EPA.

NEPM 2013 presents Health based Investigation levels (HIL) for different land uses (e.g. industrial/commercial, residential, recreational open space etc.) as well as provisional Ecological Investigation Levels (EIL), Ecological Screening Levels (ESL), Health Screening Levels (HSL) and Management Limits (ML).

The HILs, HSLs and MLs were developed from significant review of toxicological data and risk assessment modelling undertaken and originally published by the National Environmental Protection Council (NEPC) in the NEPM 1999 document.

*"The HILs are scientifically based, generic assessment criteria to be used in the first stage (Tier 1) of an assessment of potential risks to human health from chronic exposure to*

contaminants. They are intentionally conservative and are based on a reasonable worst-case scenario".

"HILs are investigation or screening levels, and are not clean-up or response levels, nor are they desirable soil quality criteria. They are intended to be used to trigger consideration of an appropriate site-specific risk-based approach or appropriate risk-based management options when they are exceeded". (NEPC 2013 Schedule B1 p4).

As the Site is proposed for use as residential, the adopted screening/investigation levels for the Site are for "Residential A".

The NEPM 2013 provides EILs for common heavy metals including arsenic, chromium III, copper, lead, nickel, mercury and zinc in different landuse settings. The approach for deriving EILs for heavy metals is to combine background concentrations (i.e. naturally occurring) with an added contaminant limit (ACL), that is  $EIL = background + ACL$ . As background sampling was not undertaken, the adopted EILs for the Site included assumed background concentrations based on previous experience in the area. EILs for residential use were calculated and adopted.

The investigation criteria for the Site are included in the attached summary Table LR1.

## 8.2 Surface conditions

The sample descriptions are presented in Table 7 and the sampling locations are presented in Figure 3.

No suspected Asbestos Containing Materials (ACM) materials were observed.

**Table 7 - Sample Details**

Sample ID	Depth (m)	Description
S-1	0-0.15	Dark Brown clay loam
S-2	0-0.15	Brown clay loam

## 8.3 Analytical Results

The analytical results are summarised in Table LR1, and laboratory report is included in Appendix D. Comparison of soil concentrations to the investigation criteria indicated that:

- Concentrations of heavy metals were reported well below the HIL A and EIL investigation criteria in all samples;
- Concentrations of OCP, OPP were reported below the laboratory Limit of Reporting (LOR) in the samples analysed. The LOR were all below the investigation criteria as available;

## 9 Discussion of Results

The risks of contamination at the property from any previous and current activities are generally considered to be low.

The available historical records do not indicate any potentially contaminating activities to have occurred on Site, and at least not in the past 20 years since the current owner has purchased the land. The Site is considered to have a very low risk of contamination.

While some anthropogenic material was found on or just outside Site boundaries there was minimal signs of any recent activity and this material consisted of concrete only and small (<2m<sup>3</sup>) volume.

The analytical results of check sampling in the area also confirmed the conclusion of no significant risk, with concentrations of heavy metals, OCP and OPP reported well below the investigation criteria for residential sites.

It is recommended that management of the Site such as by fencing tracks is undertaken to further reduce the risk of potentially contaminating activities entering the Site through illegal means.

## **10 Conclusions and Recommendations**

A Phase 1 Environmental Site Assessment has been undertaken at Lot 202 DP 874273, Woolgoolga. The historical desktop review and site inspection shows that there is a very low risk of significant contamination being present that would preclude the proposed R2 Low Density Residential landuse of the Site. No further environmental investigations at this time are required to allow the proposed residential rezoning.

It is recommended that during development if previously unidentified materials such as odorous or discoloured soils, monolithic deposits or potential ACM are identified, the environmental consultant should be contacted to provide further advice.

## **11 References**

DUAP & EPA (1998). *Managing Land Contamination – Planning Guidelines SEPP55 – Remediation of Land*. Department of Urban Affairs and Planning, and NSW Environment protection Authority.

OE&H (2011). *Guidelines for Consultants Reporting on Contaminated Sites*. 3rd Print.

NEPC (2013). 2013 Amendment to the *National Environment Protection (Assessment of Site Contamination) Measure 1999*. National Environment Protection Council.

## Figures

**LEGEND**

- Property Boundary
- - - Drainage Alignment
- Pond/Dam



**W** Whitehead & Associates  
Environmental Consultants

Horizontal Scale (metres) 1:10000

Client: **SUNDERPAL SODHI C/O:  
KEILEY HUNTER TOWN  
PLANNING**

Project: **PESA FOR LOT 202  
DP874273, WOOLGOOLGA**

Note: **AERIAL PHOTOS & BOUNDARIES  
ARE INDICATIVE ONLY**

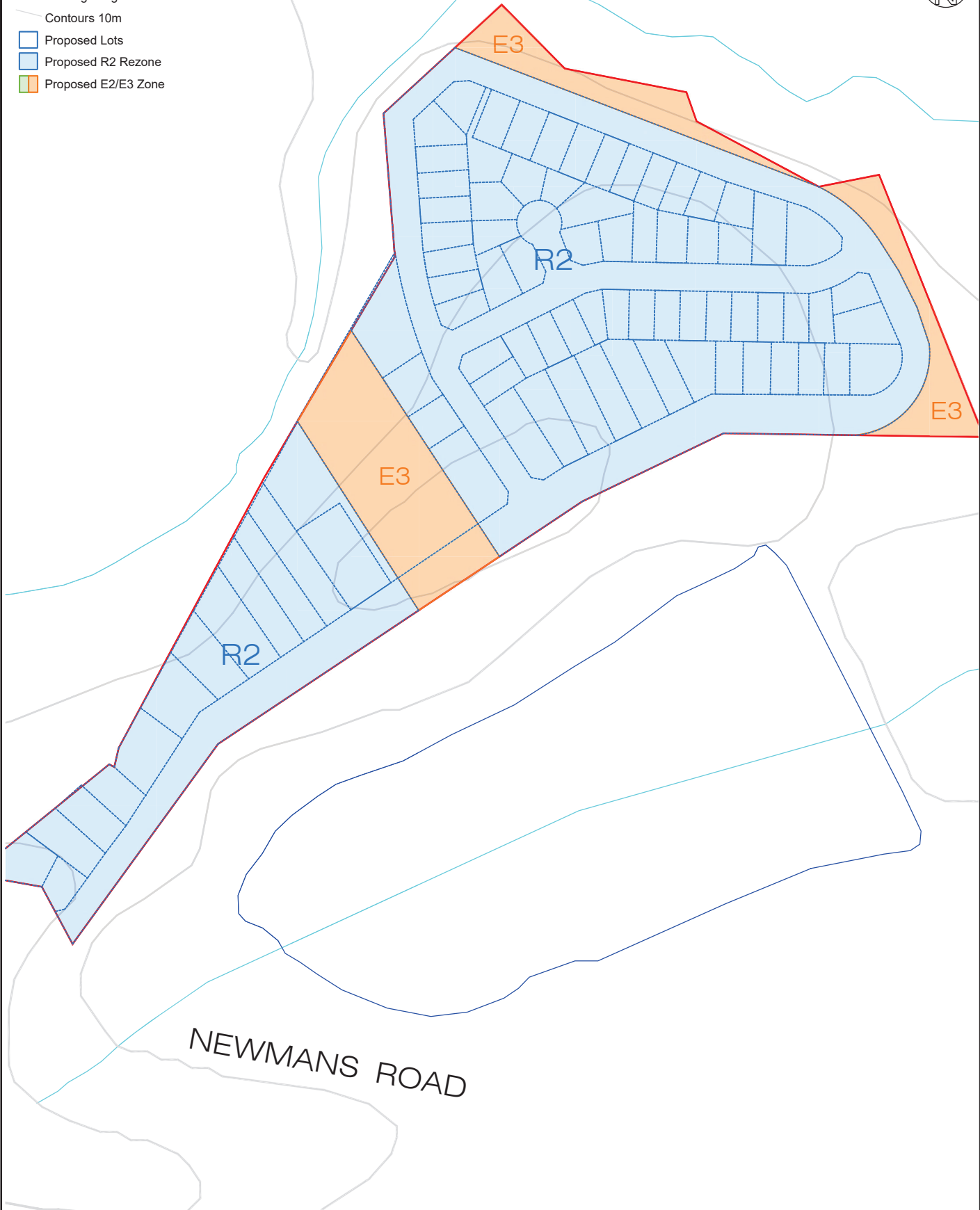
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Source: **CHCC, NEARMAP,  
JACKIE AMOS  
LANDSCAPE ARCHITECT**

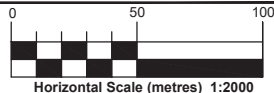
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Reviewed: SD	Job No: 2438	Revision No: 1
Approved: SD	Date: 7/8/19	Drawing No: Figure 1

**LEGEND**

- Property Boundary
- Drainage Alignment
- Contours 10m
- Proposed Lots
- Proposed R2 Rezone
- Proposed E2/E3 Zone



 <p><b>Whitehead &amp; Associates</b> Environmental Consultants</p>	Client: <b>SUNDERPAL SODHI C/O: KEILEY HUNTER TOWN PLANNING</b>	Title: <b>PROPOSED REZONING LAYOUT</b>	Drawn:	Reviewed:	Approved:	Date:	Scale: 1:2000 Approx @ A3	
	Project: <b>PESA FOR LOT 202 DP874273, WOOLGOOLGA</b>	Source: <b>CHCC, NEARMAP, JACKIE AMOS LANDSCAPE ARCHITECT</b>	MW	SD	SD	7/8/19	Job No: 2438	Sheet: 1 of 1
	Note: <b>AERIAL PHOTOGRAPHS &amp; BOUNDARIES ARE INDICATIVE ONLY</b>			All units in m unless otherwise specified			Drawing No: Figure 2	Revision No: 1



**LEGEND**

- Property Boundary
- Drainage Alignment
- Contours 10m
- Proposed Lots
- AEC Location
- E2/E3 Zone
- ↗ Slope Direction and Extent
- Approximate Sample Location



**Whitehead & Associates**  
Environmental Consultants

Client: **SUNDERPAL SODHI C/O:  
KEILEY HUNTER TOWN  
PLANNING**

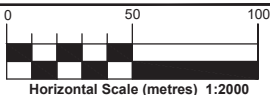
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AEC LOCATIONS SOUTH PRECINCT**  
Source: **CHCC, NEARMAP, JACKIE  
AMOS LANDSCAPE ARCHITECT**

Drawn:	Reviewed:	Approved:	Date:	Scale: 1:2000 Approx @ A3
MW	SD	SD	7/8/19	Job No: 2438
				Sheet: 1 of 1

Project: **PESA FOR LOT 202  
DP874273, WOOLGOOLGA**

Note: **AERIAL PHOTOGRAPHS &  
BOUNDARIES ARE INDICATIVE ONLY**

All units in m unless otherwise specified				Drawing No: Figure 3	Revision No: 1
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## Tables



**Table LR1: Summary of Soil Analytical Results**

Sample ID		Units	LOR	Investigation Criteria		S-1	S-2
Date Sampled				(HIL A)	(EIL)*	25/07/2019	25/07/2019
Depth						0-0.15	0-0.15
AEC						1	1
<b>Total Metals</b>							
Arsenic	mg/kg	2	100	100	5	3.3	
Cadmium	mg/kg	0.4	20	-	< 0.4	< 0.4	
Chromium Total	mg/kg	5	100	480	17	8.6	
Copper	mg/kg	5	6000	140	< 5	< 5	
Lead	mg/kg	5	300	1100	12	15	
Mercury	mg/kg	0.1	40	-	< 0.1	< 0.1	
Nickel	mg/kg	5	400	55	< 5	< 5	
Zinc	mg/kg	5	7400	210	11	8.4	
<b>Organochlorine Pesticides (OC)</b>							
4,4'-DDD	mg/kg	0.05	-	-	< 0.05	< 0.05	
4,4'-DDE	mg/kg	0.05	-	-	< 0.05	< 0.05	
4,4'-DDT	mg/kg	0.05	-	180	< 0.05	< 0.05	
a-BHC	mg/kg	0.05	-	-	< 0.05	< 0.05	
Aldrin	mg/kg	0.05	-	-	< 0.05	< 0.05	
Aldrin and Dieldrin (Total)*	mg/kg	0.05	6	-	< 0.05	< 0.05	
b-BHC	mg/kg	0.05	-	-	< 0.05	< 0.05	
Chlordanes - Total	mg/kg	0.1	50	-	< 0.1	< 0.1	
d-BHC	mg/kg	0.05	-	-	< 0.05	< 0.05	
DDT + DDE + DDD (Total)*	mg/kg	0.05	240	-	< 0.05	< 0.05	
Dieldrin	mg/kg	0.05	-	-	< 0.05	< 0.05	
Endosulfan I	mg/kg	0.05	-	-	< 0.05	< 0.05	
Endosulfan II	mg/kg	0.05	-	-	< 0.05	< 0.05	
Endosulfan sulphate	mg/kg	0.05	-	-	< 0.05	< 0.05	
Endrin	mg/kg	0.05	10	-	< 0.05	< 0.05	
Endrin aldehyde	mg/kg	0.05	-	-	< 0.05	< 0.05	
Endrin ketone	mg/kg	0.05	-	-	< 0.05	< 0.05	
g-BHC (Lindane)	mg/kg	0.05	-	-	< 0.05	< 0.05	
Heptachlor	mg/kg	0.05	6	-	< 0.05	< 0.05	
Heptachlor epoxide	mg/kg	0.05	-	-	< 0.05	< 0.05	
Hexachlorobenzene	mg/kg	0.05	10	-	< 0.05	< 0.05	
Methoxychlor	mg/kg	0.2	-	-	< 0.05	< 0.05	
Toxaphene	mg/kg	1	20	-	< 1	< 1	
<b>Organophosphorus Pesticides (OP)</b>							
Azinphos-methyl	mg/kg	0.2	-	-	< 0.2	< 0.2	
Bolstar	mg/kg	0.2	-	-	< 0.2	< 0.2	
Chlorfenvinphos	mg/kg	0.2	-	-	< 0.2	< 0.2	
Chlorpyrifos	mg/kg	0.2	160	-	< 0.2	< 0.2	
Chlorpyrifos-methyl	mg/kg	0.2	-	-	< 0.2	< 0.2	
Coumaphos	mg/kg	2	-	-	< 2	< 2	
Demeton-O	mg/kg	0.2	-	-	< 0.2	< 0.2	
Demeton-S	mg/kg	0.2	-	-	< 0.2	< 0.2	
Diazinon	mg/kg	0.2	-	-	< 0.2	< 0.2	
Dichlorvos	mg/kg	0.2	-	-	< 0.2	< 0.2	
Dimethoate	mg/kg	0.2	-	-	< 0.2	< 0.2	
Disulfoton	mg/kg	0.2	-	-	< 0.2	< 0.2	
EPN	mg/kg	0.2	-	-	< 0.2	< 0.2	
Ethion	mg/kg	0.2	-	-	< 0.2	< 0.2	
Ethoprop	mg/kg	0.2	-	-	< 0.2	< 0.2	
Ethyl parathion	mg/kg	0.2	-	-	< 0.2	< 0.2	
Fenitrothion	mg/kg	0.2	-	-	< 0.2	< 0.2	
Fensulfthion	mg/kg	0.2	-	-	< 0.2	< 0.2	
Fenthion	mg/kg	0.2	-	-	< 0.2	< 0.2	
Malathion	mg/kg	0.2	-	-	< 0.2	< 0.2	
Merphos	mg/kg	0.2	-	-	< 0.2	< 0.2	
Methyl parathion	mg/kg	0.2	-	-	< 0.2	< 0.2	
Mevinphos	mg/kg	0.2	-	-	< 0.2	< 0.2	
Monocrotophos	mg/kg	2	-	-	< 2	< 2	
Naled	mg/kg	0.2	-	-	< 0.2	< 0.2	
Omethoate	mg/kg	2	-	-	< 2	< 2	
Phorate	mg/kg	0.2	-	-	< 0.2	< 0.2	
Pirimiphos-methyl	mg/kg	0.2	-	-	< 0.2	< 0.2	
Pyrazophos	mg/kg	0.2	-	-	< 0.2	< 0.2	
Ronnel	mg/kg	0.2	-	-	< 0.2	< 0.2	
Terbufos	mg/kg	0.2	-	-	< 0.2	< 0.2	
Tetrachlorvinphos	mg/kg	0.2	-	-	< 0.2	< 0.2	
Tokuthion	mg/kg	0.2	-	-	< 0.2	< 0.2	
Trichloronate	mg/kg	0.2	-	-	< 0.2	< 0.2	























**Notes:**

- Indicates sample concentration exceeds investigation criteria value
- Indicates sample concentration exceeds investigation criteria value by >250%
- \* EIL background concentration based on nearby site previous investigations

# Appendix A

## Historical Titles





































	Status	Surv/Comp	Purpose
DP225161 Lot(s): 1	 DP1228360	REGISTERED	SURVEY
			ROADS ACT, 1993
DP250350 Lot(s): 117	 NSW GAZ.	04-09-2015	Folio : 2760
	LOT 117 DP250350 RESERVED AS PART OF COFFS COAST REGIONAL PARK		
DP749151 Lot(s): 2	 DP1068379	REGISTERED	SURVEY
			EASEMENT
DP836356 Lot(s): 172	 DP1030159	REGISTERED	SURVEY
			EASEMENT
DP851843 Lot(s): 60	 DP1010393	REGISTERED	COMPILATION
			EASEMENT
DP859080 Lot(s): 1, 2, 3, 4, 5	 DP1023212	REGISTERED	SURVEY
			SUBDIVISION
DP877179 Lot(s): 10, 11, 12	 DP1091439	REGISTERED	SURVEY
			SUBDIVISION
Lot(s): 6	 DP1023212	REGISTERED	SURVEY
			SUBDIVISION
DP1012577 Lot(s): 3	 DP874501	HISTORICAL	SURVEY
			SUBDIVISION
Lot(s): 1, 2	 DP838309	HISTORICAL	SURVEY
			SUBDIVISION
DP1014908 Lot(s): 4, 5	 DP874501	HISTORICAL	SURVEY
	 DP1012577	HISTORICAL	SURVEY
			SUBDIVISION
DP1023212 Lot(s): 17, 18, 19, 20, 21, 22, 23, 24	 DP877179	HISTORICAL	SURVEY
			SUBDIVISION
DP1031906 Lot(s): 6	 DP874501	HISTORICAL	SURVEY
	 DP1012577	HISTORICAL	SURVEY
	 DP1014908	HISTORICAL	SURVEY
			SUBDIVISION
DP1036615 Lot(s): 20, 21	 DP633281	HISTORICAL	SURVEY
			SUBDIVISION
DP1037815 Lot(s): 501, 502	 DP877507	HISTORICAL	SURVEY
			SUBDIVISION
Lot(s): 501	 DP221841	HISTORICAL	SURVEY
			SUBDIVISION
DP1038635 Lot(s): 25, 26, 28, 31	 DP877179	HISTORICAL	SURVEY
	 DP1023212	HISTORICAL	SURVEY
			SUBDIVISION
DP1054457 Lot(s): 7005	 NSW GAZ.	24-10-2008	Folio : 10348
	TRANSFER OF CROWN ROAD TO COUNCIL		
	LOT 7005 DP1054457		



































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	Status	Surv/Comp	Purpose
DP1054530 Lot(s): 7021	NSW GAZ. 02-04-1948 RESERVE NO. 72664 GOV. GAZ. 2-4-1948; APPOINTMENT OF ADMINISTRATOR TO MANAGE RESERVE TRUST GOV. GAZ. 11-1-2002 FOLIO 105; WOOLGOOLGA BEACH RESERVE TRUST		
DP1054532 Lot(s): 7024	NSW GAZ. 27-11-1931 RESERVE 63076 GOV. GAZ. 27-11-1931; APPOINTMENT OF ADMINISTRATOR TO MANAGE RESERVE TRUST GOV. GAZ. 11-1-2002 FOLIO 105; WOOLGOOLGA BEACH RESERVE TRUST		
DP1059909 Lot(s): 201, 202, 203, 204, 205			
DP800222	HISTORICAL	SURVEY	SUBDIVISION
DP1059641	HISTORICAL	SURVEY	SUBDIVISION
DP1060009 Lot(s): 8, 9			
DP874501	HISTORICAL	SURVEY	SUBDIVISION
DP1012577	HISTORICAL	SURVEY	SUBDIVISION
DP1014908	HISTORICAL	SURVEY	SUBDIVISION
DP1031906	HISTORICAL	SURVEY	SUBDIVISION
DP1062248 Lot(s): 15, 16			
DP1184040	REGISTERED	SURVEY	SUBDIVISION
Lot(s): 1, 2, 3, 5, 6, 7, 8, 9, 10, 11, 12, 13, 15, 16, 17, 18, 20, 21, 22, 23, 24			
DP714300	HISTORICAL	SURVEY	SUBDIVISION
DP1064162 Lot(s): 50, 51			
DP841096	HISTORICAL	COMPILATION	CONSOLIDATION
DP1064961 Lot(s): 34, 39, 40, 41, 42, 43			
DP714300	HISTORICAL	SURVEY	SUBDIVISION
DP1062248	HISTORICAL	SURVEY	SUBDIVISION
DP1071188 Lot(s): 20, 21			
DP807579	HISTORICAL	SURVEY	SUBDIVISION
DP1078521 Lot(s): 140, 141			
DP714300	HISTORICAL	SURVEY	SUBDIVISION
DP1062248	HISTORICAL	SURVEY	SUBDIVISION
DP1080111 Lot(s): 1, 2			
DP261998	HISTORICAL	SURVEY	SUBDIVISION
DP1087394 Lot(s): 1, 2, 3, 4, 5, 6			
DP1103328	REGISTERED	SURVEY	SUBDIVISION
Lot(s): 5, 6, 8, 9			
DP1059909	HISTORICAL	SURVEY	SUBDIVISION
Lot(s): 1, 2, 3, 4, 5, 6, 8, 9			
DP800222	HISTORICAL	SURVEY	SUBDIVISION
DP1059641	HISTORICAL	SURVEY	SUBDIVISION
DP1090723 Lot(s): 100			
DP244028	HISTORICAL	SURVEY	SUBDIVISION
DP1090917 Lot(s): 2			
DP777880	HISTORICAL	SURVEY	SUBDIVISION
Lot(s): 1, 2			
DP702294	HISTORICAL	SURVEY	SUBDIVISION
DP1091439 Lot(s): 8			
DP1251657	PRE-EXAM	SURVEY	SUBDIVISION


































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	Status	Surv/Comp	Purpose
Lot(s): 1, 2, 3, 4, 8			
 DP877179	HISTORICAL	SURVEY	SUBDIVISION
 DP1023212	HISTORICAL	SURVEY	SUBDIVISION
 DP1038635	HISTORICAL	SURVEY	SUBDIVISION
DP1092921			
Lot(s): 30, 31, 32, 33			
 DP714300	HISTORICAL	SURVEY	SUBDIVISION
 DP1062248	HISTORICAL	SURVEY	SUBDIVISION
 DP1064961	HISTORICAL	SURVEY	SUBDIVISION
DP1103328			
Lot(s): 11, 12, 14			
 DP800222	HISTORICAL	SURVEY	SUBDIVISION
 DP1059641	HISTORICAL	SURVEY	SUBDIVISION
 DP1059909	HISTORICAL	SURVEY	SUBDIVISION
 DP1087394	HISTORICAL	SURVEY	SUBDIVISION
DP1110643			
Lot(s): 17, 18, 19, 20, 21			
 DP800222	HISTORICAL	SURVEY	SUBDIVISION
 DP1059641	HISTORICAL	SURVEY	SUBDIVISION
 DP1059909	HISTORICAL	SURVEY	SUBDIVISION
 DP1087394	HISTORICAL	SURVEY	SUBDIVISION
 DP1103328	HISTORICAL	SURVEY	SUBDIVISION
DP1116519			
Lot(s): 101			
 DP786233	HISTORICAL	SURVEY	SUBDIVISION
DP1127174			
Lot(s): 23, 24, 25, 26, 27, 28, 29, 30, 31			
 DP800222	HISTORICAL	SURVEY	SUBDIVISION
 DP1059641	HISTORICAL	SURVEY	SUBDIVISION
 DP1059909	HISTORICAL	SURVEY	SUBDIVISION
 DP1087394	HISTORICAL	SURVEY	SUBDIVISION
 DP1103328	HISTORICAL	SURVEY	SUBDIVISION
 DP1110643	HISTORICAL	SURVEY	SUBDIVISION
DP1131080			
Lot(s): 34			
 DP800222	HISTORICAL	SURVEY	SUBDIVISION
 DP1059641	HISTORICAL	SURVEY	SUBDIVISION
 DP1059909	HISTORICAL	SURVEY	SUBDIVISION
 DP1087394	HISTORICAL	SURVEY	SUBDIVISION
 DP1103328	HISTORICAL	SURVEY	SUBDIVISION
 DP1110643	HISTORICAL	SURVEY	SUBDIVISION
 DP1127174	HISTORICAL	SURVEY	SUBDIVISION
DP1134815			
Lot(s): 70, 71			
 DP800222	HISTORICAL	SURVEY	SUBDIVISION
 DP1059641	HISTORICAL	SURVEY	SUBDIVISION
 DP1059909	HISTORICAL	SURVEY	SUBDIVISION
 DP1087394	HISTORICAL	SURVEY	SUBDIVISION
DP1140280			
Lot(s): 1			
 DP849972	HISTORICAL	SURVEY	SUBDIVISION

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















	Status	Surv/Comp	Purpose
DP1141845			
Lot(s): 36, 37, 38, 39			
 DP800222	HISTORICAL	SURVEY	SUBDIVISION
 DP1059641	HISTORICAL	SURVEY	SUBDIVISION
 DP1059909	HISTORICAL	SURVEY	SUBDIVISION
 DP1087394	HISTORICAL	SURVEY	SUBDIVISION
 DP1103328	HISTORICAL	SURVEY	SUBDIVISION
 DP1110643	HISTORICAL	SURVEY	SUBDIVISION
 DP1127174	HISTORICAL	SURVEY	SUBDIVISION
 DP1131080	HISTORICAL	SURVEY	SUBDIVISION
DP1142384			
Lot(s): 87, 88, 89, 90, 94, 95			
 DP714300	HISTORICAL	SURVEY	SUBDIVISION
 DP1062248	HISTORICAL	SURVEY	SUBDIVISION
 DP1064961	HISTORICAL	SURVEY	SUBDIVISION
 DP1092921	HISTORICAL	SURVEY	SUBDIVISION
 DP1113129	HISTORICAL	SURVEY	SUBDIVISION
 DP1123022	HISTORICAL	SURVEY	SUBDIVISION
 DP1137188	HISTORICAL	SURVEY	SUBDIVISION
DP1142899			
Lot(s): 231, 232, 233			
 DP800222	HISTORICAL	SURVEY	SUBDIVISION
 DP1059641	HISTORICAL	SURVEY	SUBDIVISION
 DP1059909	HISTORICAL	SURVEY	SUBDIVISION
 DP1087394	HISTORICAL	SURVEY	SUBDIVISION
 DP1103328	HISTORICAL	SURVEY	SUBDIVISION
 DP1110643	HISTORICAL	SURVEY	SUBDIVISION
 DP1127174	HISTORICAL	SURVEY	SUBDIVISION
 DP1131080	HISTORICAL	SURVEY	SUBDIVISION
DP1146267			
Lot(s): 4, 5			
 DP786233	HISTORICAL	SURVEY	SUBDIVISION
 DP1116519	HISTORICAL	SURVEY	SUBDIVISION
DP1148489			
Lot(s): 83			
 DP1228360	REGISTERED	SURVEY	ROADS ACT, 1993
 LOT 83 DP1148489 IS REQUIRED FOR ROAD PURPOSES - SEE AF485750			
Lot(s): 85			
 LOT 85 DP1148489 IS REQUIRED FOR ROAD PURPOSES VIDE AF510625			
DP1149746			
Lot(s): 1, 2			
 DP786233	HISTORICAL	SURVEY	SUBDIVISION
 DP1116519	HISTORICAL	SURVEY	SUBDIVISION
 DP1146267	HISTORICAL	SURVEY	SUBDIVISION
DP1149824			
Lot(s): 5			
 DP833580	HISTORICAL	SURVEY	SUBDIVISION
DP1154403			
Lot(s): 101			
 DP1149824	HISTORICAL	SURVEY	ROADS ACT, 1993
DP1160124			
Lot(s): 2, 3			
 DP714300	HISTORICAL	SURVEY	SUBDIVISION

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
	Status	Surv/Comp	Purpose
DP1160866 Lot(s): 161, 162			
 DP800222	HISTORICAL	SURVEY	SUBDIVISION
 DP1059641	HISTORICAL	SURVEY	SUBDIVISION
 DP1059909	HISTORICAL	SURVEY	SUBDIVISION
 DP1087394	HISTORICAL	SURVEY	SUBDIVISION
 DP1103328	HISTORICAL	SURVEY	SUBDIVISION
 DP1110643	HISTORICAL	SURVEY	SUBDIVISION
DP1163949 Lot(s): 2030			
 DP1148524	HISTORICAL	SURVEY	ROADS ACT, 1993
DP1174025 Lot(s): 1, 2			
 DP714300	HISTORICAL	SURVEY	SUBDIVISION
 DP1062248	HISTORICAL	SURVEY	SUBDIVISION
DP1182434 Lot(s): 41, 42			
 DP747586	HISTORICAL	SURVEY	SUBDIVISION
DP1184040 Lot(s): 21, 22			
 DP714300	HISTORICAL	SURVEY	SUBDIVISION
DP1192337 Lot(s): 1, 2			
 DP714300	HISTORICAL	SURVEY	SUBDIVISION
 DP1160124	HISTORICAL	SURVEY	SUBDIVISION
DP1194281 Lot(s): 125			
 DP714300	HISTORICAL	SURVEY	SUBDIVISION
 DP1062248	HISTORICAL	SURVEY	SUBDIVISION
 DP1064961	HISTORICAL	SURVEY	SUBDIVISION
 DP1092921	HISTORICAL	SURVEY	SUBDIVISION
 DP1113129	HISTORICAL	SURVEY	SUBDIVISION
 DP1123022	HISTORICAL	SURVEY	SUBDIVISION
 DP1137188	HISTORICAL	SURVEY	SUBDIVISION
 DP1142384	HISTORICAL	SURVEY	SUBDIVISION
 DP1157019	HISTORICAL	SURVEY	SUBDIVISION
 DP1173614	HISTORICAL	SURVEY	SUBDIVISION
 DP1186068	HISTORICAL	SURVEY	SUBDIVISION
DP1200245 Lot(s): 71, 72			
 DP874501	HISTORICAL	SURVEY	SUBDIVISION
 DP1012577	HISTORICAL	SURVEY	SUBDIVISION
 DP1014908	HISTORICAL	SURVEY	SUBDIVISION
 DP1031906	HISTORICAL	SURVEY	SUBDIVISION
 DP1060009	HISTORICAL	SURVEY	SUBDIVISION
DP1203254 Lot(s): 1, 2			
 DP1149824	HISTORICAL	SURVEY	ROADS ACT, 1993
DP1219390 Lot(s): 23, 24, 25			
 DP633281	HISTORICAL	SURVEY	SUBDIVISION
 DP1036615	HISTORICAL	SURVEY	SUBDIVISION
DP1219542 Lot(s): 14			
 NSW GAZ.	19-12-1930		Folio : 5015
CLOSED ROAD AFFECTING LAND SHADED BLUE IN CROWN PLAN 15911-1603			

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	Status	Surv/Comp	Purpose
DP1219952			
Lot(s): 1, 2			
 DP793555	HISTORICAL	SURVEY	SUBDIVISION
 DP837907	HISTORICAL	SURVEY	SUBDIVISION
 DP1095392	HISTORICAL	SURVEY	SUBDIVISION
 DP1137398	HISTORICAL	SURVEY	SUBDIVISION
DP1234961			
Lot(s): 40, 41			
 DP714300	HISTORICAL	SURVEY	SUBDIVISION
 DP1160124	HISTORICAL	SURVEY	SUBDIVISION
DP1239062			
Lot(s): 189			
 DP714300	HISTORICAL	SURVEY	SUBDIVISION
 DP1062248	HISTORICAL	SURVEY	SUBDIVISION
 DP1064961	HISTORICAL	SURVEY	SUBDIVISION
 DP1092921	HISTORICAL	SURVEY	SUBDIVISION
 DP1113129	HISTORICAL	SURVEY	SUBDIVISION
 DP1123022	HISTORICAL	SURVEY	SUBDIVISION
 DP1137188	HISTORICAL	SURVEY	SUBDIVISION
 DP1142384	HISTORICAL	SURVEY	SUBDIVISION
 DP1157019	HISTORICAL	SURVEY	SUBDIVISION
 DP1173614	HISTORICAL	SURVEY	SUBDIVISION
 DP1186068	HISTORICAL	SURVEY	SUBDIVISION
 DP1194281	HISTORICAL	SURVEY	SUBDIVISION
 DP1210279	HISTORICAL	SURVEY	SUBDIVISION
 DP1213734	HISTORICAL	SURVEY	SUBDIVISION
 DP1224342	HISTORICAL	SURVEY	SUBDIVISION
 DP1231537	HISTORICAL	SURVEY	SUBDIVISION
DP1248074			
Lot(s): 24, 25			
 DP714300	HISTORICAL	SURVEY	SUBDIVISION
 DP1184040	HISTORICAL	SURVEY	SUBDIVISION
DP1254869			
Lot(s): 3, 4, 5			
 DP714300	HISTORICAL	SURVEY	SUBDIVISION
 DP1184040	HISTORICAL	SURVEY	SUBDIVISION
 DP1248074	HISTORICAL	SURVEY	SUBDIVISION
Road			
Polygon Id(s): 174049805			
 NSW GAZ.	27-05-2016	Folio : 1181	
ACQUIRED FOR THE PURPOSES OF THE ROADS ACT, 1993			
LOT 1 DP554853			
 NSW GAZ.	27-05-2016	Folio : 1181	
DEDICATED PUBLIC ROAD			
LOT 1 DP554853			
SP60091			
 DP702295	HISTORICAL	SURVEY	SUBDIVISION
SP64647			
 DP807579	HISTORICAL	SURVEY	SUBDIVISION
SP69771			
 DP250350	HISTORICAL	SURVEY	SUBDIVISION

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		<b>Status</b>	<b>Surv/Comp</b>	<b>Purpose</b>
SP70383	 DP828172	HISTORICAL	SURVEY	SUBDIVISION
	 DP1015166	HISTORICAL	COMPILATION	CONSOLIDATION
	 SP70620	WITHDRAWN	COMPILATION	STRATA SUBDIVISION PLAN
	 SP72022	REGISTERED	COMPILATION	STRATA SUBDIVISION PLAN
	 SP72563	REGISTERED	COMPILATION	STRATA SUBDIVISION PLAN
	 SP72857	REGISTERED	COMPILATION	STRATA SUBDIVISION PLAN
	 SP73837	REGISTERED	COMPILATION	STRATA SUBDIVISION PLAN
SP73636	 DP250350	HISTORICAL	SURVEY	SUBDIVISION
	 DP1074135	HISTORICAL	SURVEY	REDEFINITION
SP80963	 DP851843	HISTORICAL	SURVEY	SUBDIVISION
SP86975	 DP800222	HISTORICAL	SURVEY	SUBDIVISION
	 DP1059641	HISTORICAL	SURVEY	SUBDIVISION
	 DP1059909	HISTORICAL	SURVEY	SUBDIVISION
	 DP1087394	HISTORICAL	SURVEY	SUBDIVISION
	 DP1103328	HISTORICAL	SURVEY	SUBDIVISION
SP87589	 DP807579	HISTORICAL	SURVEY	SUBDIVISION
SP91784	 DP702295	HISTORICAL	SURVEY	SUBDIVISION
	 DP1205117	HISTORICAL	SURVEY	REDEFINITION
SP94940	 DP786233	HISTORICAL	SURVEY	SUBDIVISION
	 DP1116519	HISTORICAL	SURVEY	SUBDIVISION
	 DP1146267	HISTORICAL	SURVEY	SUBDIVISION
	 DP1149746	HISTORICAL	SURVEY	SUBDIVISION

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Plan	Surv/Comp	Purpose
DP3430	SURVEY	UNRESEARCHED
DP46696	SURVEY	SUBDIVISION
DP215006	SURVEY	SUBDIVISION
DP221841	SURVEY	SUBDIVISION
DP222691	SURVEY	SUBDIVISION
DP225161	SURVEY	SUBDIVISION
DP242839	SURVEY	RESUMPTION OR ACQUISITION
DP243058	SURVEY	SUBDIVISION
DP244028	SURVEY	SUBDIVISION
DP248848	SURVEY	SUBDIVISION
DP250350	SURVEY	SUBDIVISION
DP255635	SURVEY	SUBDIVISION
DP258391	SURVEY	SUBDIVISION
DP259757	SURVEY	ROAD OR MOTORWAY
DP260294	SURVEY	SUBDIVISION
DP261413	SURVEY	SUBDIVISION
DP261669	SURVEY	SUBDIVISION
DP261998	SURVEY	SUBDIVISION
DP262503	SURVEY	SUBDIVISION
DP263262	SURVEY	SUBDIVISION
DP519650	SURVEY	SUBDIVISION
DP550042	SURVEY	SUBDIVISION
DP559574	COMPILATION	SUBDIVISION
DP567045	COMPILATION	SUBDIVISION
DP589372	COMPILATION	SUBDIVISION
DP593944	SURVEY	SUBDIVISION
DP594529	SURVEY	SUBDIVISION
DP598369	SURVEY	SUBDIVISION
DP599515	SURVEY	SUBDIVISION
DP627948	COMPILATION	SUBDIVISION
DP632255	SURVEY	RESUMPTION OR ACQUISITION
DP702294	SURVEY	SUBDIVISION
DP702295	SURVEY	SUBDIVISION
DP702884	SURVEY	SUBDIVISION
DP704307	COMPILATION	CROWN FOLIO CREATION
DP713530	COMPILATION	CONSOLIDATION
DP714310	SURVEY	SUBDIVISION
DP726108	COMPILATION	DEPARTMENTAL
DP728227	COMPILATION	CROWN FOLIO CREATION
DP729129	SURVEY	CROWN FOLIO CREATION
DP747586	SURVEY	SUBDIVISION
DP749151	SURVEY	RESUMPTION OR ACQUISITION
DP752853	COMPILATION	CROWN ADMIN NO.
DP786233	SURVEY	SUBDIVISION
DP787792	COMPILATION	SUBDIVISION
DP791901	COMPILATION	SUBDIVISION
DP793515	SURVEY	SUBDIVISION
DP802353	SURVEY	SUBDIVISION
DP804429	SURVEY	SUBDIVISION
DP807579	SURVEY	SUBDIVISION
DP808207	SURVEY	SUBDIVISION
DP808251	SURVEY	SUBDIVISION
DP813721	SURVEY	RESUMPTION OR ACQUISITION
DP816716	SURVEY	RESUMPTION OR ACQUISITION
DP820609	SURVEY	CROWN FOLIO CREATION
DP821658	COMPILATION	CROWN FOLIO CREATION
DP822826	SURVEY	CROWN FOLIO CREATION
DP825540	SURVEY	RESUMPTION OR ACQUISITION
DP828172	SURVEY	SUBDIVISION
DP830936	SURVEY	SUBDIVISION
DP832086	SURVEY	SUBDIVISION
DP835020	SURVEY	SUBDIVISION
DP836356	SURVEY	SUBDIVISION
DP837907	SURVEY	SUBDIVISION
DP840260	SURVEY	SUBDIVISION

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<b>Plan</b>	<b>Surv/Comp</b>	<b>Purpose</b>
DP841096	COMPILATION	CONSOLIDATION
DP849972	SURVEY	SUBDIVISION
DP851843	SURVEY	SUBDIVISION
DP857367	SURVEY	SUBDIVISION
DP859080	SURVEY	SUBDIVISION
DP862184	SURVEY	SUBDIVISION
DP864154	SURVEY	SUBDIVISION
DP867117	SURVEY	SUBDIVISION
DP869815	SURVEY	SUBDIVISION
DP873485	COMPILATION	PRIMARY APPLN NON SUBDIVISION
DP874273	SURVEY	SUBDIVISION
DP874501	SURVEY	SUBDIVISION
DP877179	SURVEY	SUBDIVISION
DP877507	SURVEY	SUBDIVISION
DP1012577	SURVEY	SUBDIVISION
DP1014908	SURVEY	SUBDIVISION
DP1023212	SURVEY	SUBDIVISION
DP1031906	SURVEY	SUBDIVISION
DP1036615	SURVEY	SUBDIVISION
DP1037815	SURVEY	SUBDIVISION
DP1038635	SURVEY	SUBDIVISION
DP1054457	COMPILATION	DEPARTMENTAL
DP1054530	COMPILATION	DEPARTMENTAL
DP1054532	COMPILATION	DEPARTMENTAL
DP1054542	COMPILATION	DEPARTMENTAL
DP1054587	COMPILATION	DEPARTMENTAL
DP1055418	COMPILATION	DEPARTMENTAL
DP1058576	COMPILATION	DEPARTMENTAL
DP1059909	SURVEY	SUBDIVISION
DP1060009	SURVEY	SUBDIVISION
DP1062248	SURVEY	SUBDIVISION
DP1064162	SURVEY	SUBDIVISION
DP1064961	SURVEY	SUBDIVISION
DP1071188	SURVEY	SUBDIVISION
DP1078521	SURVEY	SUBDIVISION
DP1080111	SURVEY	SUBDIVISION
DP1087394	SURVEY	SUBDIVISION
DP1090723	SURVEY	ROADS ACT, 1993
DP1090917	SURVEY	SUBDIVISION
DP1091439	SURVEY	SUBDIVISION
DP1092921	SURVEY	SUBDIVISION
DP1103328	SURVEY	SUBDIVISION
DP1110643	SURVEY	SUBDIVISION
DP1116519	SURVEY	SUBDIVISION
DP1127174	SURVEY	SUBDIVISION
DP1131080	SURVEY	SUBDIVISION
DP1134815	SURVEY	SUBDIVISION
DP1140280	SURVEY	SUBDIVISION
DP1141845	SURVEY	SUBDIVISION
DP1142384	SURVEY	SUBDIVISION
DP1142899	SURVEY	SUBDIVISION
DP1143755	SURVEY	ROADS ACT, 1993
DP1146267	SURVEY	SUBDIVISION
DP1148489	SURVEY	ROADS ACT, 1993
DP1149746	SURVEY	SUBDIVISION
DP1149824	SURVEY	ROADS ACT, 1993
DP1154403	SURVEY	ROADS ACT, 1993
DP1157907	SURVEY	ROADS ACT, 1993
DP1160124	SURVEY	SUBDIVISION
DP1160866	SURVEY	SUBDIVISION
DP1163949	SURVEY	ROADS ACT, 1993
DP1174025	SURVEY	SUBDIVISION
DP1182434	SURVEY	SUBDIVISION
DP1184040	SURVEY	SUBDIVISION
DP1192337	SURVEY	SUBDIVISION
DP1194281	SURVEY	SUBDIVISION

**Caution:** This information is provided as a searching aid only. Whilst every endeavour is made to ensure that current map, plan and titling information is accurately reflected, the Registrar General cannot guarantee the information provided. For **ALL**

**ACTIVITY PRIOR TO SEPTEMBER 2002** you must refer to the RGs Charting and Reference Maps.

<b>Plan</b>	<b>Surv/Comp</b>	<b>Purpose</b>
DP1200245	SURVEY	SUBDIVISION
DP1203254	SURVEY	SUBDIVISION
DP1219390	SURVEY	SUBDIVISION
DP1219542	COMPILATION	CROWN LAND CONVERSION
DP1219952	SURVEY	SUBDIVISION
DP1234961	SURVEY	SUBDIVISION
DP1239062	SURVEY	SUBDIVISION
DP1248074	SURVEY	SUBDIVISION
DP1254869	SURVEY	SUBDIVISION
SP32243	COMPILATION	STRATA PLAN
SP36355	COMPILATION	STRATA PLAN
SP43759	COMPILATION	STRATA PLAN
SP48718	COMPILATION	STRATA PLAN
SP50464	COMPILATION	STRATA PLAN
SP57565	COMPILATION	STRATA PLAN
SP60091	COMPILATION	STRATA PLAN
SP64647	COMPILATION	STRATA PLAN
SP69771	COMPILATION	STRATA PLAN
SP70383	COMPILATION	STRATA PLAN
SP73636	COMPILATION	STRATA PLAN
SP80963	COMPILATION	STRATA PLAN
SP86975	COMPILATION	STRATA PLAN
SP87589	COMPILATION	STRATA PLAN
SP91784	COMPILATION	STRATA PLAN
SP94940	COMPILATION	STRATA PLAN

**Caution:** This information is provided as a searching aid only. Whilst every endeavour is made to ensure that current map, plan and titling information is accurately reflected, the Registrar General cannot guarantee the information provided. For **ALL** **ACTIVITY PRIOR TO SEPTEMBER 2002** you must refer to the RGs Charting and Reference Maps.



11927 216

NEW SOUTH WALES

**CERTIFICATE OF TITLE**  
PROPERTY ACT, 1900, as amended.

Appln. No. 49059 (part)  
For Crown Grants see Schedule  
Prior Titles (part)  
Vol. 718 Fol. 36  
Vol. 4640 Fol. 51  
Vol. 5919 Fol. 63  
Vol. 7098 Fols. 10 and 11  
Vol. 8104 Fol. 153

Vol. **11927** Fol. **216**

Edition issued 15-9-1972

**CANCELLED**



I certify that the person described in the First Schedule is the registered proprietor of the undermentioned estate in the land within described subject nevertheless to such exceptions encumbrances and interests as are shown in the Second Schedule.

Witness *Barnes*

*Jawatson*  
Registrar General.



11927 Fol. 216  
(Page 1) Vol.

ESTATE AND LAND REFERRED TO

Estate in Fee Simple in Lot 1 in Deposited Plan 227586 at Woolgoolga in the Shire of Coffs Harbour Parish of Woogoolga and County of Fitzroy being the lands granted by the Crown Grants set out in the Schedule hereunder and land for which no Crown Grant has issued. EXCEPTING THEREOUT the minerals reserved by the Crown Grants and the minerals specified in Section 141 Public Works Act 1912 as regards the parts comprised in Resumption No. K625423.

SCHEDULE OF GRANTS

Number of Portion	Grant Reference	
	Volume	Folio
Pt. 4	699	137
Pt. 6	1635	35
Pt. 7	1886	109
Pt. 8	1886	110
Pt. 1ac. 3rd. 30per.	5085	208
Pt. 1ac. 1rd. 10per.	8104	153

FIRST SCHEDULE

THE MINISTER FOR PUBLIC WORKS.

*Jawatson*  
Registrar General.

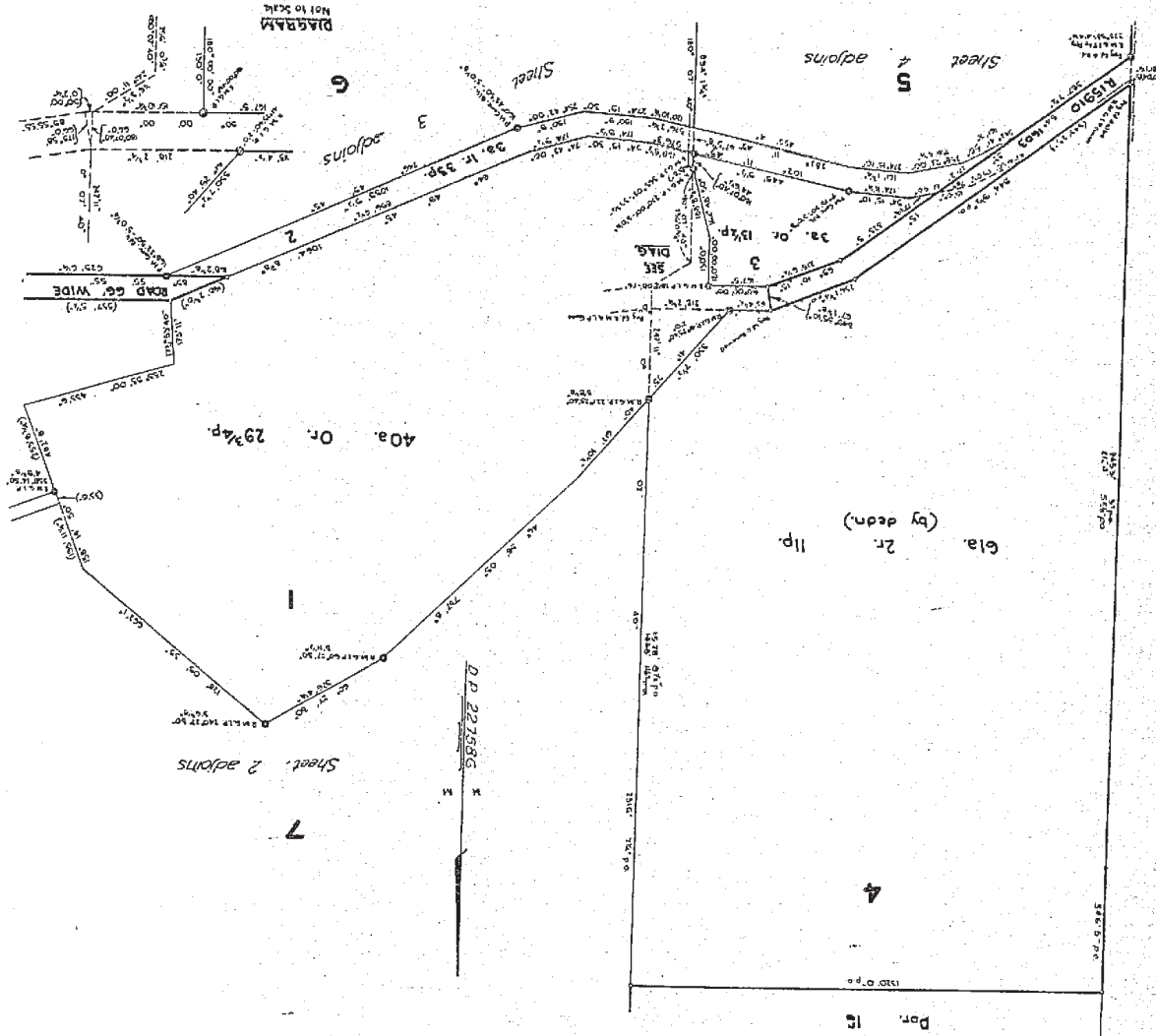
SECOND SCHEDULE

NIL.

*Jawatson*  
Registrar General.

PERSONS ARE CAUTIONED AGAINST ALTERING OR ADDING TO THIS CERTIFICATE OR ANY NOTIFICATION HEREON

WARNING: THIS DOCUMENT MUST NOT BE REMOVED FROM THE LAND TITLES OFFICE.



(Page 3 of 4 pages)

P23557/16  
 - 55676  
 44679  
 P.P. 20237  
 CT/15/75

FIRST SCHEDULE (continued)

REGISTERED PROPRIETOR		INSTRUMENT NUMBER		DATE		ENTERED		SIGNATURE OF REGISTRAR GENERAL	
NATURE									
<p>This deed is cancelled as to the whole                      New Certificates of Title have issued on 29-1-76                      for lot: in Deposited plan No 242839 as follows:-                      Lots 1 Vol. 1297 Fol. 43 respectively.                      Lot 4 Vol. 1097 Fol. 144                      Lots 5, 7, 12, 17, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000</p>									



*J. Jackson*  
 REGISTRAR GENERAL

SECOND SCHEDULE (continued)

REGISTERED PROPRIETOR		INSTRUMENT NUMBER		DATE		ENTERED		SIGNATURE OF REGISTRAR GENERAL	
NATURE									
PARTICULARS									
CANCELLATION									

NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SEAL OF THE REGISTRAR GENERAL ARE CANCELLED







12977/151

# CERTIFICATE OF TITLE

NEW SOUTH WALES

Crown Grants Vol. 1886 Fols.109 and 110

Prior Title Vol.11927 Fol. 216

PROPERTY ACT, 1900

Vol. **12977** Fol. **151**

EDITION ISSUED

29 | 1976



12977 Fol. 151

I certify that the person described in the First Schedule is the registered proprietor of the undermentioned estate in the land within described subject nevertheless to such exceptions encumbrances and interests as are shown in the Second Schedule.

*Jarvis*  
 Registrar General.

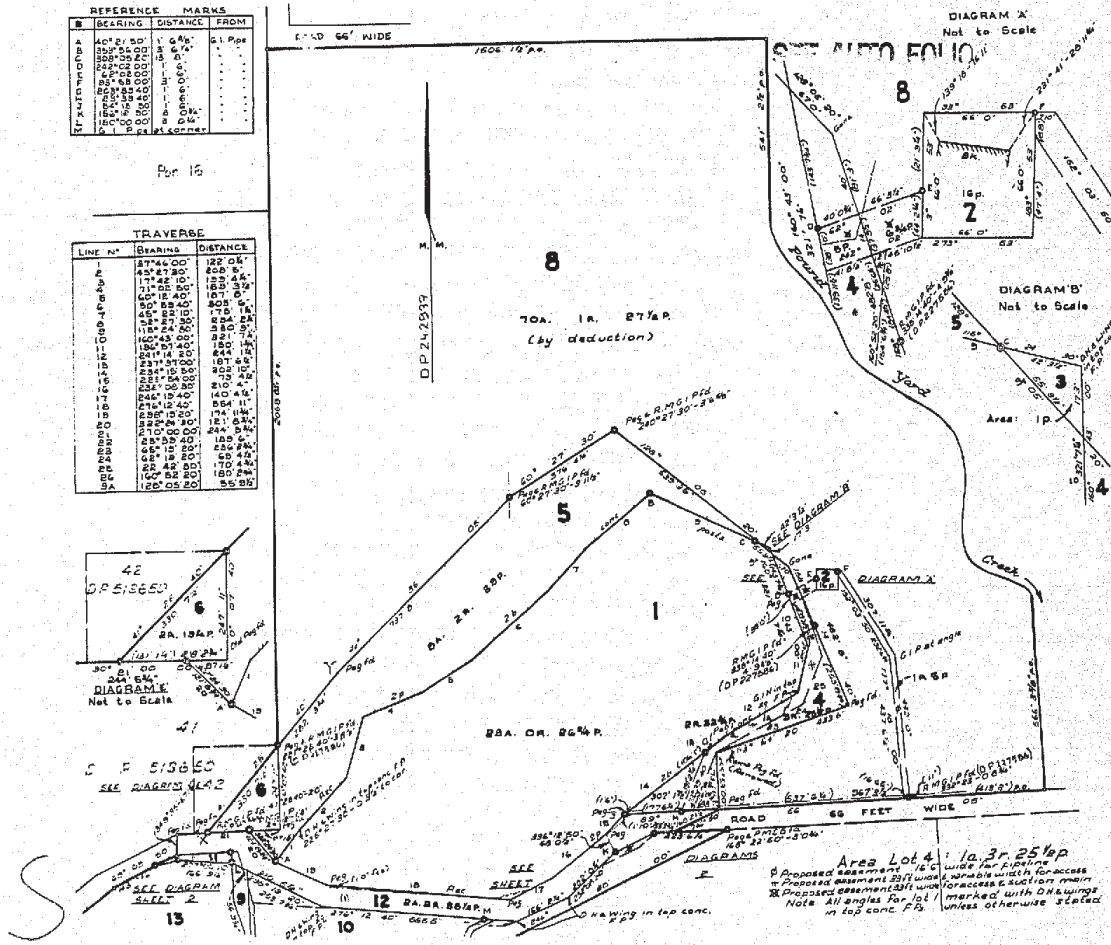


PLAN SHOWING LOCATION OF LAND

**CANCELLED**

PERSONS ARE CAUTIONED AGAINST ALTERING OR ADDING TO THIS CERTIFICATE OR ANY NOTIFICATION HEREON

WARNING: THIS DOCUMENT MUST NOT BE REMOVED FROM THE LAND TILES OFFICE.



**ESTATE AND LAND REFERRED TO**  
 Estate in Fee Simple in Lot 6 in Deposited Plan 242839 at Woolgoolga in the Shire of Coffs Harbour Parish of Woogoolga and County of Fitzroy. EXCEPTING THEREOUT the minerals reserved by the Crown Grants.

**FIRST SCHEDULE**  
 THE MINISTER FOR PUBLIC WORKS.  
 GRM

**SECOND SCHEDULE**  
 1. Reservations and conditions, if any, contained in the Crown Grants above referred to.



# CERTIFICATE OF TITLE



13024-214

NEW SOUTH WALES

PROPERTY ACT, 1900

Crown Grants Vol. 1635 Fol.35  
Vol. 8104 Fol.153  
Prior Titles Vol. 5919 Fol. 63  
Vol. 8104 Fol.153  
Vol.12992 Fol. 80

Vol. **13024** Fol. **214**

EDITION ISSUED

24 6 1976



I certify that the person described in the First Schedule is the registered proprietor of the undermentioned land and the land described subject nevertheless to such exceptions encumbrances and interests as are shown in the Second Schedule.

**CANCELLED**

*Jawaton*  
**REGISTRAR GENERAL**



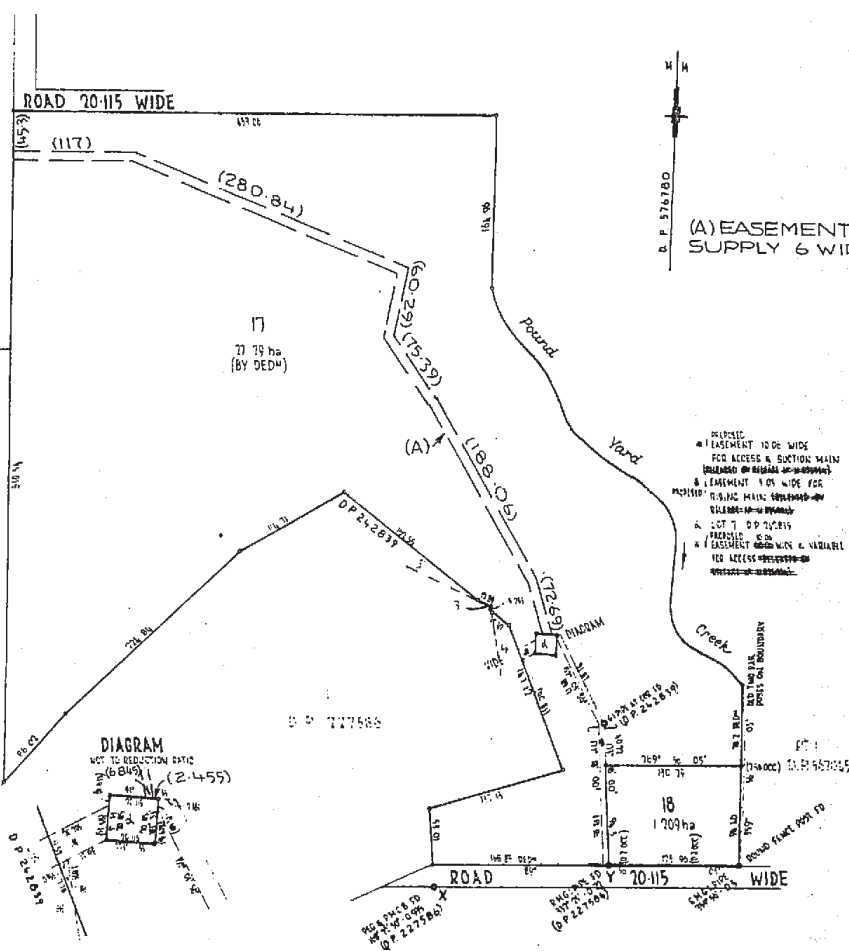
13024 Fol. 214

(Page 1) Vol.



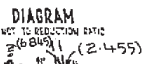
## PLAN SHOWING LOCATION OF LAND

LENGTHS ARE IN METRES



(A) EASEMENT FOR WATER SUPPLY 6 WIDE - R849006

PROPOSED EASEMENT TO BE WIDE FOR ACCESS & SECTION WHEN (INCLUDED OR EXCLUDED OR OTHERWISE) & EASEMENT 405 WIDE FOR PROPOSED EASING MAIL DELIVERY AND TELEPHONE WIRE ROUTING & LOT 7 DP 212815 PROPOSED EASING 6 WIDE & VARIABLE FOR ACCESS PROPOSED OR OTHERWISE



### ESTATE AND LAND REFERRED TO

Estate in Fee Simple in Lot 17 in Deposited Plan 576780 at Woolgoolga in the Shire of Coffs Harbour Parish of Woolgoolga and County of Fitzroy. EXCEPTING THEREOUT the minerals reserved by the Crown Grants of Portion 6 and 5311 square metres respectively.

### FIRST SCHEDULE

~~JOHN LEHMANN of Woolgoolga, Farmer to the part of the land above described formerly comprised in Certificate of Title Volume 5919 Folio 63 and Volume 8104 Folio 153 and THE MINISTER FOR PUBLIC WORKS as to the part formerly comprised in Certificate of Title Volume 12992 Folio 80.~~

### SECOND SCHEDULE

GRN  
AA  
AB

1. Reservations and conditions, if any, contained in the Crown Grants above referred to as regards the part of the land formerly comprised in Certificates of Title Volume 5919 Folio 63 and Volume 8104 Folio 153.
2. As to boundaries to rivers see Section 235A Crown Lands Consolidation Act, 1913, as regards the part of the land above described formerly comprised in Certificate of Title Volume 8104 Folio 153.

NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SEAL OF THE REGISTRAR GENERAL ARE CANCELLED.

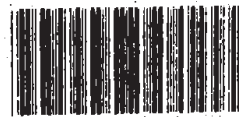
WARNING: THIS DOCUMENT MUST NOT BE REMOVED FROM THE LAND TITLES OFFICE.

PERSONS ARE CAUTIONED AGAINST ALTERING OR ADDING TO THIS CERTIFICATE OR ANY NOTIFICATION HEREON



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2  
100339



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**TRANSFER**  
REAL PROPERTY ACT, 1900

T

CB	1 of 2
\$	44.

R 1/2

DESCRIPTION OF LAND Note (a)

Torrens Title Reference	If Part Only, Delete Whole and Give Details	Location
<b>IDENTIFIER 20/800222</b>	WHOLE	<b>at WOOLGOOLGA</b>

TRANSFEROR Note (b)

**JOHN LEHMAN**

ESTATE Note (c)

(the abovenamed TRANSFEROR) hereby acknowledges receipt of the consideration of \$ **1,100,000.00** and transfers an estate in fee simple in the land above described to the TRANSFEREE

TRANSFEREE Note (d)

<b>GABAZO PTY LIMITED</b> a Company duly incorporated and having its Registered Office at 35 Gordon Street Woolgoolga	OFFICE USE ONLY
as joint tenants/tenants in common	S

TENANCY Note (e)

PRIOR ENCUMBRANCES Note (f)

subject to the following PRIOR ENCUMBRANCES 1. .... 2. .... 3. ....

DATE 14th June, 1990

We hereby certify this dealing to be correct for the purposes of the Real Property Act, 1900.

EXECUTION Note (g)

Signed in my presence by the transferor who is personally known to me

Signature of Witness: *[Signature]*  
 Name of Witness (BLOCK LETTERS): **SAW TICLI**  
 Address and occupation of Witness: **Solicitor**  
**COFFEES HARBOUR**

Signature of Transferor: *[Signature]*

Note (g)

Signed in my presence by the transferee who is personally known to me

Signature of Witness: .....  
 Name of Witness (BLOCK LETTERS): .....  
 Address and occupation of Witness: .....

(R.K. DHALIWAL)  
Solicitor for

Signature of Transferee: *[Signature]*

572

TO BE COMPLETED BY LODGING PARTY Notes (h) and (i)

LODGED BY		LOCATION OF DOCUMENTS	
<div style="border: 1px solid black; padding: 5px; text-align: center;"> <b>L. J. KANE &amp; CO.</b> RGO Box 30P                 </div>		CT	OTHER
		<input checked="" type="checkbox"/>	<input type="checkbox"/>
		Herewith.	
Ref: Delivery Box Number		<input type="checkbox"/>	<input type="checkbox"/>
		In L.T.O. with	
		Produced by	
Checked	Passed	REGISTERED	-19
ECT	R7	5 JUL 1990	
Signed	Extra Fee	Secondary Directions	
		Delivery Directions	

OFFICE USE ONLY

Handwritten initials and signature





NEW SOUTH WALES LAND REGISTRY SERVICES - HISTORICAL SEARCH

SEARCH DATE

16/7/2019 2:21PM

FOLIO: 20/800222

First Title(s): VOL 699 FOL 137 VOL 1635 FOL 35
VOL 1886 FOL 109 VOL 8104 FOL 153
VOL 10451 FOL 64
Prior Title(s): 4-6/242839 17/576780
72/752853

Table with 4 columns: Recorded, Number, Type of Instrument, C.T. Issue. Rows include instrument details like 'DEPOSITED PLAN', 'APPLICATION FOR REMOVAL OF RESTRICTIONS', 'TRANSFER MORTGAGE', 'DISCHARGE OF MORTGAGE', and 'DEPOSITED PLAN'.

\*\*\* END OF SEARCH \*\*\*





NEW SOUTH WALES LAND REGISTRY SERVICES - HISTORICAL SEARCH  
-----

SEARCH DATE  
-----

16/7/2019 2:19PM

FOLIO: 202/874273  
-----

First Title(s): VOL 699 FOL 137  
Prior Title(s): 20/800222

Recorded -----	Number -----	Type of Instrument -----	C.T. Issue -----
21/1/1998	DP874273	DEPOSITED PLAN	FOLIO CREATED EDITION 1
25/6/2004	AA749119	CAVEAT	
23/3/2006	AC81176	WITHDRAWAL OF CAVEAT	
23/3/2006	AC81177	DISCHARGE OF MORTGAGE	
23/3/2006	AC81178	APPLICATION	EDITION 2
11/4/2006	AC235056	CAVEAT	
29/12/2006	AC756694	APPLICATION FOR PREPARATION OF LAPSING NOTICE	
28/8/2008	AE176836	CAVEAT	
18/12/2012	AH445844	DEPARTMENTAL DEALING	
17/10/2013	AI94079	DEPARTMENTAL DEALING	
20/7/2018	AN413783	APPLICATION FOR PREPARATION OF LAPSING NOTICE	

\*\*\* END OF SEARCH \*\*\*

advlegs

PRINTED ON 16/7/2019



NEW SOUTH WALES LAND REGISTRY SERVICES - TITLE SEARCH

FOLIO: 202/874273

SEARCH DATE	TIME	EDITION NO	DATE
16/7/2019	2:19 PM	2	23/3/2006

LAND

LOT 202 IN DEPOSITED PLAN 874273
AT WOOLGOOLGA
LOCAL GOVERNMENT AREA COFFS HARBOUR
PARISH OF WOOLGOOLGA COUNTY OF FITZROY
TITLE DIAGRAM DP874273

FIRST SCHEDULE

VADEJIL PTY LIMITED (AP AC81178)

SECOND SCHEDULE (4 NOTIFICATIONS)

- \* 1 LAND EXCLUDES MINERALS AND IS SUBJECT TO RESERVATIONS AND CONDITIONS IN FAVOUR OF THE CROWN WITHIN THE PART(S) SHOWN SO INDICATED IN THE TITLE DIAGRAM - SEE CROWN GRANTS
\* 2 LAND EXCLUDES MINERALS (S.141 PUBLIC WORKS ACT, 1912) AFFECTING THE LAND SHOWN SO INDICATED IN THE TITLE DIAGRAM
3 EASEMENT(S) AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM CREATED BY:
R849006 FOR WATER SUPPLY 6 WIDE
4 W99139 COVENANT AFFECTING THE PART SHOWN SO BURDENED IN THE TITLE DIAGRAM.

NOTATIONS

UNREGISTERED DEALINGS: NIL

\*\*\* END OF SEARCH \*\*\*

advlegs

PRINTED ON 16/7/2019

# Appendix B

## Lotsearch Report



# LOTSEARCH

LOTSEARCH ENVIRO LITE

**Date: 17 Jul 2019 13:41:12**

**Reference: LS007441 EL**

**Address: Newmans Road & Barkhut Road, Woolgoolga, NSW 2456**

**Disclaimer:**

The purpose of this report is to provide an overview of some of the site history, environmental risk and planning information available, affecting an individual address or geographical area in which the property is located. It is not a substitute for an on-site inspection or review of other available reports and records. It is not intended to be, and should not be taken to be, a rating or assessment of the desirability or market value of the property or its features.

You should obtain independent advice before you make any decision based on the information within the report.

The detailed terms applicable to use of this report are set out at the end of this report.

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## Location Confidences

Where Lotsearch has had to georeference features from supplied addresses, a location confidence has been assigned to the data record. This indicates a confidence to the positional accuracy of the feature. Where applicable, a code is given under the field heading “LC” or “LocConf”. These codes lookup to the following location confidences:

LC Code	Location Confidence
Premise match	Georeferenced to the site location / premise or part of site
General area or suburb match	Georeferenced with the confidence of the general/approximate area
Road match	Georeferenced to the road or rail
Road intersection	Georeferenced to the road intersection
Feature is a buffered point	Feature is a buffered point
Land adjacent to geocoded site	Land adjacent to Georeferenced Site
Network of features	Georeferenced to a network of features

## Dataset Listing

Datasets contained within this report, detailing their source and data currency:

Dataset Name	Custodian	Supply Date	Currency Date	Update Frequency	Dataset Buffer (m)	No. Features Onsite	No. Features within 100m	No. Features within Buffer
Cadastre Boundaries	NSW Department of Finance, Services & Innovation	17/07/2019	17/07/2019	Daily	-	-	-	-
Topographic Data	NSW Department of Finance, Services & Innovation	11/04/2019	10/04/2019	As required	-	-	-	-
List of NSW contaminated sites notified to EPA	Environment Protection Authority	21/06/2019	19/06/2019	Monthly	1000	0	0	1
Contaminated Land Records of Notice	Environment Protection Authority	10/07/2019	10/07/2019	Monthly	1000	0	0	0
Former Gasworks	Environment Protection Authority	01/07/2019	11/10/2017	Monthly	1000	0	0	0
National Waste Management Facilities Database	Geoscience Australia	07/05/2019	07/03/2017	Quarterly	1000	0	0	0
EPA PFAS Investigation Program	Environment Protection Authority	01/07/2019	01/07/2019	Monthly	2000	0	0	0
Defence PFAS Investigation & Management Program	Department of Defence	01/07/2019	01/07/2019	Monthly	2000	0	0	0
Airservices Australia National PFAS Management Program	Airservices Australia	01/07/2019	01/07/2019	Monthly	2000	0	0	0
Defence 3 Year Regional Contamination Investigation Program	Department of Defence	01/07/2019	01/07/2019	Monthly	2000	0	0	0
EPA Other Sites with Contamination Issues	Environment Protection Authority	13/12/2018	13/12/2018	Annually	1000	0	0	0
Licensed Activities under the POEO Act 1997	Environment Protection Authority	27/06/2019	27/06/2019	Monthly	1000	0	0	1
Delicensed POEO Activities still regulated by the EPA	Environment Protection Authority	27/06/2019	27/06/2019	Monthly	1000	0	0	1
Former POEO Licensed Activities now revoked or surrendered	Environment Protection Authority	27/06/2019	27/06/2019	Monthly	1000	3	3	6
UPSS Environmentally Sensitive Zones	Environment Protection Authority	14/04/2015	12/01/2010	As required	1000	1	1	1
UBD Business Directory 1982 (Premise & Intersection Matches)	Hardie Grant			Not required	150	0	0	0
UBD Business Directory 1982 (Road & Area Matches)	Hardie Grant			Not required	150	-	13	13
UBD Business Directory 1970 (Premise & Intersection Matches)	Hardie Grant			Not required	150	0	0	0
UBD Business Directory 1970 (Road & Area Matches)	Hardie Grant			Not required	150	-	27	27
UBD Business Directory 1961 (Premise & Intersection Matches)	Hardie Grant			Not required	150	0	0	0
UBD Business Directory 1961 (Road & Area Matches)	Hardie Grant			Not required	150	-	21	21
UBD Business Directory 1950 (Premise & Intersection Matches)	Hardie Grant			Not required	150	0	0	0
UBD Business Directory 1950 (Road & Area Matches)	Hardie Grant			Not required	150	-	0	0
UBD Business Directory Drycleaners & Motor Garages/Service Stations (Premise & Intersection Matches)	Hardie Grant			Not required	500	0	0	0
UBD Business Directory Drycleaners & Motor Garages/Service Stations (Road & Area Matches)	Hardie Grant			Not required	500	-	10	10
Cattle dips of the Northern Rivers region	NSW Dept. of Primary Industries	29/11/2018	29/11/2018	Annually	1000	0	0	0
Points of Interest	NSW Department of Finance, Services & Innovation	11/04/2019	10/04/2019	Quarterly	1000	0	0	16
Tanks (Areas)	NSW Department of Finance, Services & Innovation	11/04/2019	11/04/2019	Quarterly	1000	0	0	0
Tanks (Points)	NSW Department of Finance, Services & Innovation	11/04/2019	10/04/2019	Quarterly	1000	0	0	0

Dataset Name	Custodian	Supply Date	Currency Date	Update Frequency	Dataset Buffer (m)	No. Features Onsite	No. Features within 100m	No. Features within Buffer
Major Easements	NSW Department of Finance, Services & Innovation	11/04/2019	11/04/2019	Quarterly	1000	0	0	4
State Forest	NSW Department of Finance, Services & Innovation	18/01/2018	18/01/2018	As required	1000	0	0	2
NSW National Parks and Wildlife Service Reserves	NSW Office of Environment & Heritage	16/01/2019	14/11/2018	Annually	1000	0	0	1
Hydrogeology Map of Australia	Commonwealth of Australia (Geoscience Australia)	08/10/2014	17/03/2000	As required	1000	1	1	2
Botany Groundwater Management Zones	NSW Department of Primary Industries	15/03/2018	01/10/2005	As required	1000	0	0	0
Groundwater Boreholes	NSW Dept. of Primary Industries - Water NSW; Commonwealth of Australia (Bureau of Meteorology)	24/07/2018	23/07/2018	Annually	2000	0	1	61
Geological Units 1:250,000	NSW Dept. of Industry, Resources & Energy	20/08/2014		None planned	1000	2	-	2
Geological Structures 1:250,000	NSW Dept. of Industry, Resources & Energy	20/08/2014		None planned	1000	0	-	4
Naturally Occurring Asbestos Potential	NSW Dept. of Industry, Resources & Energy	04/12/2015	24/09/2015	Unknown	1000	0	0	0
Soil Landscapes	NSW Office of Environment & Heritage	12/08/2014		None planned	1000	2	-	9
Atlas of Australian Soils	CSIRO	19/05/2017	17/02/2011	As required	1000	2	2	2
Environmental Planning Instrument Acid Sulfate Soils	NSW Department of Planning and Environment	15/07/2019	28/06/2019	Weekly	500	2	-	-
Atlas of Australian Acid Sulfate Soils	CSIRO	19/01/2017	21/02/2013	As required	1000	2	3	3
Dryland Salinity - National Assessment	National Land and Water Resources Audit	18/07/2014	12/05/2013	None planned	1000	0	0	0
Dryland Salinity Potential of Western Sydney	NSW Office of Environment & Heritage	12/05/2017	01/01/2002	None planned	1000	-	-	-
Mining Subsidence Districts	NSW Department of Finance, Services & Innovation	11/04/2019	11/04/2019	Quarterly	1000	0	0	0
Environmental Planning Instrument SEPP State Significant Precincts	NSW Department of Planning and Environment	15/07/2019	07/12/2018	Weekly	1000	0	0	0
Environmental Planning Instrument Land Zoning	NSW Department of Planning and Environment	15/07/2019	05/07/2019	Weekly	1000	2	10	51
Commonwealth Heritage List	Australian Government Department of the Environment and Energy - Heritage Branch	16/01/2019	31/07/2018	Unknown	1000	0	0	0
National Heritage List	Australian Government Department of the Environment and Energy - Heritage Branch	16/01/2019	28/09/2018	Unknown	1000	0	0	0
State Heritage Register - Curtilages	NSW Office of Environment & Heritage	15/07/2019	09/11/2018	Quarterly	1000	0	0	0
Environmental Planning Instrument Heritage	NSW Department of Planning and Environment	15/07/2019	28/06/2019	Weekly	1000	0	0	1
Bush Fire Prone Land	NSW Rural Fire Service	28/05/2019	05/04/2019	Quarterly	1000	3	3	3
Vegetation of Coffs Harbour LGA	NSW Office of Environment & Heritage	06/01/2016	31/12/2012	None planned	1000	5	8	19
Ramsar Wetlands of Australia	Commonwealth of Australia Department of the Environment	08/10/2014	24/06/2011	As required	1000	0	0	0
Groundwater Dependent Ecosystems	Bureau of Meteorology	14/08/2017	15/05/2017	Unknown	1000	2	2	5
Inflow Dependent Ecosystems Likelihood	Bureau of Meteorology	14/08/2017	15/05/2017	Unknown	1000	9	9	12
NSW BioNet Species Sightings	NSW Office of Environment & Heritage	17/07/2019	17/07/2019	Weekly	10000	-	-	-

# Aerial Imagery 2019

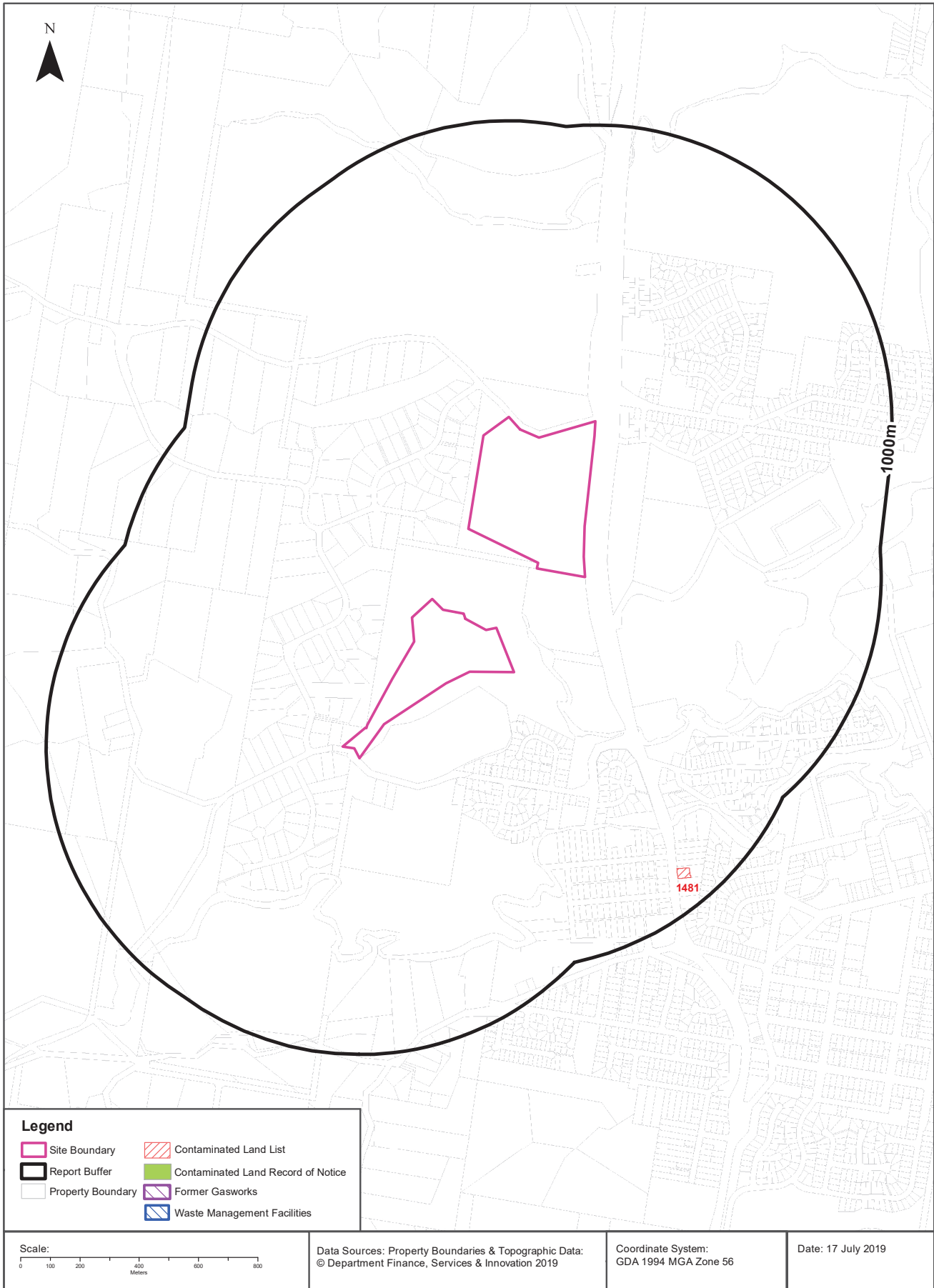
Newmans Road & Barkhut Road, Woolgoolga, NSW 2456





# Contaminated Land & Waste Management Facilities

Newmans Road & Barkhut Road, Woolgoolga, NSW 2456



# Contaminated Land & Waste Management Facilities

Newmans Road & Barkhut Road, Woolgoolga, NSW 2456

## List of NSW contaminated sites notified to EPA

Records from the NSW EPA Contaminated Land list within the dataset buffer:

Map Id	Site	Address	Suburb	Activity	Management Class	Status	Location Confidence	Dist (m)	Direction
1481	United Petroleum Service Station	56 Clarence Street	Woolgoolga	Service Station	Regulation under CLM Act not required	Current EPA List	Premise Match	861m	South East

The values within the EPA site management class in the table above, are given more detailed explanations in the table below:

EPA site management class	Explanation
Contamination being managed via the planning process (EP&A Act)	The EPA has completed an assessment of the contamination and decided that the contamination is significant enough to warrant regulation. The contamination of this site is managed by the consent authority under the Environmental Planning and Assessment Act 1979 (EP&A Act) planning approval process, with EPA involvement as necessary to ensure significant contamination is adequately addressed. The consent authority is typically a local council or the Department of Planning and Environment.
Contamination currently regulated under CLM Act	The EPA has completed an assessment of the contamination and decided that the contamination is significant enough to warrant regulation under the Contaminated Land Management Act 1997 (CLM Act). Management of the contamination is regulated by the EPA under the CLM Act. Regulatory notices are available on the EPA's Contaminated Land Public Record of Notices.
Contamination currently regulated under POEO Act	The EPA has completed an assessment of the contamination and decided that the contamination is significant enough to warrant regulation. Management of the contamination is regulated under the Protection of the Environment Operations Act 1997 (POEO Act). The EPA's regulatory actions under the POEO Act are available on the POEO public register.
Contamination formerly regulated under the CLM Act	The EPA has determined that the contamination is no longer significant enough to warrant regulation under the Contaminated Land Management Act 1997 (CLM Act). The contamination was addressed under the CLM Act.
Contamination formerly regulated under the POEO Act	The EPA has determined that the contamination is no longer significant enough to warrant regulation. The contamination was addressed under the Protection of the Environment Operations Act 1997 (POEO Act).
Contamination was addressed via the planning process (EP&A Act)	The EPA has determined that the contamination is no longer significant enough to warrant regulation. The contamination was addressed by the appropriate consent authority via the planning process under the Environmental Planning and Assessment Act 1979 (EP&A Act).
Ongoing maintenance required to manage residual contamination (CLM Act)	The EPA has determined that ongoing maintenance, under the Contaminated Land Management Act 1997 (CLM Act), is required to manage the residual contamination. Regulatory notices under the CLM Act are available on the EPA's Contaminated Land Public Record of Notices.
Regulation being finalised	The EPA has completed an assessment of the contamination and decided that the contamination is significant enough to warrant regulation under the Contaminated Land Management Act 1997. A regulatory approach is being finalised.
Regulation under the CLM Act not required	The EPA has completed an assessment of the contamination and decided that regulation under the Contaminated Land Management Act 1997 is not required.
Under assessment	The contamination is being assessed by the EPA to determine whether regulation is required. The EPA may require further information to complete the assessment. For example, the completion of management actions regulated under the planning process or Protection of the Environment Operations Act 1997. Alternatively, the EPA may require information via a notice issued under s77 of the Contaminated Land Management Act 1997 or issue a Preliminary Investigation Order.

NSW EPA Contaminated Land List Data Source: Environment Protection Authority  
 © State of New South Wales through the Environment Protection Authority

# Contaminated Land & Waste Management Facilities

Newmans Road & Barkhut Road, Woolgoolga, NSW 2456

## Contaminated Land: Records of Notice

Record of Notices within the dataset buffer:

Map Id	Name	Address	Suburb	Notices	Area No	Location Confidence	Distance	Direction
N/A	No records in buffer							

Contaminated Land Records of Notice Data Source: Environment Protection Authority  
© State of New South Wales through the Environment Protection Authority  
Terms of use and disclaimer for Contaminated Land: Record of Notices, please visit  
<http://www.epa.nsw.gov.au/clm/clmdisclaimer.htm>

## Former Gasworks

Former Gasworks within the dataset buffer:

Map Id	Location	Council	Further Info	Location Confidence	Distance	Direction
N/A	No records in buffer					

Former Gasworks Data Source: Environment Protection Authority  
© State of New South Wales through the Environment Protection Authority

## National Waste Management Site Database

Sites on the National Waste Management Site Database within the dataset buffer:

Site Id	Owner	Name	Address	Suburb	Class	Landfill	Reprocess	Transfer	Comments	Loc Conf	Dist (m)	Direction
N/A	No records in buffer											

Waste Management Facilities Data Source: Geoscience Australia  
Creative Commons 3.0 © Commonwealth of Australia <http://creativecommons.org/licenses/by/3.0/au/deed.en>

## PFAS Investigation Sites

Newmans Road & Barkhut Road, Woolgoolga, NSW 2456

### EPA PFAS Investigation Program

Sites that are part of the EPA PFAS investigation program, within the dataset buffer:

Id	Site	Address	Loc Conf	Dist	Dir
N/A	No records in buffer				

EPA PFAS Investigation Program: Environment Protection Authority  
© State of New South Wales through the Environment Protection Authority

### Defence PFAS Investigation & Management Program

Sites being investigated or managed by the Department of Defence for PFAS contamination within the dataset buffer:

Map ID	Base Name	Address	Loc Conf	Dist	Dir
N/A	No records in buffer				

Defence PFAS Investigation & Management Program Data Custodian: Department of Defence, Australian Government

### Airservices Australia National PFAS Management Program

Sites being investigated or managed by Airservices Australia for PFAS contamination within the dataset buffer:

Map ID	Site Name	Impacts	Loc Conf	Dist	Dir
N/A	No records in buffer				

Airservices Australia National PFAS Management Program Data Custodian: Airservices Australia

# Defence Sites

Newmans Road & Barkhut Road, Woolgoolga, NSW 2456

## Defence 3 Year Regional Contamination Investigation Program

Sites which have been assessed as part of the Defence 3 Year Regional Contamination Investigation Program within the dataset buffer:

Property ID	Base Name	Address	Known Contamination	Loc Conf	Dist	Dir
N/A	No records in buffer					

Defence 3 Year Regional Contamination Investigation Program, Data Custodian: Department of Defence, Australian Government

## EPA Other Sites with Contamination Issues

Newmans Road & Barkhut Road, Woolgoolga, NSW 2456

### EPA Other Sites with Contamination Issues

This dataset contains other sites identified on the EPA website as having contamination issues. This dataset currently includes:

- James Hardie asbestos manufacturing and waste disposal sites
- Radiological investigation sites in Hunter's Hill
- Pasmaico Lead Abatement Strategy Area

Sites within the dataset buffer:

Site Id	Site Name	Site Address	Dataset	Comments	Location Confidence	Distance	Direction
N/A	No records in buffer						

EPA Other Sites with Contamination Issues: Environment Protection Authority  
© State of New South Wales through the Environment Protection Authority

# Current EPA Licensed Activities

Newmans Road & Barkhut Road, Woolgoolga, NSW 2456



## EPA Activities

Newmans Road & Barkhut Road, Woolgoolga, NSW 2456

## Licensed Activities under the POEO Act 1997

Licensed activities under the Protection of the Environment Operations Act 1997, within the dataset buffer:

EPL	Organisation	Name	Address	Suburb	Activity	Loc Conf	Distance	Direction
20590	OHL CONSTRUCTION PACIFIC PTY LTD		Pacific Highway, WOOLGOOLGA, NSW 2456		Crushing, grinding or separating, Land- based extractive activity, Road construction	Road Match	901m	South West

POEO Licence Data Source: Environment Protection Authority  
© State of New South Wales through the Environment Protection Authority



# Delicensed & Former Licensed EPA Activities

Newmans Road & Barkhut Road, Woolgoolga, NSW 2456



## EPA Activities

Newmans Road & Barkhut Road, Woolgoolga, NSW 2456

### Delicensed Activities still regulated by the EPA

Delicensed activities still regulated by the EPA, within the dataset buffer:

Licence No	Organisation	Name	Address	Suburb	Activity	Loc Conf	Distance	Direction
4017	FORESTRY CORPORATION OF NEW SOUTH WALES		ITHIN THE U.N.E.R. SHOWN ON MAP 1 TO THE NSW U.N.E.R. FOREST AGREEMENT GRANTED ON THE 5 MARCH 1999., COFFS HARBOUR, NSW 2450		Logging operations	Network of Features	417m	West

Delicensed Activities Data Source: Environment Protection Authority  
 © State of New South Wales through the Environment Protection Authority

### Former Licensed Activities under the POEO Act 1997, now revoked or surrendered

Former Licensed activities under the Protection of the Environment Operations Act 1997, now revoked or surrendered, within the dataset buffer:

Licence No	Organisation	Location	Status	Issued Date	Activity	Loc Conf	Distance	Direction
4653	LUHRMANN ENVIRONMENT MANAGEMENT PTY LTD	WATERWAYS THROUGHOUT NSW	Surrendered		Other Activities / Non Scheduled Activity - Application of Herbicides	Network of Features	0m	Onsite
4838	Robert Orchard	Various Waterways throughout New South Wales - SYDNEY NSW 2000	Surrendered		Other Activities / Non Scheduled Activity - Application of Herbicides	Network of Features	0m	Onsite
6630	SYDNEY WEED & PEST MANAGEMENT PTY LTD	WATERWAYS THROUGHOUT NSW - PROSPECT, NSW, 2148	Surrendered		Other Activities / Non Scheduled Activity - Application of Herbicides	Network of Features	0m	Onsite
13278	FULTON HOGAN CONSTRUCTION PTY LTD	Pacific Highway Sapphire to Woolgoolga Upgrade, Pacific Highway, SAPPHIRE	Surrendered	09/08/2010	Crushing, grinding or separating	Road Match	907m	South West
13278	FULTON HOGAN CONSTRUCTION PTY LTD	Pacific Highway Sapphire to Woolgoolga Upgrade, Pacific Highway, SAPPHIRE	Surrendered	09/08/2010	Land-based extractive activity	Road Match	907m	South West
13278	FULTON HOGAN CONSTRUCTION PTY LTD	Pacific Highway Sapphire to Woolgoolga Upgrade, Pacific Highway, SAPPHIRE	Surrendered	09/08/2010	Road construction	Road Match	907m	South West

Former Licensed Activities Data Source: Environment Protection Authority  
 © State of New South Wales through the Environment Protection Authority

# UPSS Sensitive Zones

Newmans Road & Barkhut Road, Woolgoolga, NSW 2456

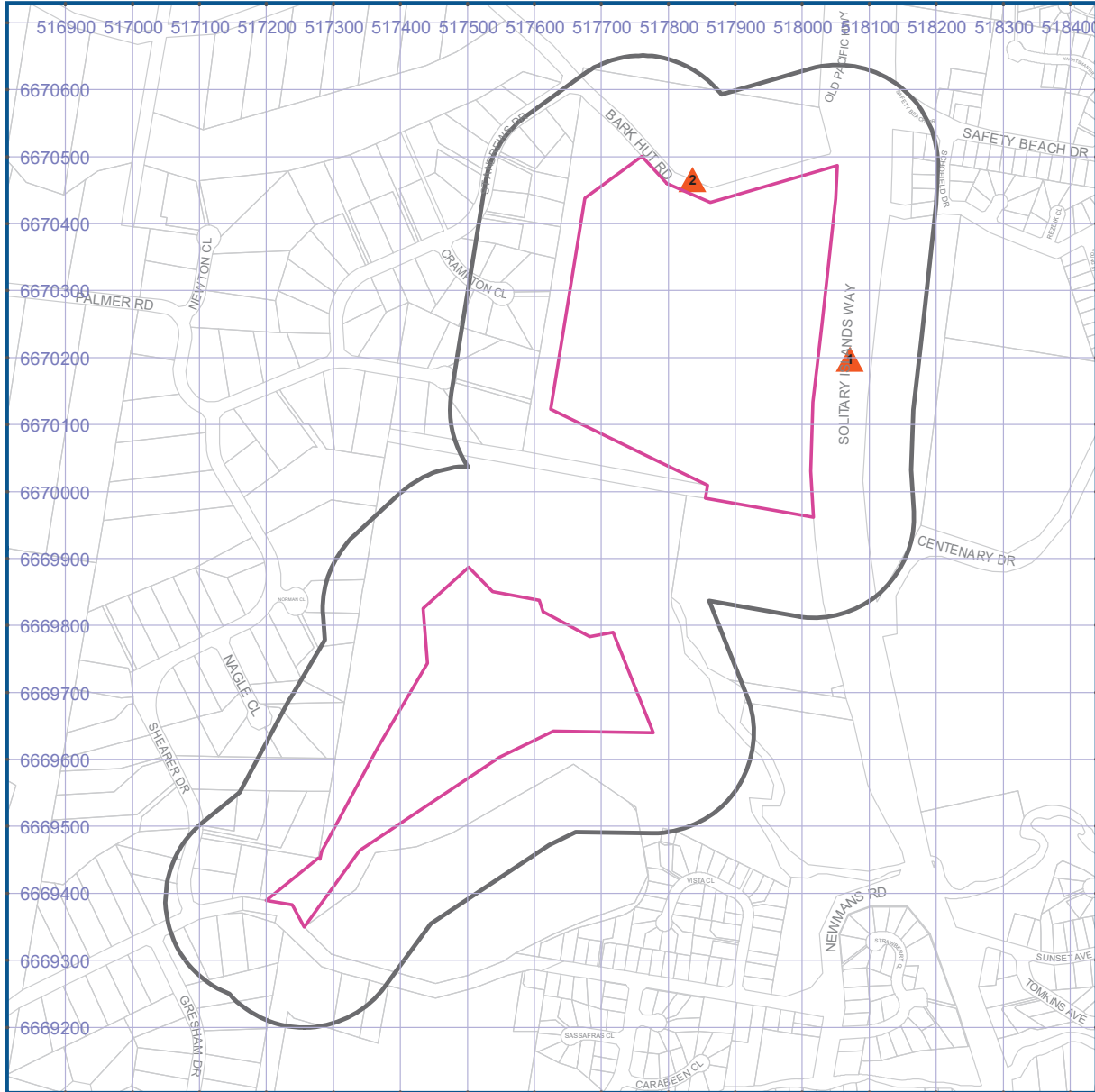


# Historical Business Directories

Newmans Road & Barkhut Road, Woolgoolga, NSW 2456



## 1982 Business Directory Records



	Site Boundary		Business directory records mapped to a specific premise	 N
	Buffer 150m		Business directory records mapped to a road intersection	
	Property Boundaries		Business directory records mapped to a road corridor	
			Business directory records mapped to a general area	

Projected Coordinate System: GDA94 MGA Zone 56

Data Sources: Universal Business Directories (UBD), derived data, licensed from Hardie Grant. Property Boundaries © NSW Department Finance, Services & Innovation 2019

# Historical Business Directories

Newmans Road & Barkhut Road, Woolgoolga, NSW 2456

## 1982 Business Directory Records Premise or Road Intersection Matches

Records from the 1982 UBD Business Directory, mapped to a premise or road intersection, within the dataset buffer:

Map Id	Business Activity	Premise	Ref No.	Location Confidence	Distance to Property Boundary or Road Intersection	Direction
	No records in buffer					

Business Directory Content Derived from Universal Business Directories (UBD) - Licensed from Hardie Grant

## 1982 Business Directory Records Road or Area Matches

Records from the 1982 UBD Business Directory, mapped to a road or an area, within the dataset buffer. Records are mapped to the road when a building number is not supplied, cannot be found, or the road has been renumbered since the directory was published:

Map Id	Business Activity	Premise	Ref No.	Location Confidence	Distance to Road Corridor or Area
1	MOTOR GARAGES /OR ENGINEERS &/OR SERVICE STATIONS.	BP Woolgoolga Roadhouse Pacific Highway, Woolgoolga.,	98392	Road Match	0m
	Not Listed	Colonial Surfside Caravan Park, Pacific Highway., Woolgoolga	98408	Road Match	0m
	Not Listed	Featherstone, W. D. & M.Carrier, Pacific Highway., Woolgoolga	98412	Road Match	0m
	Not Listed	Fountain's Motel, Pacific Highway., Woolgoolga	98415	Road Match	0m
	Not Listed	Hall, O. J. & Son, Tmbr. Mrcht., Old Pacific Highway., Woolgoolga	98423	Road Match	0m
	Not Listed	Parbury Henty & Co. Pty. Ltd., Tmbr.Mrcht., Pacific Highway., Woolgoolga	98436	Road Match	0m
	Not Listed	Pine Lodge Motel, Pacific Highway., Woolgoolga	98437	Road Match	0m
	Not Listed	Strawberry Patch, The, Grngrcr., Pacific Highway., Woolgoolga	98453	Road Match	0m
	Not Listed	Suncoast Auto Port.Pacific Highway, Mullaway. 248., Woolgoolga	98454	Road Match	0m
	Not Listed	Suncoast Motel, Pacific Highway, Mullaway. 248., Woolgoolga	98455	Road Match	0m
	Not Listed	Woolgoolga Motor Inn, Pacific Highway., Woolgoolga	98465	Road Match	0m
	Not Listed	Woolgoolga Road House, Pacific Highway., Woolgoolga	98469	Road Match	0m
2	Not Listed	Grafton Woolgoolga Bus Service, Bark Hut Rd., Woolgoolga	98418	Road Match	0m

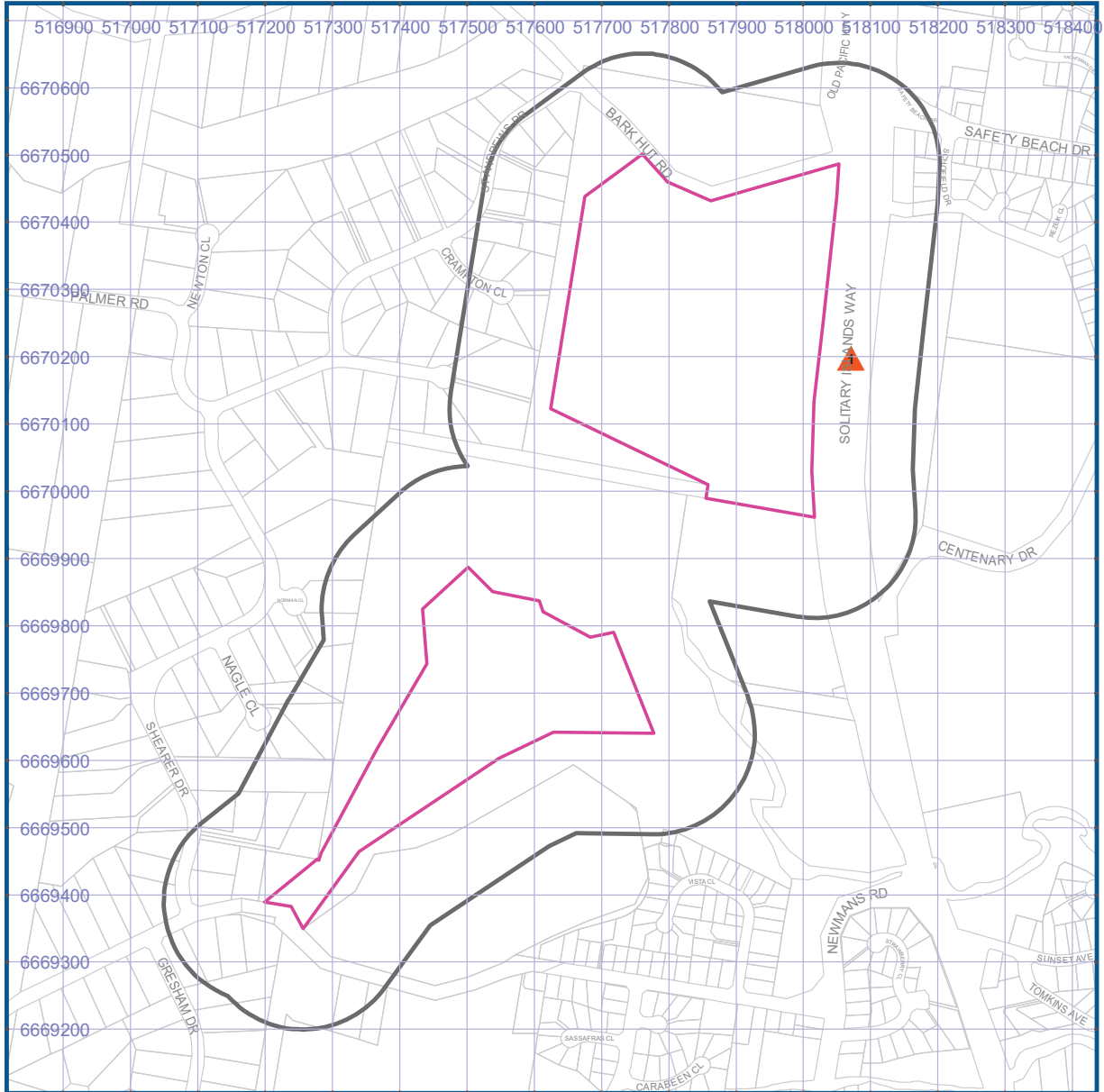
Business Directory Content Derived from Universal Business Directories (UBD) - Licensed from Hardie Grant

# Historical Business Directories

Newmans Road & Barkhut Road, Woolgoolga, NSW 2456



## 1970 Business Directory Records



	Site Boundary		Business directory records mapped to a specific premise	 N
	Buffer 150m		Business directory records mapped to a road intersection	
	Property Boundaries		Business directory records mapped to a road corridor	
			Business directory records mapped to a general area	

Projected Coordinate System: GDA94 MGA Zone 56

Data Sources: Universal Business Directories (UBD), derived data, licensed from Hardie Grant.  
Property Boundaries © NSW Department Finance, Services & Innovation 2019

# Historical Business Directories

Newmans Road & Barkhut Road, Woolgoolga, NSW 2456

## 1970 Business Directory Records Premise or Road Intersection Matches

Records from the 1970 UBD Business Directory, mapped to a premise or road intersection, within the dataset buffer:

Map Id	Business Activity	Premise	Ref No.	Location Confidence	Distance to Property Boundary or Road Intersection	Direction
	No records in buffer					

Business Directory Content Derived from Universal Business Directories (UBD) - Licensed from Hardie Grant

## 1970 Business Directory Records Road or Area Matches

Records from the 1970 UBD Business Directory, mapped to a road or an area, within the dataset buffer. Records are mapped to the road when a building number is not supplied, cannot be found, or the road has been renumbered since the directory was published:

Map Id	Business Activity	Premise	Ref No.	Location Confidence	Distance to Road Corridor or Area
1	MILK VENDORS	Bp Woolgoolga Service Station Pacific Highway, Woolgoolga	616442	Road Match	0m
	BOTTLED GAS-SUPPLIERS &/OR REFILLERS	BP Woolgoolga Service Station, Pacific Hghwy., Woolgoolga	616348	Road Match	0m
	CAFES, TEA ROOMS & COFFEE LOUNGES, ETC.	BP Woolgoolga Service Station, Pacific Hghwy., Woolgoolga	616360	Road Match	0m
	MILK BARS & CONFECTIONERY SHOPS	BP Woolgoolga Service Station, Pacific Hghwy., Woolgoolga	616433	Road Match	0m
	MOTOR GARAGES & ENGINEERS	BP Woolgoolga Service Station, Pacific Hghwy., Woolgoolga	616457	Road Match	0m
	TYRE DEALERS, RETREADERS & VULCANIZERS	BP Woolgoolga Service Station, Pacific Hghwy., Woolgoolga	616493	Road Match	0m
	CARRIERS & CARTAGE CONTRACTORS	Ellis, C. E., Pacific Hghwy., Woolgoolga	616371	Road Match	0m
	MOTELS	Fountains Motel, Pacific Hghwy. , Woolgoolga	616449	Road Match	0m
	CAFES, TEA ROOMS & COFFEE LOUNGES, ETC.	Golden Fleece Service Station & Restaurant, Pacific Hghwy., Woolgoolga	616361	Road Match	0m
	MOTOR SERVICE STATIONS-PETROL, OILS, ETC.	Golden Fleece Service Station & Restaurant, Pacific Hghwy., Woolgoolga	616464	Road Match	0m
	MILK BARS & CONFECTIONERY SHOPS	Golden Fleece Service Station, Pacific Hghwy., Woolgoolga	616436	Road Match	0m
	BOX & CASE MERCHANTS &/OR MANUFACTURERS	Hall, O. J. & Son, Pacific Hghwy., Woolgoolga	616352	Road Match	0m
	TIMBER MERCHANTS & SAWMILLERS	Hall, O. J. & Son, Pacific Hghwy., Woolgoolga	616488	Road Match	0m
	ASSOCIATIONS, SOCIETIES, CLUBS & SPORTING BODIES	Masonic Lodge, Pacific Hghwy., Woolgoolga	616331	Road Match	0m

Map Id	Business Activity	Premise	Ref No.	Location Confidence	Distance to Road Corridor or Area
1	TIMBER MERCHANTS & SAWMILLERS	Parbury Henty & Co. Pty. Ltd., Pacific Hghwy., Woolgoolga	616490	Road Match	0m
	AGRICULTURAL MACHINERY REPAIRERS	Ratcliffe, L., Pacific Hghwy., Woolgoolga	616322	Road Match	0m
	MOTOR GARAGES & ENGINEERS	Ratcliffe, L., Pacific Hghwy., Woolgoolga	616459	Road Match	0m
	WELDERS-ELECTRIC &/OR OXY	Ratcliffe, L., Pacific Hghwy., Woolgoolga	616498	Road Match	0m
	FRUITERERS & GREENGROCERS	Strawberry Patch (The), Pacific Hghwy., Woolgoolga	616396	Road Match	0m
	CAFES, TEA ROOMS & COFFEE LOUNGES, ETC.	Suncoast Auto Chef, Pacific Hghwy, Mullaway, Woolgoolga	616364	Road Match	0m
	LOCAL BODIES	Woolgoolga Bushfire Brigade, Pacific Hghwy., Woolgoolga	616429	Road Match	0m
	BOAT, LAUNCH & YACHT BUILDERS &/OR REPAIRERS	Woolgoolga Smash Repairs, Pacific Hghwy., Woolgoolga	616344	Road Match	0m
	MOTOR BODY BUILDERS & REPAIRERS	Woolgoolga Smash Repairs, Pacific Hghwy., Woolgoolga	616454	Road Match	0m
	MOTOR CAR &/OR TRUCK DEALERS-NEW &/OR USED	Woolgoolga Smash Repairs, Pacific Hghwy., Woolgoolga	616456	Road Match	0m
	MOTOR PAINTERS & PANEL BEATERS	Woolgoolga Smash Repairs, Pacific Hghwy., Woolgoolga	616461	Road Match	0m
	MOTOR RUSTPROOFING SPECIALISTS	Woolgoolga Smash Repairs, Pacific Hghwy., Woolgoolga	616462	Road Match	0m
	MOTOR TOWING SERVICES	Woolgoolga Smash Repairs, Pacific Hghwy., Woolgoolga	616467	Road Match	0m

Business Directory Content Derived from Universal Business Directories (UBD) - Licensed from Hardie Grant

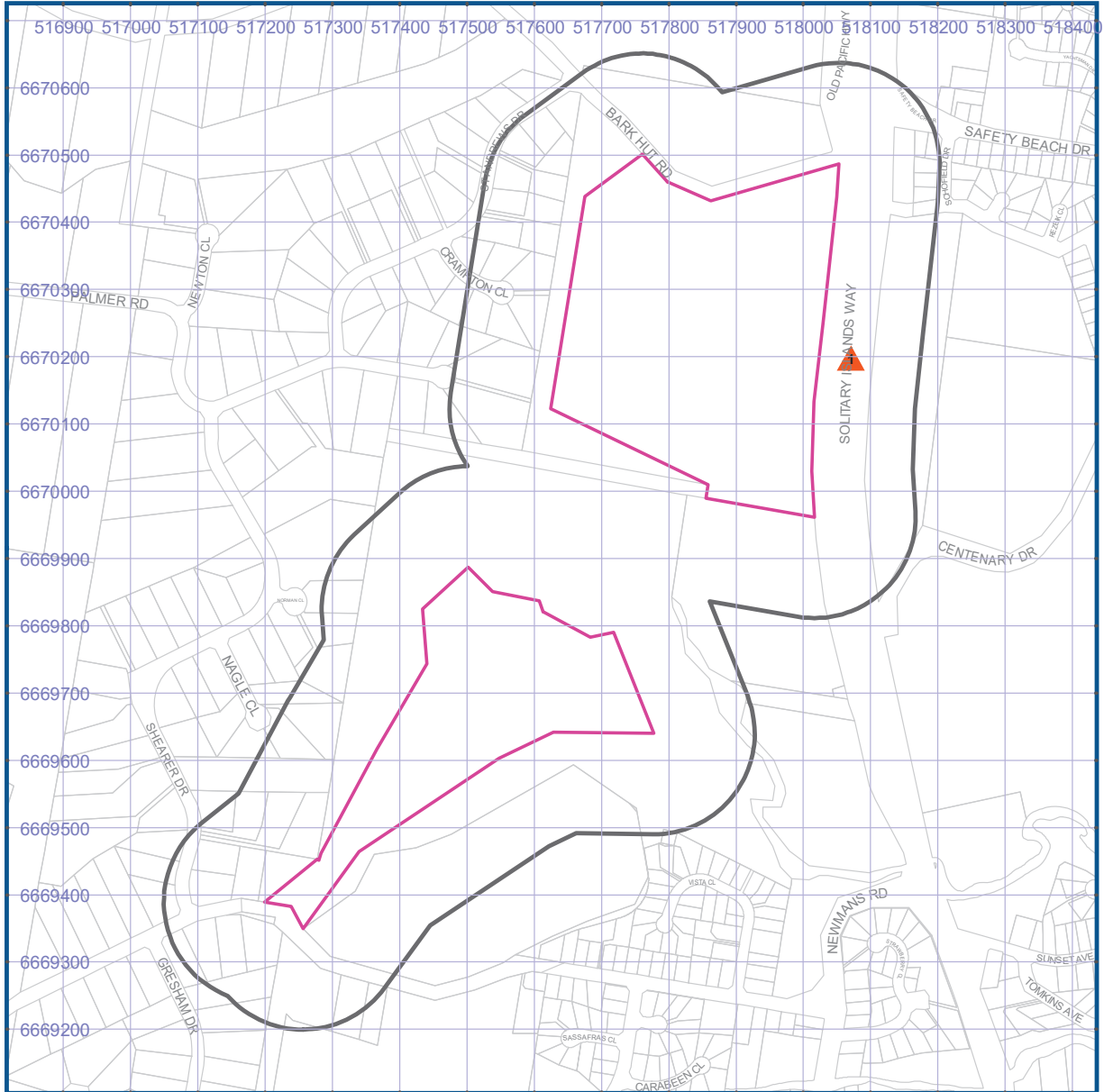


# Historical Business Directories

Newmans Road & Barkhut Road, Woolgoolga, NSW 2456



## 1961 Business Directory Records



 Site Boundary	 Business directory records mapped to a specific premise	 N
 Buffer 150m	 Business directory records mapped to a road intersection	
 Property Boundaries	 Business directory records mapped to a road corridor	
	 Business directory records mapped to a general area	

Projected Coordinate System: GDA94 MGA Zone 56

Data Sources: Universal Business Directories (UBD), derived data, licensed from Hardie Grant. Property Boundaries © NSW Department Finance, Services & Innovation 2019

## Historical Business Directories

Newmans Road & Barkhut Road, Woolgoolga, NSW 2456

### 1961 Business Directory Records Premise or Road Intersection Matches

Records from the 1961 UBD Business Directory, mapped to a premise or road intersection, within the dataset buffer:

Map Id	Business Activity	Premise	Ref No.	Location Confidence	Distance to Property Boundary or Road Intersection	Direction
	No records in buffer					

Business Directory Content Derived from Universal Business Directories (UBD) - Licensed from Hardie Grant

### 1961 Business Directory Records Road or Area Matches

Records from the 1961 UBD Business Directory, mapped to a road or an area, within the dataset buffer. Records are mapped to the road when a building number is not supplied, cannot be found, or the road has been renumbered since the directory was published:

Map Id	Business Activity	Premise	Ref No.	Location Confidence	Distance to Road Corridor or Area
1	MOTOR GARAGES & ENGINEERS	Clouten's, H., Golden Fleece Service Station, Pacific Highway., Woolgoolga	178249	Road Match	0m
	MINERAL SANDS-SEPARATION SPECIALISTS	Freeman, R. S., Pacific Highway, Woolgoolga	178237	Road Match	0m
	MOTOR GARAGES & ENGINEERS	Greentrees Motors, Pacific Highway., Woolgoolga	178250	Road Match	0m
	AGRICULTURAL MACHINERY DEALERS	Greentrees Motors, Pacific Highway., Woolgoolga	177971	Road Match	0m
	ENGINEERS-GENERAL, MFRG. & MECHANICAL	Greentrees Motors, Pacific Highway., Woolgoolga	178205	Road Match	0m
	INSURANCE AGENTS	Greentrees Motors, Pacific Highway., Woolgoolga	178228	Road Match	0m
	MOTOR BODY BUILDERS & REPAIRERS	Greentrees Motors, Pacific Highway., Woolgoolga	178246	Road Match	0m
	MOTOR CAR & TRUCK DEALERS-NEW & USED	Greentrees Motors, Pacific Highway., Woolgoolga	178248	Road Match	0m
	MOTOR PAINTERS & PANEL BEATERS	Greentrees Motors, Pacific Highway., Woolgoolga	178255	Road Match	0m
	MOTOR SERVICE STATIONS	Greentrees Motors, Pacific Highway., Woolgoolga	178258	Road Match	0m
	WELDERS-ELECTRIC &/OR OXY	Greentrees Motors, Pacific Highway., Woolgoolga	178279	Road Match	0m
	ELECTRICAL SUPPLIES & APPLIANCES RETAILERS	Greentree's Woolgooga Garage and Service Station, Pacific Highway., Woolgoolga	178000	Road Match	0m
	REFRIGERATOR DEALERS & SERVICEMEN.	Greentree's Woolgoolga Garage and Service Station, Pacific Highway., Woolgoolga	178268	Road Match	0m
	MEDICAL PRACTITIONERS	Macpherson, J. R., Pacific Highway., Woolgoolga	178231	Road Match	0m
	HAIRDRESSERS (GENT.'S) & TOBACCONISTS	McPherson, C., Pacific Highway., Woolgoolga	178216	Road Match	0m
	TIMBER MERCHANTS & SAWMILLERS	Moller, J. J. Pacific Highway., Woolgoolga	178278	Road Match	0m

Map Id	Business Activity	Premise	Ref No.	Location Confidence	Distance to Road Corridor or Area
1	MOTOR SERVICE STATIONS	Sun Coast Service Station, Pacific Highway., Mullaway, via Woolgoolga	178259	Road Match	0m
	MOTOR GARAGES & ENGINEERS	Sykes, A. F., Pacific Highway., Woolgoolga	178252	Road Match	0m
	BAKERS-BREAD	Towner, S. E., Pacific Highway., Woolgoolga	177975	Road Match	0m
	CAFES, TEA ROOMS & COFFEE LOUNGES, ETC.	Woolgoolga Service Station, Pacific Highway., Woolgoolga	177986	Road Match	0m
	MOTOR GARAGES & ENGINEERS	Woolgoolga Service Station, Pacific Highway., Woolgoolga	178253	Road Match	0m

Business Directory Content Derived from Universal Business Directories (UBD) - Licensed from Hardie Grant

## Historical Business Directories

Newmans Road & Barkhut Road, Woolgoolga, NSW 2456

### 1950 Business Directory Records Premise or Road Intersection Matches

Records from the 1950 UBD Business Directory, mapped to a premise or road intersection, within the dataset buffer:

Map Id	Business Activity	Premise	Ref No.	Location Confidence	Distance to Property Boundary or Road Intersection	Direction
	No records in buffer					

Business Directory Content Derived from Universal Business Directories (UBD) - Licensed from Hardie Grant

### 1950 Business Directory Records Road or Area Matches

Records from the 1950 UBD Business Directory, mapped to a road or an area, within the dataset buffer. Records are mapped to the road when a building number is not supplied, cannot be found, or the road has been renumbered since the directory was published:

Map Id	Business Activity	Premise	Ref No.	Location Confidence	Distance to Road Corridor or Area
	No records in buffer				

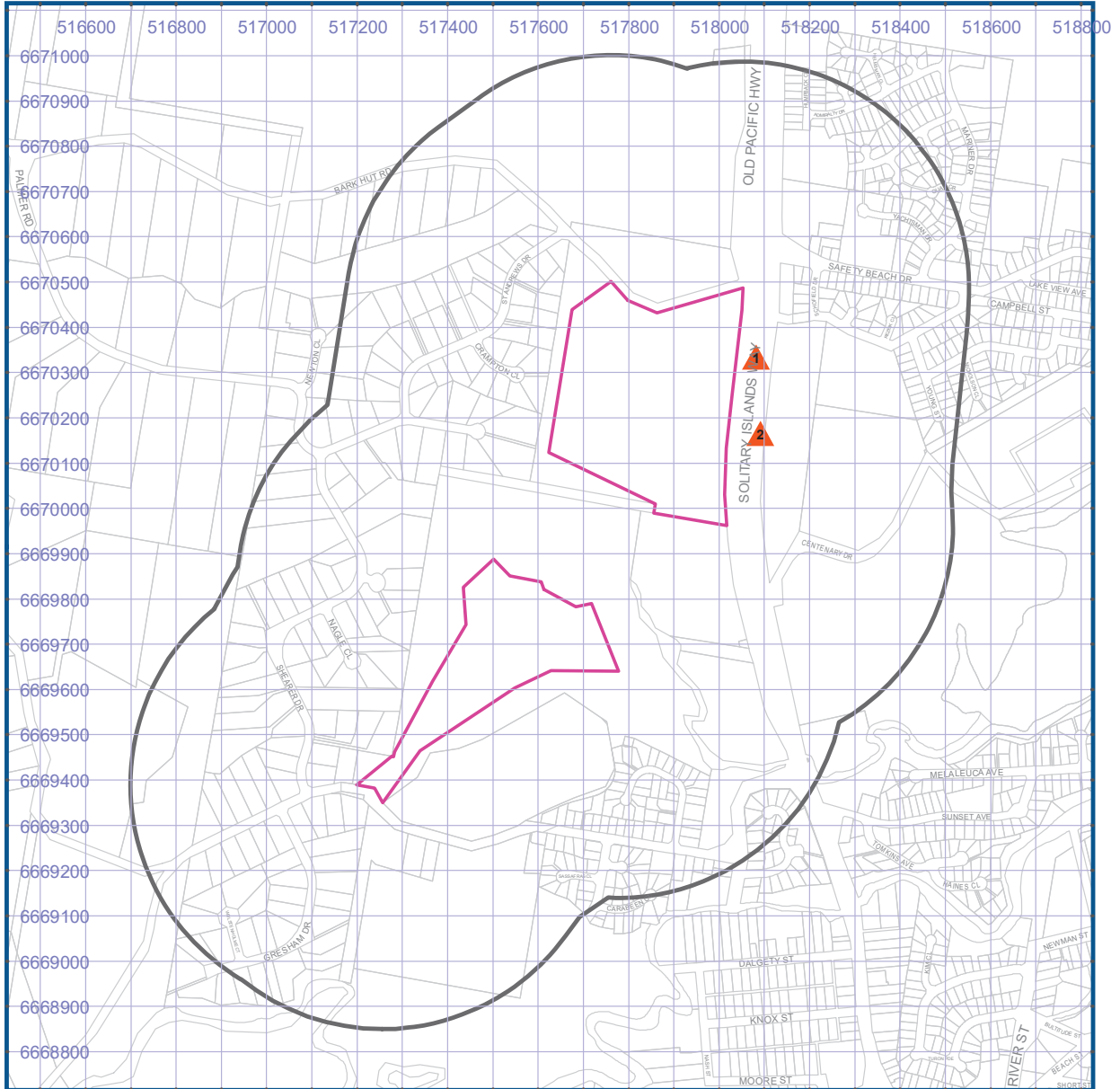
Business Directory Content Derived from Universal Business Directories (UBD) - Licensed from Hardie Grant

# Historical Business Directories

Newmans Road & Barkhut Road, Woolgoolga, NSW 2456



## Dry Cleaners, Motor Garages & Service Stations



	Site Boundary		Business directory records mapped to a specific premise	 N
	Buffer 500m		Business directory records mapped to a road intersection	
	Property Boundaries		Business directory records mapped to a road corridor	
			Business directory records mapped to a general area	

Projected Coordinate System: GDA94 MGA Zone 56

Data Sources: Universal Business Directories (UBD), derived data, licensed from Hardie Grant.  
Property Boundaries © NSW Department Finance, Services & Innovation 2019

## Historical Business Directories

Newmans Road & Barkhut Road, Woolgoolga, NSW 2456

### Dry Cleaners, Motor Garages & Service Stations Premise or Road Intersection Matches

Dry Cleaners, Motor Garages & Service Stations from UBD Business Directories, mapped to a premise or road intersection, within the dataset buffer.

Map Id	Business Activity	Premise	Ref No.	Year	Location Confidence	Distance to Property Boundary or Road Intersection	Direction
	No records in buffer						

Business Directory Content Derived from Universal Business Directories (UBD) - Licensed from Hardie Grant

### Dry Cleaners, Motor Garages & Service Stations Road or Area Matches

Dry Cleaners, Motor Garages & Service Stations from UBD Business Directories, mapped to a road or an area, within the dataset buffer. Records are mapped to the road when a building number is not supplied, cannot be found, or the road has been renumbered since the directory was published.

Map Id	Business Activity	Premise	Ref No.	Year	Location Confidence	Distance to Road Corridor or Area
1	MOTOR GARAGES /OR ENGINEERS &/OR SERVICE STATIONS.	BP Woolgoolga Roadhouse Pacific Highway, Woolgoolga.,	98392	1982	Road Match	0m
	MOTOR GARAGES & ENGINEERS	BP Woolgoolga Service Station, Pacific Hghwy., Woolgoolga	616457	1970	Road Match	0m
	MOTOR SERVICE STATIONS-PETROL, OILS, ETC.	Golden Fleece Service Station & Restaurant, Pacific Hghwy., Woolgoolga	616464	1970	Road Match	0m
	MOTOR GARAGES & ENGINEERS	Ratcliffe, L., Pacific Hghwy., Woolgoolga	616459	1970	Road Match	0m
	MOTOR GARAGES & ENGINEERS	Clouten's, H., Golden Fleece Service Station, Pacific Highway., Woolgoolga	178249	1961	Road Match	0m
	MOTOR GARAGES & ENGINEERS	Greentrees Motors, Pacific Highway., Woolgoolga	178250	1961	Road Match	0m
	MOTOR SERVICE STATIONS	Greentrees Motors, Pacific Highway., Woolgoolga	178258	1961	Road Match	0m
	MOTOR GARAGES & ENGINEERS	Sykes, A. F., Pacific Highway., Woolgoolga	178252	1961	Road Match	0m
	MOTOR GARAGES & ENGINEERS	Woolgoolga Service Station, Pacific Highway., Woolgoolga	178253	1961	Road Match	0m
2	MOTOR SERVICE STATIONS	Sun Coast Service Station, Pacific Highway., Mullaway, via Woolgoolga	178259	1961	Road Match	0m

Business Directory Content Derived from Universal Business Directories (UBD) - Licensed from Hardie Grant

## Cattle Dips

Newmans Road & Barkhut Road, Woolgoolga, NSW 2456

### Cattle Dips of the Northern Rivers Region

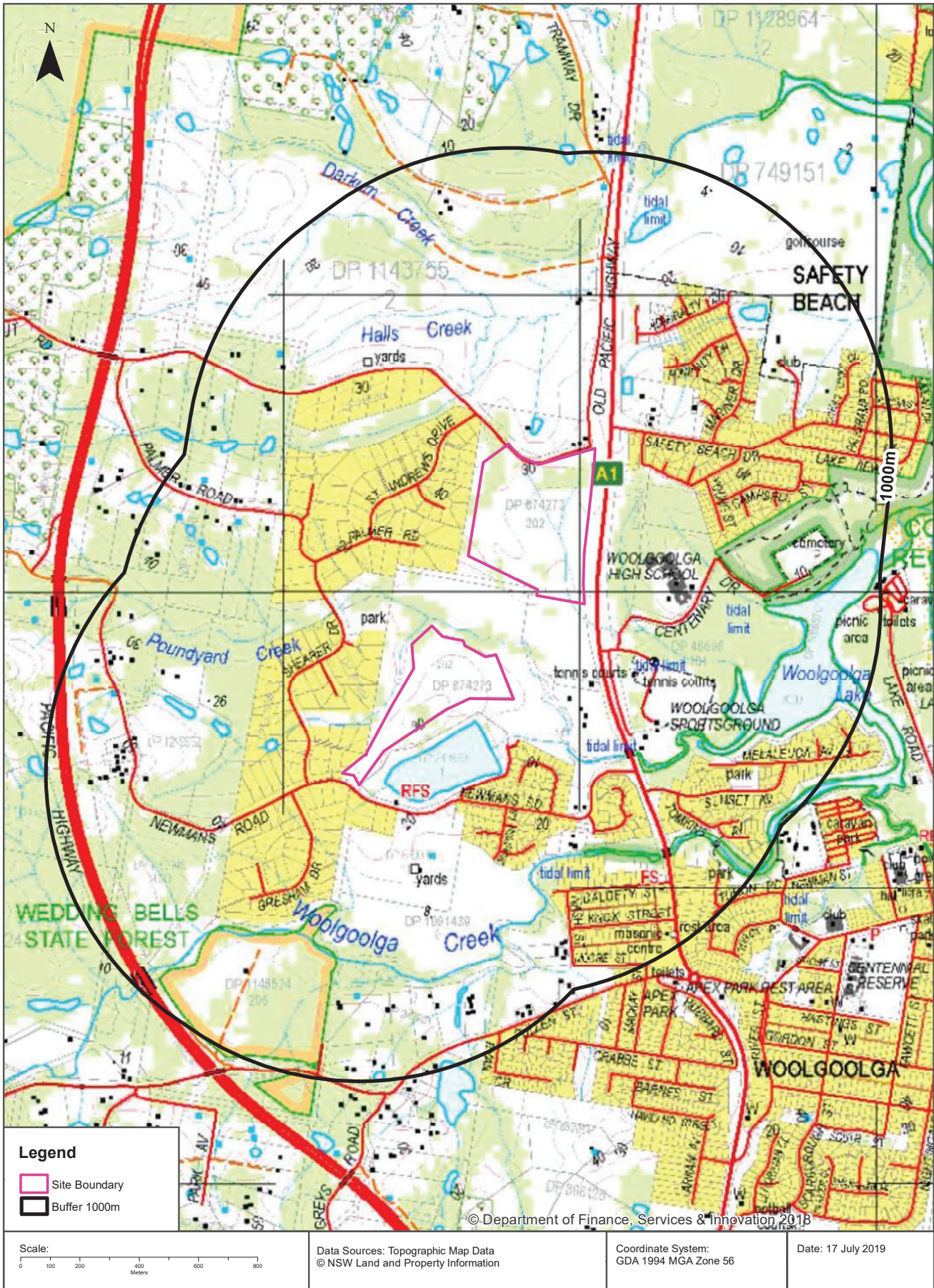
Cattle dip sites within the dataset buffer:

Dip Name	Road	Town	Dip Status	Licence / Lease Status	Licence / Lease Expiry Date	Distance (m)	Direction
N/A	No records in buffer						

Cattle dip site data provided by the NSW Department of Primary Industries.

# Topographic Map 2015

Newmans Road & Barkhut Road, Woolgoolga, NSW 2456





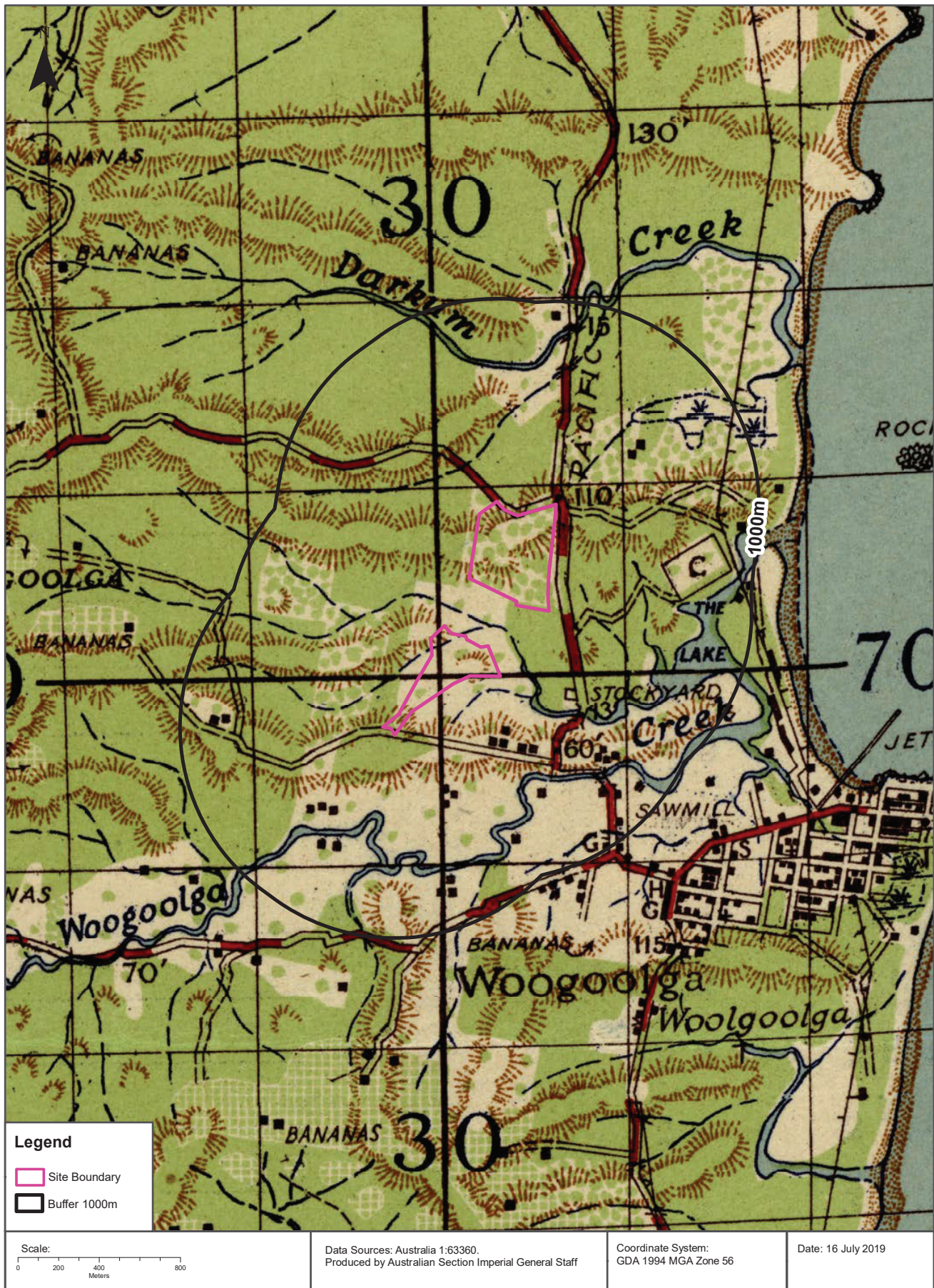
# Historical Map 1974

Newmans Road & Barkhut Road, Woolgoolga, NSW 2456



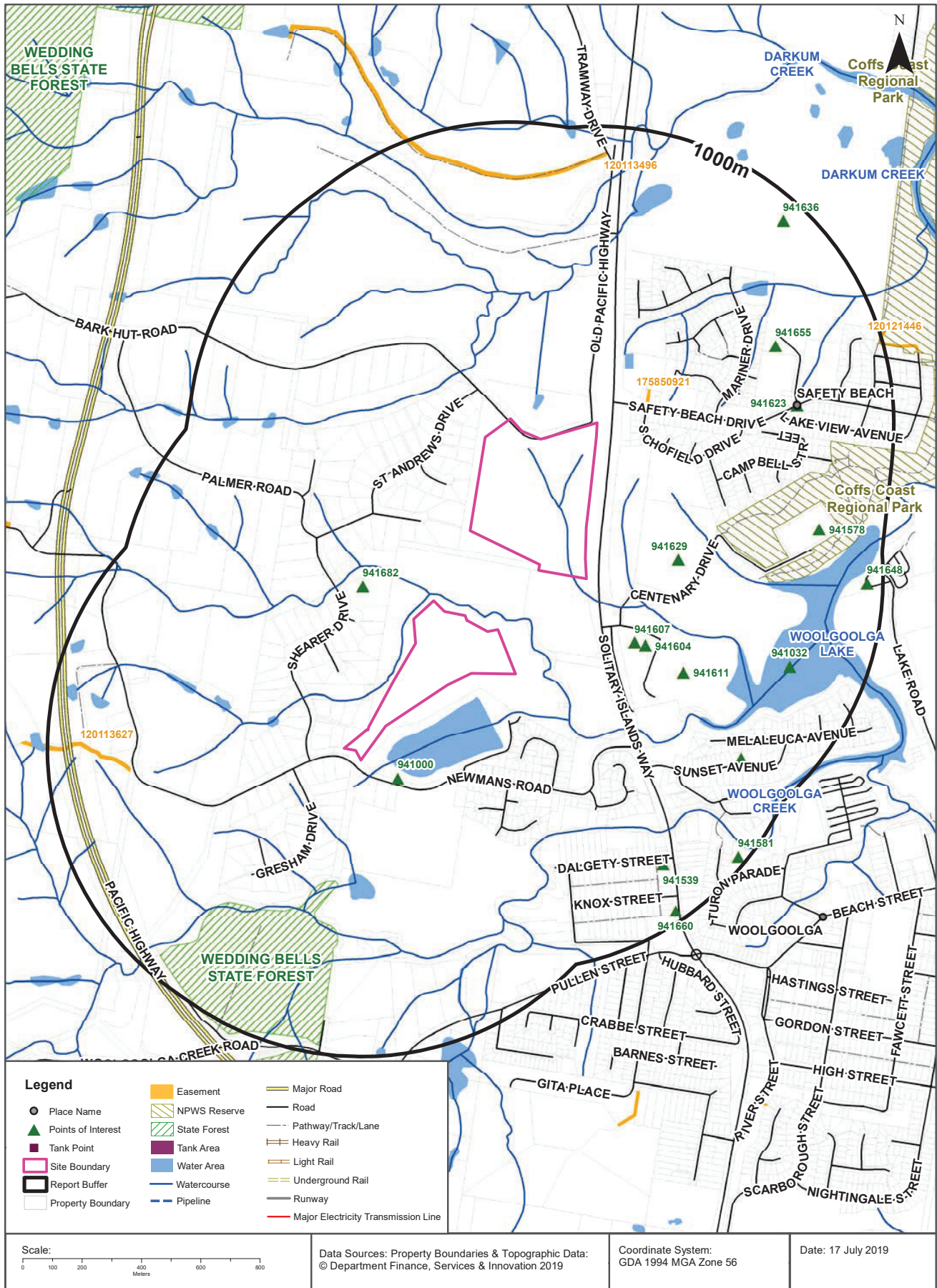
# Historical Map c.1941

Newmans Road & Barkhut Road, Woolgoolga, NSW 2456



# Topographic Features

Newmans Road & Barkhut Road, Woolgoolga, NSW 2456



## Topographic Features

Newmans Road & Barkhut Road, Woolgoolga, NSW 2456

### Points of Interest

What Points of Interest exist within the dataset buffer?

Map Id	Feature Type	Label	Distance	Direction
941000	Firestation - Bush	COUNTRY CLUB RFB	137m	South West
941682	Park	Park	204m	West
941607	Sports Court	TENNIS COURTS	270m	South East
941604	Sports Court	TENNIS COURTS	301m	South East
941629	High School	WOOLGOOLGA HIGH SCHOOL	313m	East
941611	Sports Field	WOOLGOOLGA SPORTSGROUND	455m	South East
941655	Club	WOOLGOOLGA DIGGERS GOLF CLUB	654m	North East
941623	Town	SAFETY BEACH	676m	North East
941032	Natural Waterbody	WOOLGOOLGA LAKE	746m	East
941578	Cemetery	WOOLGOOLGA CEMETERY	780m	East
941580	Park	Park	799m	South East
941539	Fire Station	WOOLGOOLGA FIRE STATION	813m	South East
941636	Golf Course	Golf Course	925m	North East
941648	Picnic Area	Picnic Area	945m	East
941660	Roadside Rest Area	REST AREA	965m	South East
941581	Park	Park	971m	South East

Topographic Data Source: © Land and Property Information (2015)

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## Topographic Features

Newmans Road & Barkhut Road, Woolgoolga, NSW 2456

### Tanks (Areas)

What are the Tank Areas located within the dataset buffer?

Note. The large majority of tank features provided by LPI are derived from aerial imagery & are therefore primarily above ground tanks.

Map Id	Tank Type	Status	Name	Feature Currency	Distance	Direction
	No records in buffer					

### Tanks (Points)

What are the Tank Points located within the dataset buffer?

Note. The large majority of tank features provided by LPI are derived from aerial imagery & are therefore primarily above ground tanks.

Map Id	Tank Type	Status	Name	Feature Currency	Distance	Direction
	No records in buffer					

Tanks Data Source: © Land and Property Information (2015)

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## Major Easements

What Major Easements exist within the dataset buffer?

Note. Easements provided by LPI are not at the detail of local governments. They are limited to major easements such as Right of Carriageway, Electrical Lines (66kVa etc.), Easement to drain water & Significant subterranean pipelines (gas, water etc.).

Map Id	Easement Class	Easement Type	Easement Width	Distance	Direction
175850921	Primary	Right of way	4 & 6 m	182m	North East
120113627	Primary	Undefined		724m	South West
120113496	Primary	Undefined		806m	North
120121446	Primary	Undefined		987m	North East

Easements Data Source: © Land and Property Information (2015)

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## Topographic Features

Newmans Road & Barkhut Road, Woolgoolga, NSW 2456

### State Forest

What State Forest exist within the dataset buffer?

State Forest Number	State Forest Name	Distance	Direction
360	WEDDING BELLS	417m	South West
360	WEDDING BELLS	985m	South

State Forest Data Source: © NSW Department of Finance, Services & Innovation (2018)  
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### National Parks and Wildlife Service Reserves

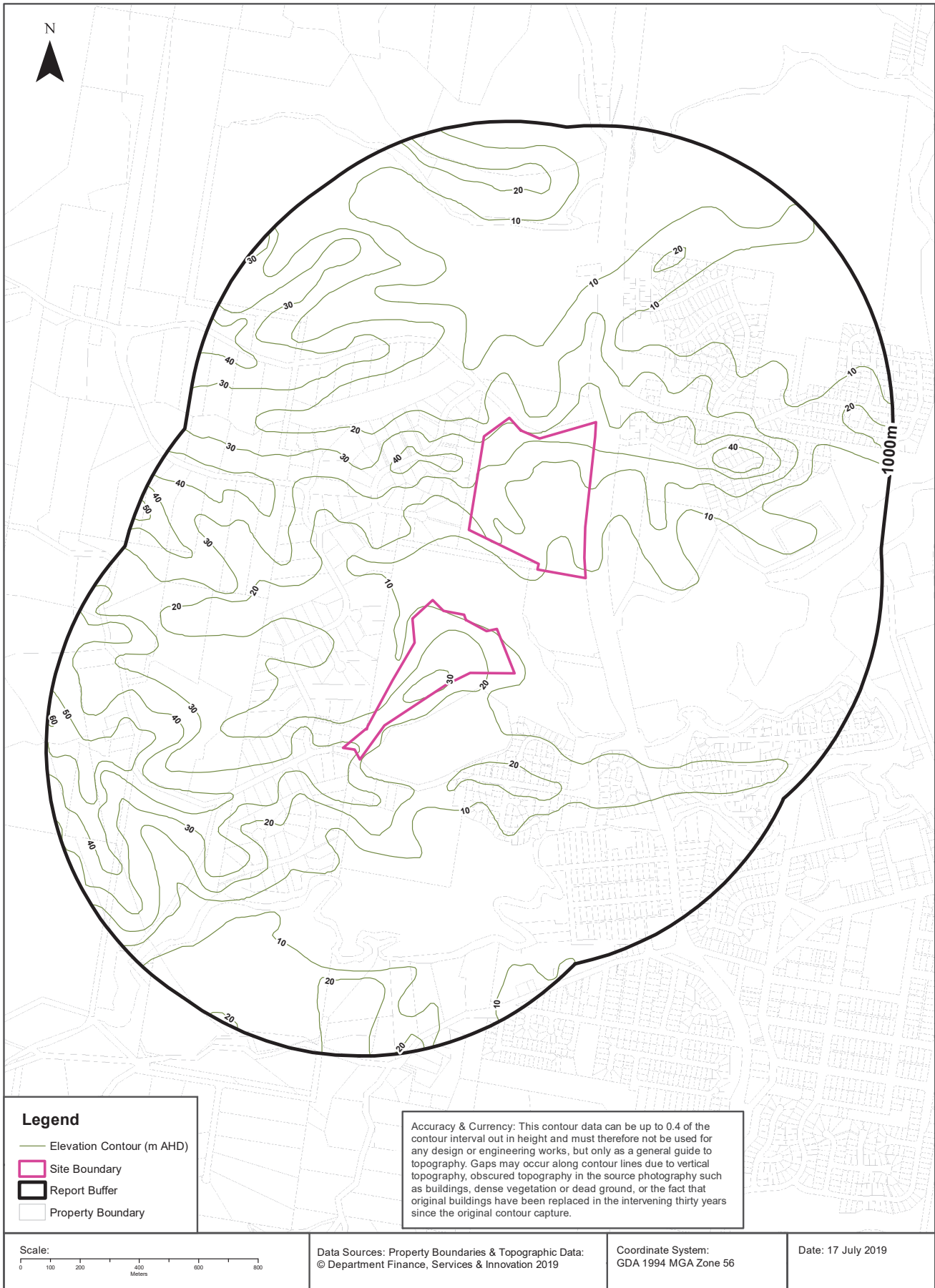
What NPWS Reserves exist within the dataset buffer?

Reserve Number	Reserve Type	Reserve Name	Gazetted Date	Distance	Direction
N1002	REGIONAL PARK	Coffs Coast Regional Park	03/10/2003	437m	South

NPWS Data Source: © NSW Department of Finance, Services & Innovation (2018)  
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# Elevation Contours (m AHD)

Newmans Road & Barkhut Road, Woolgoolga, NSW 2456



## Hydrogeology & Groundwater

Newmans Road & Barkhut Road, Woolgoolga, NSW 2456

### Hydrogeology

Description of aquifers on-site:

Description
Fractured or fissured, extensive aquifers of low to moderate productivity

Description of aquifers within the dataset buffer:

Description
Fractured or fissured, extensive aquifers of low to moderate productivity
Porous, extensive highly productive aquifers

Hydrogeology Map of Australia : Commonwealth of Australia (Geoscience Australia)  
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### Botany Groundwater Management Zones

Groundwater management zones relating to the Botany Sand Beds aquifer within the dataset buffer:

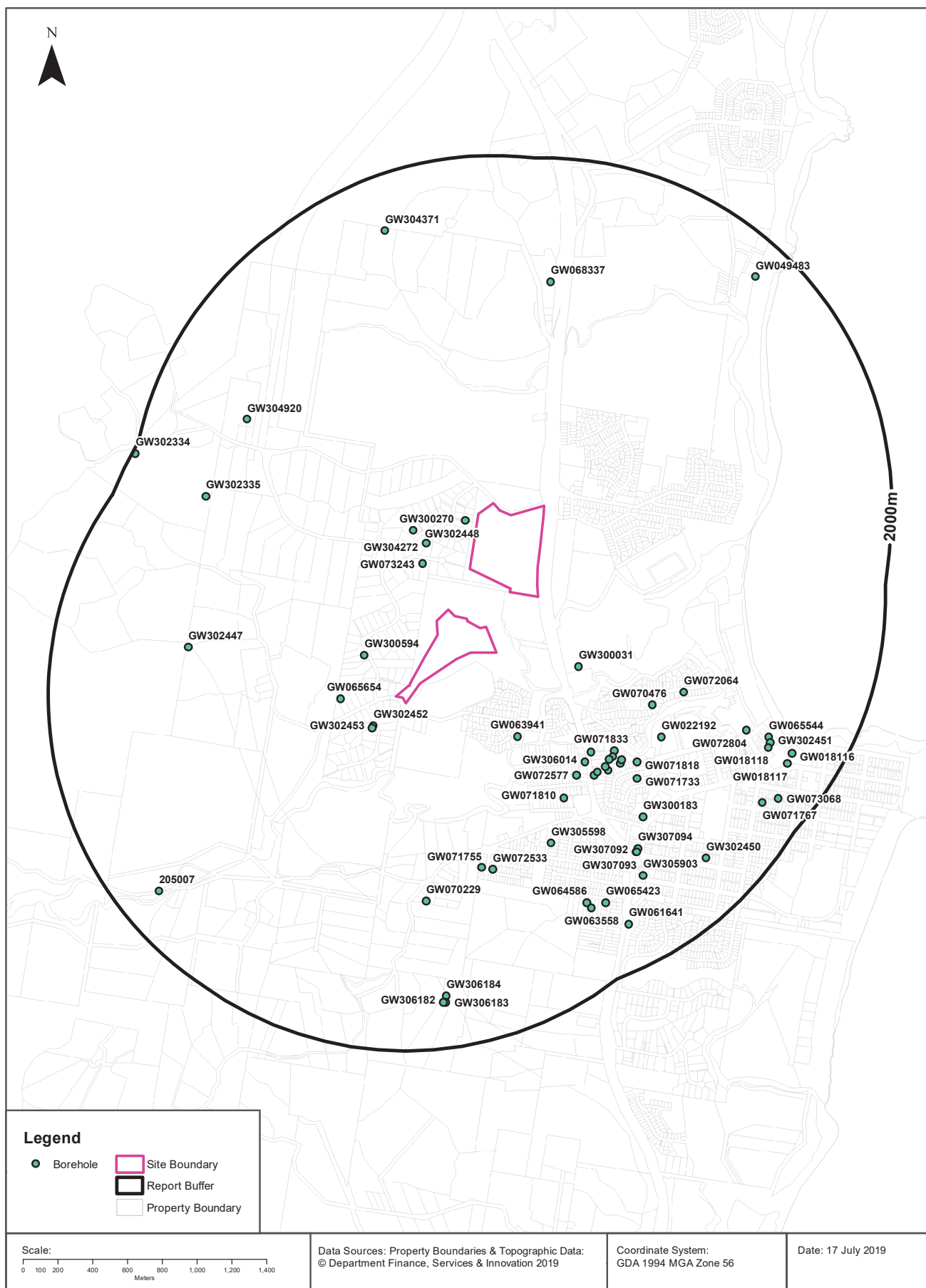
Management Zone No.	Restriction	Distance	Direction
N/A	No records in buffer		

Botany Groundwater Management Zones Data Source : NSW Department of Primary Industries



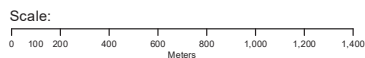
# Groundwater Boreholes

Newmans Road & Barkhut Road, Woolgoolga, NSW 2456



### Legend

- Borehole
- Site Boundary
- Report Buffer
- Property Boundary



Data Sources: Property Boundaries & Topographic Data:  
© Department Finance, Services & Innovation 2019

Coordinate System:  
GDA 1994 MGA Zone 56

Date: 17 July 2019

# Hydrogeology & Groundwater

Newmans Road & Barkhut Road, Woolgoolga, NSW 2456

## Groundwater Boreholes

Boreholes within the dataset buffer:

GW No.	Licence No	Work Type	Owner Type	Authorised Purpose	Intended Purpose	Name	Complete Date	Final Depth (m)	Drilled Depth (m)	Salinity (mg/L)	SWL (m)	Yield (L/s)	Elev (AHD)	Dist	Dir
GW302 448	30BL150 739	Bore		Domestic	Domestic		01/12/1992	42.00	42.00					67m	North
GW302 452	30BL176 330	Bore		Domestic	Domestic, Stock		09/11/1994	61.00	61.00					213m	South West
GW302 453	30BL176 330	Bore		Domestic	Domestic, Stock		09/11/1994	120.00	120.00					228m	South West
GW304 272	30BL181 072	Bore	Private	Domestic	Domestic		22/08/2003	48.00	48.00	660	18.00	0.6940		269m	North West
GW073 243	30BL176 329	Bore	Private	Domestic	Domestic, Stock		10/11/1994	53.00	53.00	Good	10.00	0.6100		270m	West
GW300 594	30BL176 649	Bore		Domestic	Domestic, Stock		13/01/1995	38.00	38.00	Good	4.00	0.610		295m	South West
GW065 654	30BL138 480	Bore	Private	Domestic	Domestic		16/11/1988	40.00	40.00		9.00	0.100		316m	South West
GW300 270	30BL145 157	Bore	Private	Domestic	Domestic		21/06/1992	73.00	73.00	Good	9.00	0.189		355m	North West
GW300 031	30BL176 683, 30CA30 2702	Bore		Irrigation, Recreation (groundwater )	Domestic, Stock		07/11/1994	31.00	31.00	Good	4.00	2.590		465m	South East
GW063 941	30BL135 175	Bore	Private	Domestic	Domestic		01/09/1986	31.00	31.00					498m	South
GW306 015	30BL184 223	Well	Private	Monitoring Bore	Monitoring Bore		21/06/2006	7.00	7.00		1.00			792m	South East
GW306 014	30BL184 222	Well	Private	Monitoring Bore	Monitoring Bore		21/06/2006	8.00	8.00		5.70			811m	South East
GW072 577	30BL154 217	Bore	Private	Domestic	Domestic		20/02/1994	30.00	30.00	Good		1.020		843m	South East
GW071 833	30BL154 144	Bore	Private	Domestic	Domestic		15/02/1994	12.00	12.00	Good	6.00	0.610		883m	South East
GW071 423	30BL153 516	Bore	Private	Domestic	Domestic		06/12/1993	21.00	21.00	Good	5.00	0.730		896m	South East
GW305 289	30BL182 625	Bore		Domestic	Domestic		25/06/2004	18.00	18.00		3.00	0.180		901m	South East
GW306 013	30BL183 493	Well	Private	Monitoring Bore	Monitoring Bore		21/06/2006	8.00	8.00		3.40			902m	South East
GW305 388	30BL178 719	Bore	Private	Monitoring Bore	Monitoring Bore		12/10/2005							903m	South East
GW070 476	30BL150 984	Bore	Private	Domestic	Domestic		01/11/1992	54.00	54.00	1800	20.00	2.2730	10.00	906m	South East
GW070 088	30BL150 439, 30BL178 713	Bore	Private	Domestic, Irrigation, Stock	Domestic		12/08/1992	24.00	24.00	Good	9.00	1.263		908m	South East
GW071 810	30BL154 031, 30WA30 2699	Bore	Private	Domestic	Domestic		11/02/1994	15.00	15.00	Good	5.00	0.630		923m	South
GW303 191	30BL179 900	Bore	Private	Domestic	Domestic									936m	South East
GW071 773	30BL153 805	Bore	Private	Domestic	Domestic		14/02/1994	13.00	13.00	Good	6.00	0.610		950m	South East
GW071 424	30BL153 517	Bore	Private	Domestic	Domestic		03/12/1993	15.00	15.00	Good	3.00	1.230		958m	South East
GW072 064	30BL176 565	Bore	Private	Domestic	Domestic		18/12/1994	24.00	24.00	Good	9.00	1.265		1004m	South East

GW No.	Licence No	Work Type	Owner Type	Authorised Purpose	Intended Purpose	Name	Complete Date	Final Depth (m)	Drilled Depth (m)	Salinity (mg/L)	SWL (m)	Yield (L/s)	Elev (AHD)	Dist	Dir
GW071 818	30BL154 087	Bore	Private	Domestic	Domestic		14/02/1994	13.00	13.00	Good	6.00	0.610		1026m	South East
GW071 755	30BL153 541	Bore	Private	Domestic	Domestic		02/12/1993	15.00	15.00	Good	4.00	1.600		1044m	South
GW022 192		Well	Private		Irrigation		01/07/1964	3.70	3.70	0-500 ppm				1069m	South East
GW072 533	30BL153 593	Bore	Private	Domestic	Domestic, Stock		06/12/1993	17.00	17.00		1.00	0.610		1081m	South
GW071 733	30BL153 165	Bore		Domestic	Domestic, Stock		22/02/1994	50.00	51.00	Good		0.480		1087m	South East
GW305 598	30BL181 603	Bore	Private	Domestic	Domestic		23/01/2006	24.00	24.00	610	5.70	1.516		1140m	South
GW070 229	30BL150 738	Bore	Private	Domestic	Domestic		05/10/1992	24.00	24.00	Good	6.00	0.578		1145m	South
GW302 447	30BL153 189	Bore		Domestic	Domestic		12/10/1993	72.00	72.00					1224m	West
GW300 183	30BL144 174	Bore	Private	Domestic	Domestic		25/08/1992	36.00	36.00	Good	9.00	0.758		1268m	South East
GW068 337	30BL140 234	Bore	Private	Domestic, Stock			08/11/1989	70.00	70.00		21.00	0.400		1287m	North
GW307 094		Bore	Private		Monitoring Bore	Beard - MW3	10/06/2011	5.60	5.60		2.50			1391m	South East
GW307 092		Bore	Private		Monitoring Bore	Beard - MW1	08/06/2011	6.50	6.50		2.60			1402m	South East
GW307 093		Bore	Private		Monitoring Bore	Beard - MW2	08/06/2011	5.50	5.50		2.40			1402m	South East
GW072 804	30BL155 387	Bore		Domestic	Domestic, Stock		31/08/1994	15.00	15.00	Good	3.00	0.490		1426m	South East
GW304 920	30BL180 125	Bore		Monitoring Bore	Monitoring Bore		17/06/2002	25.30	25.30					1437m	North West
GW302 335	30BL143 111	Bore		Domestic, Irrigation	Stock		26/06/1992	42.00	42.00	Good	12.00	0.505		1505m	West
GW064 586	30BL137 236	Bore	Private	Domestic, Stock	Domestic, Stock		01/01/1988	33.00	33.00	Good				1530m	South
GW305 903	30BL178 898	Bore	Private	Domestic	Domestic		01/02/2000	100.00			70.00	5.000		1537m	South East
GW065 544	30BL142 970, 30BL143 271	Bore	Private	Irrigation, Test Bore	Irrigation		29/04/1991	31.00	31.00		6.90	1.000		1555m	South East
GW063 558	30BL137 224	Bore	Private	Domestic, Stock	Domestic, Stock		01/01/1988	27.00	27.00	Good				1568m	South
GW065 423	30BL138 164	Bore	Private	Domestic	Domestic		05/08/1988	21.00	21.00	Good		2.000		1570m	South
GW302 451	30BL176 659	Bore		Domestic	Domestic, Stock		17/01/1995	18.00	18.00	Salty				1578m	South East
GW018 118	30BL011 858	Well	Local Govt	Waste Disposal	Not Known		01/12/1955	6.10	6.10					1587m	South East
GW304 371	30BL182 082	Bore	Private	Domestic	Domestic		09/09/2003	42.00	42.00	980	10.00	1.515		1685m	North
GW302 450	30BL176 044	Bore		Domestic	Domestic		15/09/1994	33.00	33.00	Good	9.00	0.100		1691m	South East
GW306 184	30BL183 892	Bore	Private	Domestic	Domestic		13/11/2005	54.00	54.00	520	18.00	0.316		1702m	South
GW018 116	30BL011 859	Well	Local Govt	Waste Disposal	Not Known		01/01/1961	7.30						1717m	South East
GW018 117	30BL011 860	Well	Local Govt	Waste Disposal	Not Known		01/01/1961	5.50	5.50					1728m	South East
GW306 182	30BL183 892	Bore	Private	Domestic	Domestic		11/11/2005	61.00	61.00					1737m	South
GW306 183	30BL183 892	Bore	Private	Domestic	Domestic		12/11/2005	85.00	85.00					1737m	South
GW061 641	30BL133 934	Bore	Private	Domestic	Domestic		01/10/1985	18.00	18.00					1738m	South East
GW071 767	30BL153 737	Bore	Private	Domestic	Domestic		20/02/1994	20.00	27.00					1755m	South East
205007					UNK								26.53	1764m	South West

GW No.	Licence No	Work Type	Owner Type	Authorised Purpose	Intended Purpose	Name	Complete Date	Final Depth (m)	Drilled Depth (m)	Salinity (mg/L)	SWL (m)	Yield (L/s)	Elev (AHD)	Dist	Dir
GW049483	30BL109572	Bore open thru rock	Private	Domestic, Stock	Domestic, Stock		01/07/1979	12.20	12.20					1792m	North East
GW073068	30BL176056	Bore	Private	Domestic	Domestic		20/09/1994	14.30	14.30	S.Salty	1.50	1.500		1807m	South East
GW302334	30BL143111	Bore		Domestic, Irrigation	Stock		25/06/1992	61.00	61.00	Good	27.00	0.126		1980m	West

Borehole Data Source : NSW Department of Primary Industries - Office of Water / Water Administration Ministerial Corporation for all bores prefixed with GW. All other bores © Commonwealth of Australia (Bureau of Meteorology) 2015. Creative Commons 3.0 © Commonwealth of Australia <http://creativecommons.org/licenses/by/3.0/au/deed.en>

# Hydrogeology & Groundwater

Newmans Road & Barkhut Road, Woolgoolga, NSW 2456

## Driller's Logs

Drill log data relevant to the boreholes within the dataset buffer:

Groundwater No	Drillers Log	Distance	Direction
GW302448	0.00m-12.00m BROWN GREY WACKY SHALE 12.00m-42.00m GREY WACKY	67m	North
GW302452	0.00m-2.00m CLAY 2.00m-4.00m SHALE 4.00m-61.00m MOSTLY BASALT	213m	South West
GW302453	0.00m-3.00m CLAY 3.00m-6.00m SHALE 6.00m-120.00m MOSTLY BASALT	228m	South West
GW304272	0.00m-0.30m BROWN TOPSOIL 0.30m-1.00m BROWN CLAY 1.00m-6.00m BROWN SHALE 6.00m-9.00m BROWN SHALE 9.00m-24.00m BASALT 24.00m-29.00m CRACKY BASALT (W/B) 29.00m-42.00m BASALT 42.00m-46.00m CRACKY BASALT (W/B) 46.00m-48.00m BASALT	269m	North West
GW073243	0.00m-12.00m Shale 12.00m-16.00m Broken Shale 16.00m-48.00m Mostly Basalt 48.00m-51.00m Broken Shale 51.00m-53.00m Basalt	270m	West
GW300594	0.00m-3.00m CLAY 3.00m-8.00m SHALE 8.00m-34.00m BASALT 34.00m-35.00m BROKEN BASALT 35.00m-38.00m BASALT	295m	South West
GW065654	0.00m-2.00m TOPSOIL 2.00m-5.00m HARD RED CLAY 5.00m-9.00m SHALE 9.00m-20.00m BASALT 20.00m-24.00m SHATTERED BASALT 24.00m-28.00m BASALT 28.00m-29.00m SHALE BLACK 29.00m-40.00m BASALT	316m	South West
GW300270	0.00m-6.00m BROWN SHALE 6.00m-31.00m BASALT 31.00m-36.00m CRACKY BASALT 36.00m-73.00m BASALT	355m	North West
GW300031	0.00m-6.00m Clay 6.00m-12.00m Shale Soft 12.00m-21.00m Shale Hard 21.00m-24.00m Shale - broken 24.00m-31.00m Basalt	465m	South East
GW063941	0.00m-2.00m Soil 2.00m-22.00m Shale Water Supply 22.00m-24.00m Coal Shale 24.00m-29.00m Basalt Broken Rock Water Supply 29.00m-31.00m Basalt	498m	South
GW072577	0.00m-13.00m Colored Clays 13.00m-18.00m Grey Shale 18.00m-30.00m Black Shale	843m	South East
GW071833	0.00m-6.00m Dry Clay 6.00m-8.00m Wet Black Clay	883m	South East

Groundwater No	Drillers Log	Distance	Direction
GW071423	14.00m-18.00m Gravel/clay 18.00m-20.00m Soft Shale	896m	South East
GW305289	0.00m-1.20m soil 1.20m-9.00m clay 9.00m-18.00m dec shale	901m	South East
GW070476	0.00m-0.30m Topsoil 0.30m-4.00m Clay - brown 4.00m-12.00m Shale - brown 12.00m-30.00m Shale - black 30.00m-49.00m Slate - black hard 49.00m-54.00m Slate - black & reef quartz 54.00m-54.00m Slate - black	906m	South East
GW070088	0.00m-1.00m SHALE FILL 1.00m-1.30m BLACK SOIL 1.30m-5.00m BROWN CLAY 5.00m-6.00m GREY CLAY 6.00m-12.00m SOFT BROWN SHALE 12.00m-12.30m CEMENTED WASHED GRAVELS 12.30m-18.00m SOFT BROWN SHALE 18.00m-20.00m HARD " " 20.00m-24.00m FRACTURED HARD BROWN SHALE	908m	South East
GW071810	0.00m-12.00m Colored Clays 12.00m-15.00m Broken Shale	923m	South
GW071773	0.00m-8.00m Dry Clay 8.00m-10.00m Swamp Black Clay 10.00m-13.00m Gravel	950m	South East
GW071424	8.00m-15.00m Gravel & Some Shale	958m	South East
GW072064	0.00m-0.30m Black Topsoil 0.30m-0.90m Clay Fill 0.90m-6.00m Brown Clay 6.00m-12.00m Grey Clay 12.00m-19.00m Grey Shale 19.00m-24.00m Broken Grey Shale	1004m	South East
GW071818	0.00m-6.00m Dry Clay 6.00m-10.00m Wet Black Clay	1026m	South East
GW071755	2.00m-10.00m Soft Shale 12.00m-15.00m Broken Rock/basalt	1044m	South
GW022192	0.00m-0.61m Loam 0.61m-3.66m Gravel Creek Water Supply	1069m	South East
GW072533	0.00m-2.00m Clay 2.00m-8.00m Shale 8.00m-14.00m Basalt 14.00m-16.00m Broken Rock/basalt 16.00m-17.00m Basalt	1081m	South
GW071733	0.00m-6.00m CLAY 6.00m-12.00m BLACK SHALE 12.00m-16.00m GRAVEL/SHALE 16.00m-51.00m BASSALT	1087m	South East
GW305598	0.00m-0.60m shale, fill 0.60m-2.00m clay, brown pug 2.00m-4.50m shale, brown 4.50m-5.00m basalt 5.00m-19.00m basalt 19.00m-23.00m basalt. broken 23.00m-24.00m basalt	1140m	South
GW070229	0.00m-0.30m Black Topsoil 0.30m-6.00m Red Clay 19.00m-24.00m Cracky Basalt	1145m	South
GW302447	0.00m-8.00m SOFT BROWN SHALE 8.00m-36.00m BASALT 36.00m-72.00m BLACK PRESSURED SHALE	1224m	West
GW300183	0.00m-0.30m BLACK TOPSOIL 0.30m-2.30m BROWN CLAY 2.30m-18.00m BROWN SHALE 18.00m-30.00m BROWN SHALE 30.00m-31.00m BASALT 31.00m-36.00m BROKEN BASALT	1268m	South East

Groundwater No	Drillers Log	Distance	Direction
GW068337	0.00m-2.00m Fill 2.00m-13.00m Clay 13.00m-21.00m Soft Shale 21.00m-24.00m Hard Shale 24.00m-58.00m Basalt 58.00m-61.00m Quartz Seams 61.00m-70.00m Basalt	1287m	North
GW307094	0.00m-0.20m Fill; Concrete 0.20m-1.50m Silty Clay; high plasticity, red-brown, stiff, slightly moist 1.50m-2.50m Clay, Gravelly; medium plasticity, light brown, hard, slightly moist 2.50m-3.00m Silty Clay; high plasticity, light brown, hard, slightly moist 3.00m-5.60m Clay, Gravelly; medium plasticity, light brown, hard, slightly moist, wet @ 5.5m	1391m	South East
GW307092	0.00m-0.20m Fill; concrete 0.20m-0.50m Fill; Gravelly Sandy Clay; low plasticity, green grey, firm, slightly moist 0.50m-6.50m Silty Clay; high plasticity, orange-grey with mottled red, very stiff, slightly moist, frequent localised gravels/subang	1402m	South East
GW307093	0.00m-0.20m Fill; Concrete 0.20m-5.50m Silty Clay; high plasticity, red-brown, very stiff, slightly moist, gravels frequent from 1.3m, light brown, subangular	1402m	South East
GW072804	0.00m-6.00m Sand 6.00m-13.00m Sand & Loam 13.00m-15.00m Shale interbedded with gravel	1426m	South East
GW304920	0.00m-1.80m clay silty, high plasticity 1.80m-7.80m lithic sandstone 7.80m-22.00m Argillite	1437m	North West
GW302335	0.00m-6.00m BROWN SHALE 6.00m-34.00m BASALT 34.00m-39.00m CRACKY BASALT 39.00m-42.00m BASALT	1505m	West
GW064586	0.00m-8.00m Shale Soft 8.00m-12.00m Shale 12.00m-22.00m Basalt 22.00m-24.00m Basalt Broken Water Supply 24.00m-28.00m Basalt 28.00m-31.00m Basalt Broken Water Supply 31.00m-33.00m Basalt	1530m	South
GW065544	0.00m-2.00m WHITE SAND 2.00m-4.00m BROWN SAND 4.00m-6.00m COFFEE ROCK 6.00m-8.00m BROWN SAND 8.00m-11.00m CLAY 11.00m-12.00m BLUE SHALE 12.00m-16.00m FRACTURED SHALE 16.00m-18.00m BROWN SHALE 18.00m-31.00m BASALT	1555m	South East
GW063558	0.00m-4.00m Clay 4.00m-10.00m Shale 10.00m-19.00m Basalt 19.00m-20.00m Basalt Broken Water Supply 20.00m-22.00m Basalt 22.00m-25.00m Basalt Broken Water Supply, Rock Broken 25.00m-27.00m Basalt	1568m	South
GW065423	0.00m-2.00m CLAY 2.00m-8.00m SOFT SHALE 8.00m-16.00m MID HARD SHALE 16.00m-21.00m BROKEN ROCK	1570m	South
GW302451	0.00m-2.00m TOP SAND 2.00m-8.00m COFFEE ROCK 8.00m-12.00m SAND 12.00m-13.00m BLACK CLAY 13.00m-15.00m GRAVEL & SALT WATER 15.00m-18.00m SHALE	1578m	South East
GW018118	0.00m-2.44m Sand 2.44m-3.05m Sandstone Black 3.05m-6.10m Sand	1587m	South East

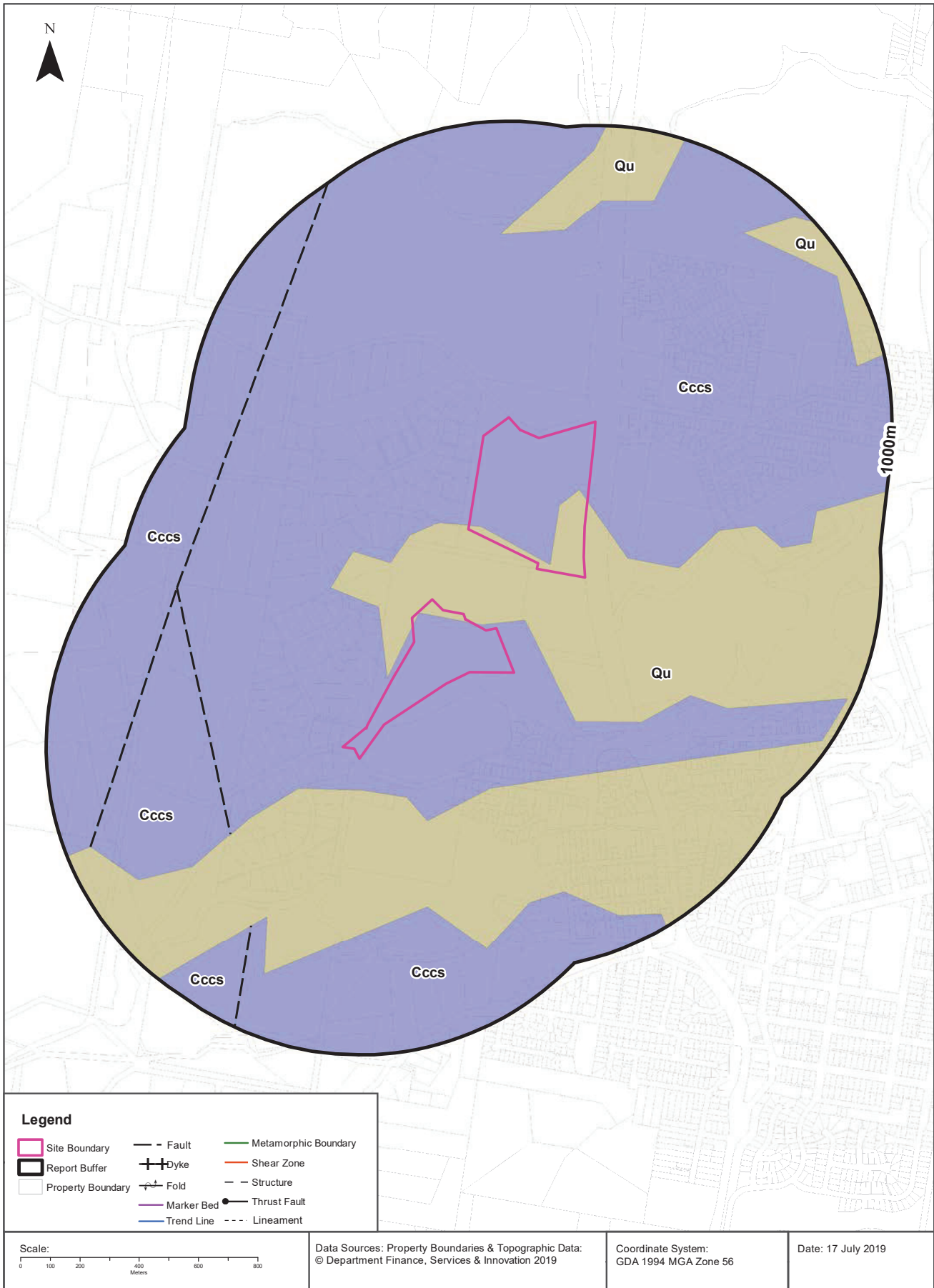
Groundwater No	Drillers Log	Distance	Direction
GW304371	0.00m-3.00m CLAY/SHALE FILL 3.00m-12.00m BROWN SHALE HARD 18.00m-24.00m GREY SHALE VOLCANIC HARD 24.00m-29.00m CRACKY BASALT BLACK (W/B) 29.00m-36.00m BLACK BASALT 36.00m-40.00m BROKEN BLACK BASALT (W/B) 40.00m-42.00m BASALT BLACK	1685m	North
GW302450	0.00m-1.00m TOPSOIL 1.00m-10.00m BROWN CLAY 10.00m-12.00m FRACTURED META SEDIMENT 12.00m-33.00m SHALE	1691m	South East
GW306184	0.00m-12.00m Shale, yellow 12.00m-16.00m Shale, brown 16.00m-31.00m Basalt 31.00m-36.00m Basalt, cracky, water bearing 36.00m-54.00m Slate, black, hard, leafy	1702m	South
GW018117	0.00m-2.44m Sand 2.44m-3.05m Sandstone Black 3.05m-5.49m Sand Water Supply	1728m	South East
GW306182	0.00m-0.30m Topsoil 0.30m-2.00m Clay, yellow 2.00m-40.00m Basalt 40.00m-61.00m Slate, black, hard, leafy	1737m	South
GW306183	0.00m-0.50m Topsoil, grey 0.50m-3.00m Clay, yellow 3.00m-5.00m Shale, yellow 5.00m-42.00m Basalt 42.00m-85.00m Slate, black, hard, leafy	1737m	South
GW061641	0.00m-2.00m Fill 2.00m-5.00m Clay 5.00m-8.00m Shale 5.00m-8.00m Gravel Soil Hard 8.00m-16.00m Shale White Hard Soft Water Supply 16.00m-18.00m Shale	1738m	South East
GW071767	0.00m-6.00m Coloured Clay 6.00m-9.00m Weathered Shale 9.00m-27.00m Black Shale	1755m	South East
GW049483	0.00m-2.00m Soil Black 2.00m-6.70m Clay 6.70m-12.20m Quartzite Soak	1792m	North East
GW073068	0.00m-5.10m Sand 5.10m-7.60m Clay Blue 7.60m-10.60m Fractured Metasediment 10.60m-14.30m Shale And Quartz Large	1807m	South East
GW302334	0.00m-3.00m BROWN SHALE 3.00m-31.00m BASALT 31.00m-36.00m CRACKY BASALT 36.00m-61.00m BASALT	1980m	West

Drill Log Data Source: NSW Department of Primary Industries - Office of Water / Water Administration Ministerial Corp  
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# Geology 1:250,000

Newmans Road & Barkhut Road, Woolgoolga, NSW 2456



# Geology

Newmans Road & Barkhut Road, Woolgoolga, NSW 2456

## Geological Units

What are the Geological Units onsite?

Symbol	Description	Unit Name	Group	Sub Group	Age	Dom Lith	Map Sheet	Dataset
Cccs	Lithofeldspathic wacke, minor siltstone, siliceous siltstone, mudstone, metabasalt, chert & jasper, rare calcareous siltstone & felsic volcanics 'Coffs Harbour Association' (Cc)	Coramba beds			Palaeozoic			1:250,000
Qu	Undifferentiated Quaternary sediments including: alluvial mud, silt, sand, gravel deposits, & swamp deposits; coastal sand beaches & dunes; estuarine deposits				Cainozoic			1:250,000

What are the Geological Units within the dataset buffer?

Symbol	Description	Unit Name	Group	Sub Group	Age	Dom Lith	Map Sheet	Dataset
Cccs	Lithofeldspathic wacke, minor siltstone, siliceous siltstone, mudstone, metabasalt, chert & jasper, rare calcareous siltstone & felsic volcanics 'Coffs Harbour Association' (Cc)	Coramba beds			Palaeozoic			1:250,000
Qu	Undifferentiated Quaternary sediments including: alluvial mud, silt, sand, gravel deposits, & swamp deposits; coastal sand beaches & dunes; estuarine deposits				Cainozoic			1:250,000

## Geological Structures

What are the Geological Structures onsite?

Feature	Name	Description	Map Sheet	Dataset
No features				1:250,000

What are the Geological Structures within the dataset buffer?

Feature	Name	Description	Map Sheet	Dataset
Fault		Fault, Inferred	UNE	1:250,000
Fault		Fault, Inferred	UNE	1:250,000
Fault		Fault, Inferred	UNE	1:250,000
Fault		Fault, Inferred	UNE	1:250,000

Geological Data Source : NSW Department of Industry, Resources & Energy  
 © State of New South Wales through the NSW Department of Industry, Resources & Energy

# Naturally Occurring Asbestos Potential

Newmans Road & Barkhut Road, Woolgoolga, NSW 2456

## Naturally Occurring Asbestos Potential

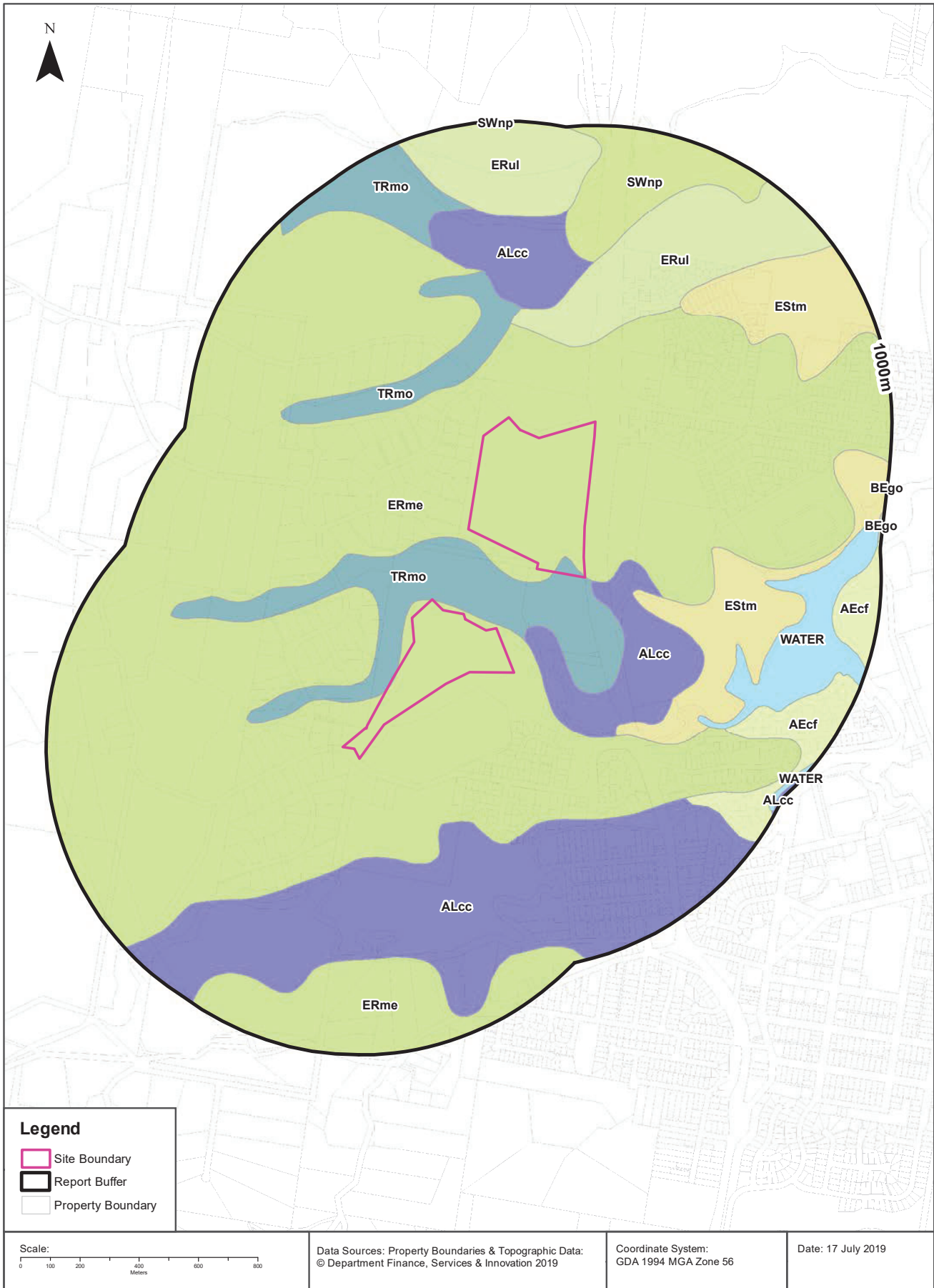
Naturally Occurring Asbestos Potential within the dataset buffer:

Potential	Sym	Strat Name	Group	Formation	Scale	Min Age	Max Age	Rock Type	Dom Lith	Description	Dist	Dir
No records in buffer												

Mining Subsidence District Data Source: © State of New South Wales through NSW Department of Industry, Resources & Energy

# Soil Landscapes

Newmans Road & Barkhut Road, Woolgoolga, NSW 2456



## Soils

Newmans Road & Barkhut Road, Woolgoolga, NSW 2456

## Soil Landscapes

What are the onsite Soil Landscapes?

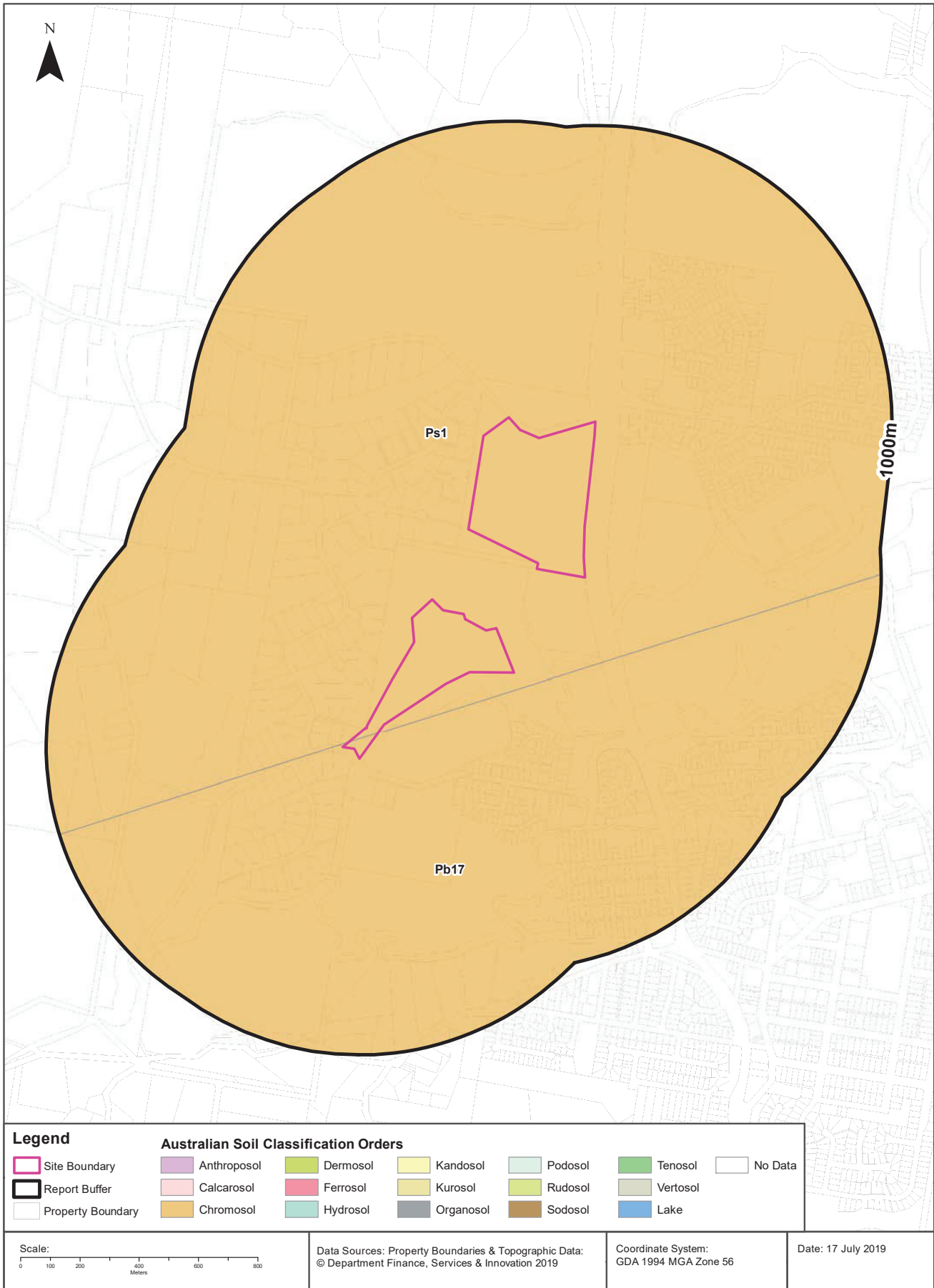
Soil Code	Name	Group	Process	Map Sheet	Scale
ERme	MEGAN		EROSIONAL	Coffs Harbour	1:100,000
TRmo	MOONEE		TRANSFERRAL	Coffs Harbour	1:100,000

What are the Soil Landscapes within the dataset buffer?

Soil Code	Name	Group	Process	Map Sheet	Scale
AEcf	COFFS HARBOUR		AEOLIAN	Coffs Harbour	1:100,000
ALcc	COFFS CREEK		ALLUVIAL	Coffs Harbour	1:100,000
BEgo	GOOLAWAH		BEACH	Coffs Harbour	1:100,000
ERme	MEGAN		EROSIONAL	Coffs Harbour	1:100,000
ERul	ULONG		EROSIONAL	Coffs Harbour	1:100,000
EStm	TOORMINA		ESTUARINE	Coffs Harbour	1:100,000
SWnp	NEWPORTS CREEK		SWAMP	Coffs Harbour	1:100,000
TRmo	MOONEE		TRANSFERRAL	Coffs Harbour	1:100,000
WATER	WATER		WATER	Coffs Harbour	1:100,000

Soils Landscapes Data Source : NSW Office of Environment and Heritage

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## Soils

Newmans Road & Barkhut Road, Woolgoolga, NSW 2456

### Atlas of Australian Soils

Soil mapping units and Australian Soil Classification orders within the dataset buffer:

Map Unit Code	Soil Order	Map Unit Description	Distance
Pb17	Chromosol	Hilly areas alternating with small wet flats: hilly areas of hard acidic red soils (Dr2.21 and Dr2.11) possibly with other (D) soils, and small wet flats of such soils as (Gn3.94). Soils data are limited.	0m
Ps1	Chromosol	Steep hills and ridges: chief soils are friable acidic red soils (Dr4.21) and hard acidic red soils (Dr2.21) probably with other (D) soils, not described at present. Associated are (Um4.2) (Gn2.24), and (Gn2.44) soils on the steeper and relatively drier slopes; and (Gn4.14) and (Gn3.14) soils on the relatively more humid slopes.	0m

Atlas of Australian Soils Data Source: CSIRO

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# Acid Sulfate Soils

Newmans Road & Barkhut Road, Woolgoolga, NSW 2456





## Acid Sulfate Soils

Newmans Road & Barkhut Road, Woolgoolga, NSW 2456

### Environmental Planning Instrument - Acid Sulfate Soils

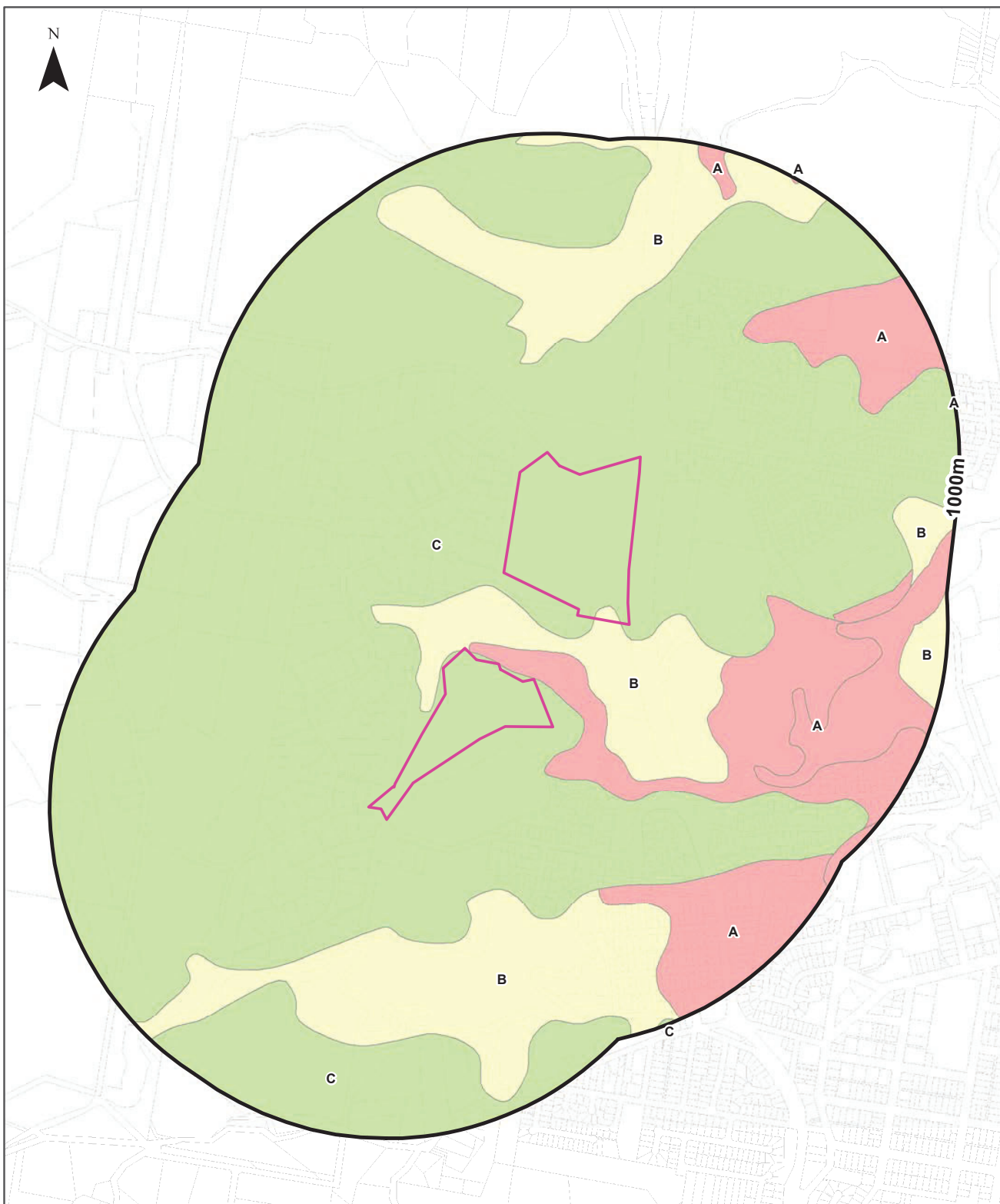
What is the on-site Acid Sulfate Soil Plan Class that presents the largest environmental risk?

Soil Class	Description	EPI Name
4	Works more than 2 metres below natural ground surface present an environmental risk; Works by which the watertable is likely to be lowered more than 2 metres below natural ground surface, present an environmental risk	Coffs Harbour Local Environmental Plan 2013

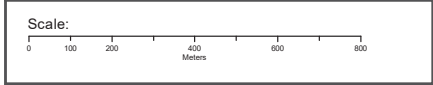
If the on-site Soil Class is 5, what other soil classes exist within 500m?

Soil Class	Description	EPI Name	Distance	Direction
N/A				

Acid Sulfate Data Source Accessed 23/10/2018: NSW Crown Copyright - Planning and Environment  
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<b>Legend</b>			
Site Boundary	<b>Probability of occurrence of Acid Sulfate Soils</b>		
Report Buffer	A. High (>70%)	C. Extremely Low (1-5%)	No Data
Property Boundary	B. Low (6-70%)	D. No Chance (0%)	



Data Sources: Property Boundaries & Topographic Data:  
© Department Finance, Services & Innovation 2019

Coordinate System:  
GDA 1994 MGA Zone 56

Date: 17 July 2019

## Acid Sulfate Soils

Newmans Road & Barkhut Road, Woolgoolga, NSW 2456

### Atlas of Australian Acid Sulfate Soils

Atlas of Australian Acid Sulfate Soil categories within the dataset buffer:

Class	Description	Distance
B	Low Probability of occurrence. 6-70% chance of occurrence.	0m
C	Extremely low probability of occurrence. 1-5% chance of occurrence with occurrences in small localised areas.	0m
A	High Probability of occurrence. >70% chance of occurrence.	1m

Atlas of Australian Acid Sulfate Soils Data Source: CSIRO

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## Dryland Salinity

Newmans Road & Barkhut Road, Woolgoolga, NSW 2456

### Dryland Salinity - National Assessment

Is there Dryland Salinity - National Assessment data onsite?

No

Is there Dryland Salinity - National Assessment data within the dataset buffer?

No

What Dryland Salinity assessments are given?

Assessment 2000	Assessment 2020	Assessment 2050	Distance	Direction
N/A	N/A	N/A	N/A	N/A

Dryland Salinity Data Source : National Land and Water Resources Audit

The Commonwealth and all suppliers of source data used to derive the maps of "Australia, Forecast Areas Containing Land of High Hazard or Risk of Dryland Salinity from 2000 to 2050" do not warrant the accuracy or completeness of information in this product. Any person using or relying upon such information does so on the basis that the Commonwealth and data suppliers shall bear no responsibility or liability whatsoever for any errors, faults, defects or omissions in the information. Any persons using this information do so at their own risk.

In many cases where a high risk is indicated, less than 100% of the area will have a high hazard or risk.

### Dryland Salinity Potential of Western Sydney

Dryland Salinity Potential of Western Sydney within the dataset buffer?

Feature Id	Classification	Description	Distance	Direction
N/A	Outside Data Coverage			

Dryland Salinity Potential of Western Sydney Data Source : NSW Office of Environment and Heritage

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## Mining Subsidence Districts

Newmans Road & Barkhut Road, Woolgoolga, NSW 2456

## Mining Subsidence Districts

Mining Subsidence Districts within the dataset buffer:

District	Distance	Direction
There are no Mining Subsidence Districts within the report buffer		

Mining Subsidence District Data Source: © Land and Property Information (2016)  
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# State Environmental Planning Policy

Newmans Road & Barkhut Road, Woolgoolga, NSW 2456

## State Significant Precincts

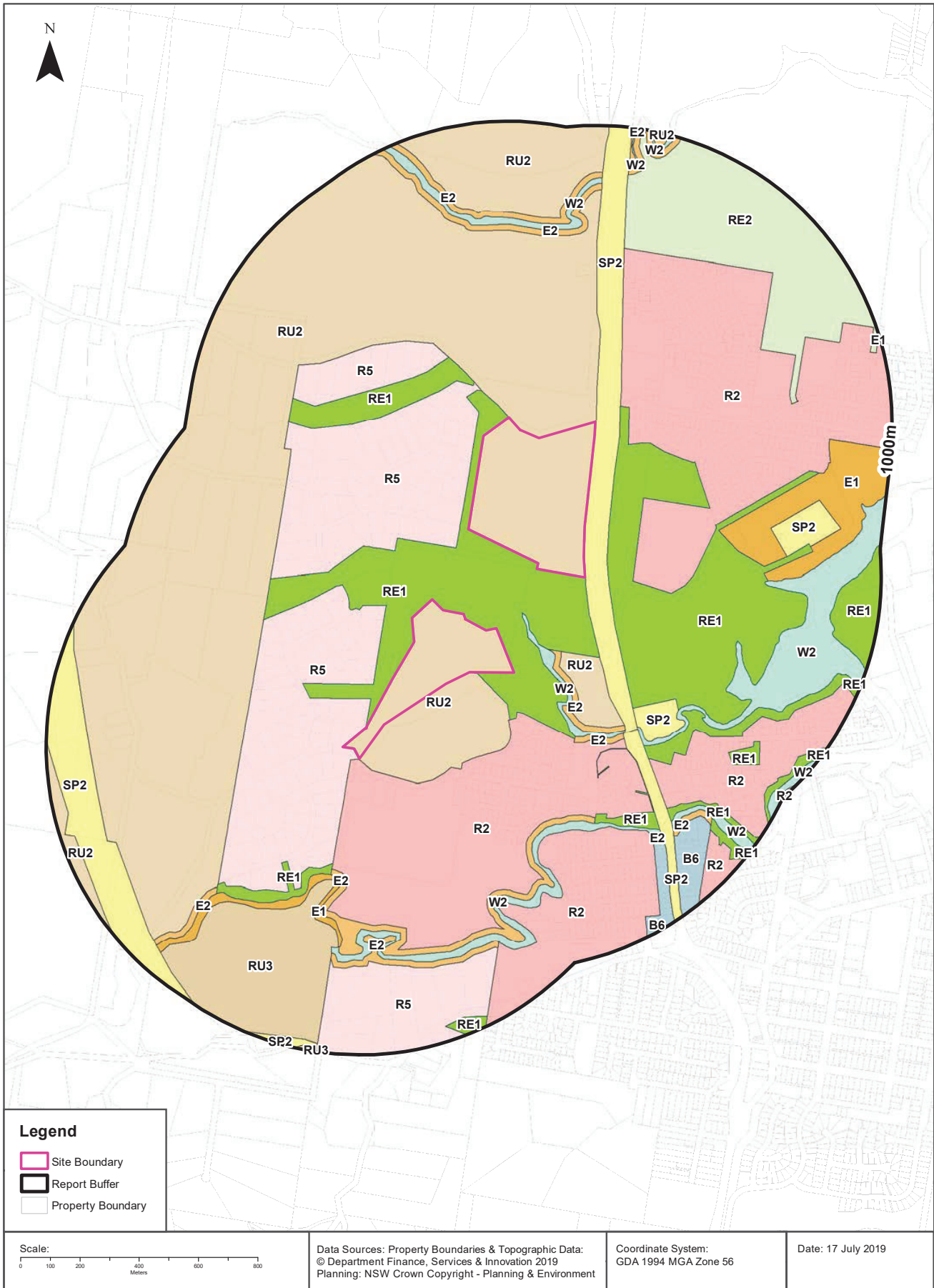
What SEPP State Significant Precincts exist within the dataset buffer?

Map Id	Precinct	EPI Name	Published Date	Commenced Date	Currency Date	Amendment	Distance	Direction
N/A	No Records in Buffer							

State Environment Planning Policy Data Source: NSW Crown Copyright - Planning & Environment  
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# EPI Planning Zones

Newmans Road & Barkhut Road, Woolgoolga, NSW 2456



# Environmental Planning Instrument

Newmans Road & Barkhut Road, Woolgoolga, NSW 2456

## Land Zoning

What EPI Land Zones exist within the dataset buffer?

Zone	Description	Purpose	EPI Name	Published Date	Commenced Date	Currency Date	Amendment	Distance	Direction
RU2	Rural Landscape		Coffs Harbour Local Environmental Plan 2013	27/09/2013	27/09/2013	10/05/2019		0m	Onsite
RU2	Rural Landscape		Coffs Harbour Local Environmental Plan 2013	09/02/2018	09/02/2018	10/05/2019	Amendment No 9	0m	Onsite
R5	Large Lot Residential		Coffs Harbour Local Environmental Plan 2013	09/02/2018	09/02/2018	10/05/2019	Amendment No 9	0m	South West
RE1	Public Recreation		Coffs Harbour Local Environmental Plan 2013	09/02/2018	09/02/2018	10/05/2019	Amendment No 9	0m	South West
SP2	Infrastructure	Classified Road	Coffs Harbour Local Environmental Plan 2013	27/09/2013	27/09/2013	10/05/2019		0m	North
R2	Low Density Residential		Coffs Harbour Local Environmental Plan 2013	09/02/2018	09/02/2018	10/05/2019	Amendment No 9	5m	South
R5	Large Lot Residential		Coffs Harbour Local Environmental Plan 2013	27/09/2013	27/09/2013	10/05/2019		28m	North West
RE1	Public Recreation		Coffs Harbour Local Environmental Plan 2013	27/09/2013	27/09/2013	10/05/2019		77m	East
W2	Recreational Waterways		Coffs Harbour Local Environmental Plan 2013	27/09/2013	27/09/2013	10/05/2019		88m	South East
R2	Low Density Residential		Coffs Harbour Local Environmental Plan 2013	27/09/2013	27/09/2013	10/05/2019		99m	North East
E2	Environmental Conservation		Coffs Harbour Local Environmental Plan 2013	27/09/2013	27/09/2013	10/05/2019		130m	South East
RU2	Rural Landscape		Coffs Harbour Local Environmental Plan 2013	27/09/2013	27/09/2013	10/05/2019		153m	South East
RE1	Public Recreation		Coffs Harbour Local Environmental Plan 2013	27/09/2013	27/09/2013	10/05/2019		160m	North West
R5	Large Lot Residential		Coffs Harbour Local Environmental Plan 2013	27/09/2013	27/09/2013	10/05/2019		284m	North West
E2	Environmental Conservation		Coffs Harbour Local Environmental Plan 2013	27/09/2013	27/09/2013	10/05/2019		298m	South East
RE1	Public Recreation		Coffs Harbour Local Environmental Plan 2013	27/09/2013	27/09/2013	10/05/2019		366m	South West
E2	Environmental Conservation		Coffs Harbour Local Environmental Plan 2013	27/09/2013	27/09/2013	10/05/2019		385m	South
RE1	Public Recreation		Coffs Harbour Local Environmental Plan 2013	27/09/2013	27/09/2013	10/05/2019		398m	South East
E1	National Parks and Nature Reserves		Coffs Harbour Local Environmental Plan 2013	27/09/2013	27/09/2013	10/05/2019		405m	South West
RU3	Forestry		Coffs Harbour Local Environmental Plan 2013	27/09/2013	27/09/2013	10/05/2019		417m	South West
SP2	Infrastructure	Council Activities	Coffs Harbour Local Environmental Plan 2013	27/09/2013	27/09/2013	10/05/2019		417m	South East
SP2	Infrastructure	Classified Road	Coffs Harbour Local Environmental Plan 2013	27/09/2013	27/09/2013	10/05/2019		422m	South
E1	National Parks and Nature Reserves		Coffs Harbour Local Environmental Plan 2013	27/09/2013	27/09/2013	10/05/2019		449m	North East
W2	Recreational Waterways		Coffs Harbour Local Environmental Plan 2013	27/09/2013	27/09/2013	10/05/2019		453m	East
RE1	Public Recreation		Coffs Harbour Local Environmental Plan 2013	27/09/2013	27/09/2013	10/05/2019		501m	South East
W2	Recreational Waterways		Coffs Harbour Local Environmental Plan 2013	27/09/2013	27/09/2013	10/05/2019		529m	South
R2	Low Density Residential		Coffs Harbour Local Environmental Plan 2013	27/09/2013	27/09/2013	10/05/2019		537m	South East
R2	Low Density Residential		Coffs Harbour Local Environmental Plan 2013	27/09/2013	27/09/2013	10/05/2019		557m	South

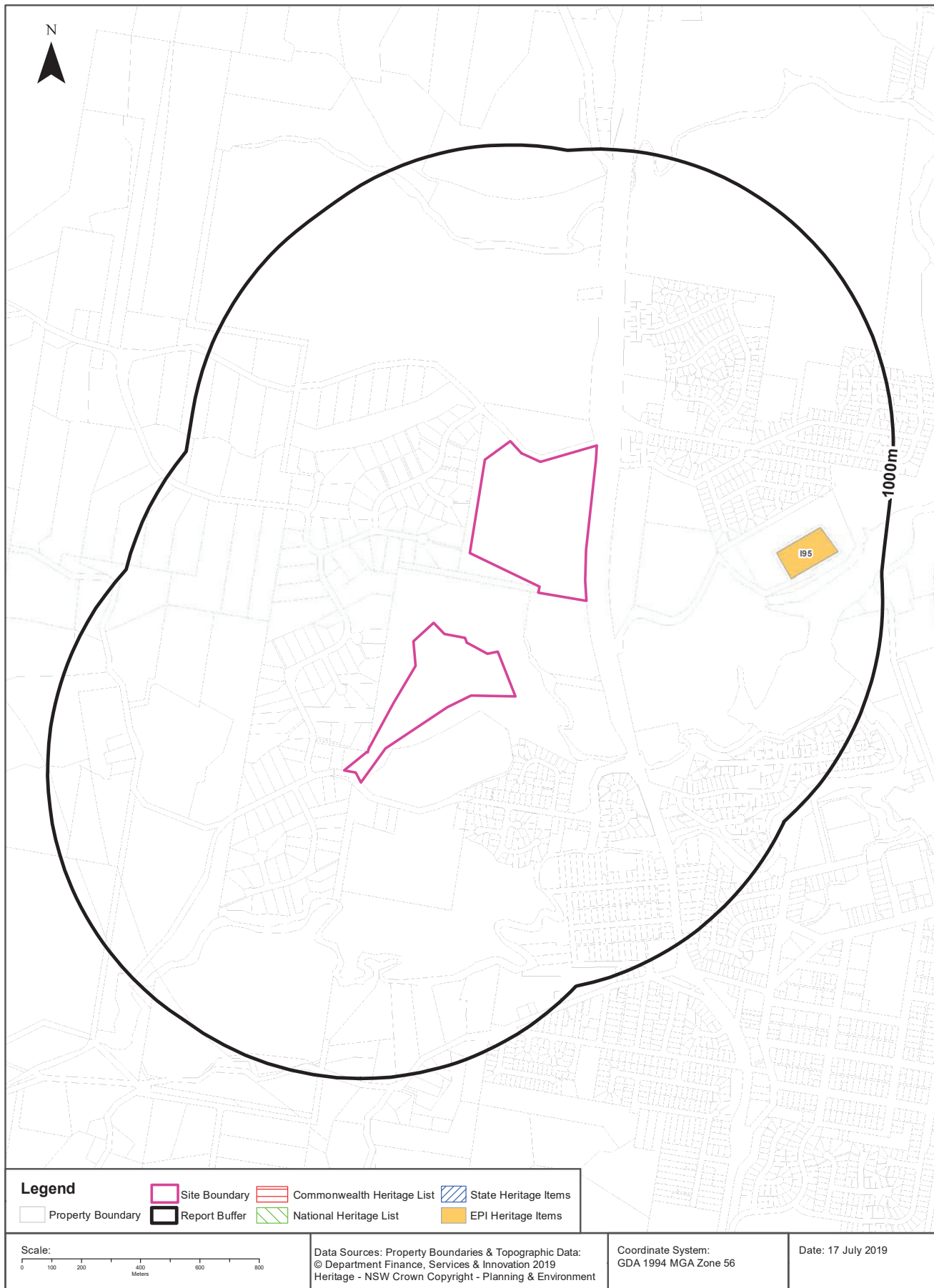


Zone	Description	Purpose	EPI Name	Published Date	Commenced Date	Currency Date	Amendment	Distance	Direction
RE2	Private Recreation		Coffs Harbour Local Environmental Plan 2013	27/09/2013	27/09/2013	10/05/2019		591m	North East
E2	Environmental Conservation		Coffs Harbour Local Environmental Plan 2013	27/09/2013	27/09/2013	10/05/2019		593m	South
E2	Environmental Conservation		Coffs Harbour Local Environmental Plan 2013	27/09/2013	27/09/2013	10/05/2019		622m	North
SP2	Infrastructure	Cemetery	Coffs Harbour Local Environmental Plan 2013	27/09/2013	27/09/2013	10/05/2019		623m	East
E2	Environmental Conservation		Coffs Harbour Local Environmental Plan 2013	27/09/2013	27/09/2013	10/05/2019		633m	South West
W2	Recreational Waterways		Coffs Harbour Local Environmental Plan 2013	27/09/2013	27/09/2013	10/05/2019		642m	North
R5	Large Lot Residential		Coffs Harbour Local Environmental Plan 2013	27/09/2013	27/09/2013	10/05/2019		683m	South
E2	Environmental Conservation		Coffs Harbour Local Environmental Plan 2013	27/09/2013	27/09/2013	10/05/2019		725m	South East
B6	Enterprise Corridor		Coffs Harbour Local Environmental Plan 2013	27/09/2013	27/09/2013	10/05/2019		742m	South East
E2	Environmental Conservation		Coffs Harbour Local Environmental Plan 2013	27/09/2013	27/09/2013	10/05/2019		746m	South East
RE1	Public Recreation		Coffs Harbour Local Environmental Plan 2013	27/09/2013	27/09/2013	10/05/2019		765m	South East
B6	Enterprise Corridor		Coffs Harbour Local Environmental Plan 2013	27/09/2013	27/09/2013	10/05/2019		766m	South East
RE1	Public Recreation		Coffs Harbour Local Environmental Plan 2013	27/09/2013	27/09/2013	10/05/2019		827m	South East
SP2	Infrastructure	Classified Road	Coffs Harbour Local Environmental Plan 2013	27/07/2018	27/07/2018	10/05/2019	Amendment No 8	829m	South
RE1	Public Recreation		Coffs Harbour Local Environmental Plan 2013	27/09/2013	27/09/2013	10/05/2019		836m	East
E2	Environmental Conservation		Coffs Harbour Local Environmental Plan 2013	27/09/2013	27/09/2013	10/05/2019		840m	North East
R2	Low Density Residential		Coffs Harbour Local Environmental Plan 2013	27/09/2013	27/09/2013	10/05/2019		846m	South East
W2	Recreational Waterways		Coffs Harbour Local Environmental Plan 2013	27/09/2013	27/09/2013	10/05/2019		860m	North East
E2	Environmental Conservation		Coffs Harbour Local Environmental Plan 2013	27/09/2013	27/09/2013	10/05/2019		863m	North East
RE1	Public Recreation		Coffs Harbour Local Environmental Plan 2013	27/09/2013	27/09/2013	10/05/2019		940m	South
RU2	Rural Landscape		Coffs Harbour Local Environmental Plan 2013	27/09/2013	27/09/2013	10/05/2019		950m	West
RU2	Rural Landscape		Coffs Harbour Local Environmental Plan 2013	27/09/2013	27/09/2013	10/05/2019		978m	North East
RU3	Forestry		Coffs Harbour Local Environmental Plan 2013	27/09/2013	27/09/2013	10/05/2019		985m	South

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# Heritage Items

Newmans Road & Barkhut Road, Woolgoolga, NSW 2456



## Heritage

Newmans Road & Barkhut Road, Woolgoolga, NSW 2456

### Commonwealth Heritage List

What are the Commonwealth Heritage List Items located within the dataset buffer?

Place Id	Name	Address	Place File No	Class	Status	Register Date	Distance	Direction
N/A	No records in buffer							

Heritage Data Source: Australian Government Department of the Environment and Energy - Heritage Branch  
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### National Heritage List

What are the National Heritage List Items located within the dataset buffer?  
Note. Please click on Place Id to activate a hyperlink to online website.

Place Id	Name	Address	Place File No	Class	Status	Register Date	Distance	Direction
N/A	No records in buffer							

Heritage Data Source: Australian Government Department of the Environment and Energy - Heritage Branch  
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### State Heritage Register - Curtilages

What are the State Heritage Register Items located within the dataset buffer?

Map Id	Name	Address	LGA	Listing Date	Listing No	Plan No	Distance	Direction
N/A	No records in buffer							

Heritage Data Source: NSW Crown Copyright - Office of Environment & Heritage  
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### Environmental Planning Instrument - Heritage

What are the EPI Heritage Items located within the dataset buffer?

Map Id	Name	Classification	Significance	EPI Name	Published Date	Commenced Date	Currency Date	Distance	Direction
195	Woolgoolga Cemetery	Item - General	Local	Coffs Harbour Local Environmental Plan 2013	27/09/2013	27/09/2013	30/11/2018	637m	East

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# Natural Hazards - Bush Fire Prone Land

Newmans Road & Barkhut Road, Woolgoolga, NSW 2456



## Natural Hazards

Newmans Road & Barkhut Road, Woolgoolga, NSW 2456

### Bush Fire Prone Land

What are the nearest Bush Fire Prone Land Categories that exist within the dataset buffer?

Bush Fire Prone Land Category	Distance	Direction
Vegetation Buffer	0m	Onsite
Vegetation Category 1	0m	Onsite
Vegetation Category 2	0m	Onsite

NSW Bush Fire Prone Land - © NSW Rural Fire Service under Creative Commons 4.0 International Licence

# Ecological Constraints - Vegetation & Ramsar Wetlands

Newmans Road & Barkhut Road, Woolgoolga, NSW 2456



## Ecological Constraints

Newmans Road & Barkhut Road, Woolgoolga, NSW 2456

### Vegetation of Coffs Harbour LGA

What Vegetation of Coffs Harbour LGA exists within the dataset buffer?

Vegetation Code	Vegetation Category	Species	Source	Distance	Direction
N11A	Tall Open Forest	<i>Eucalyptus propinqua</i> , <i>E. microcorys</i> .	Veg Mapping. Fisher 1996	0m	Onsite
N27	Tall Open Forest	<i>Eucalyptus grandis</i>	Veg Mapping. Fisher 1996	0m	Onsite
N2A	Open Forest	<i>Eucalyptus pilularis</i>	Veg Mapping. Fisher 1996	0m	Onsite
ST	Scattered Trees		Veg Mapping. Fisher 1996	0m	Onsite
UNtyped	Untyped		Veg Mapping. Fisher 1996	0m	Onsite
N7	Tall Open Forest	<i>Eucalyptus pilularis</i> , <i>E. microcorys</i>	Veg Mapping. Fisher 1996	29m	South West
N44A	Open Forest	<i>Eucalyptus pilularis</i> , <i>E. resinifera</i> , <i>Corymbia intermedia</i>	Veg Mapping. Fisher 1996	60m	East
N67B	Open Forest	<i>Eucalyptus siderophloia</i> , <i>E. propinqua</i>	Veg Mapping. Fisher 1996	74m	North East
N67A	Tall Open Forest	<i>Eucalyptus siderophloia</i> , <i>E. propinqua</i>	Veg Mapping. Fisher 1996	275m	North West
N11A/ST	Tall Open Forest	<i>Eucalyptus propinqua</i> , <i>E. microcorys</i> .	Veg Mapping. Fisher 1996	339m	South West
N20	Swamp Forest	<i>Melaleuca quinquenervia</i>	Veg Mapping. Fisher 1996	371m	South East
N67C/ST	Open Forest	<i>Eucalyptus propinqua</i> , <i>E. siderophloia</i> , <i>Corymbia maculata</i>	Veg Mapping. Fisher 1996	386m	South West
N67C	Open Forest	<i>Eucalyptus propinqua</i> , <i>E. siderophloia</i> , <i>Corymbia maculata</i>	Veg Mapping. Fisher 1996	453m	South West
N50	Swamp Forest	<i>Melaleuca</i> sp., <i>Casuarina glauca</i> , <i>Eucalyptus robusta</i>	Veg Mapping. Fisher 1996	478m	East
N44A/ST	Open Forest	<i>Eucalyptus pilularis</i> , <i>E. resinifera</i> , <i>Corymbia intermedia</i>	Veg Mapping. Fisher 1996	637m	North East
N1B	Open Forest	<i>Eucalyptus tereticornis</i> , <i>Angophora subvelutina</i> , <i>E. robusta</i> , <i>Lophostemon suaveolens</i>	Veg Mapping. Fisher 1996	683m	North East
R	Regrowth		Veg Mapping. Fisher 1996	841m	North
N75A	Foredune Complex	<i>Banksia integrifolia</i> , <i>Acacia sophorae</i> , * <i>Chrysanthemoides monnifera</i> *	Veg Mapping. Fisher 1996	877m	East
N26A	Swamp Forest	<i>Casuarina glauca</i> .	Veg Mapping. Fisher 1996	931m	South East

Native Vegetation of Coffs Harbour : NSW Office of Environment and Heritage

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## Ramsar Wetlands

What Ramsar Wetland areas exist within the dataset buffer?

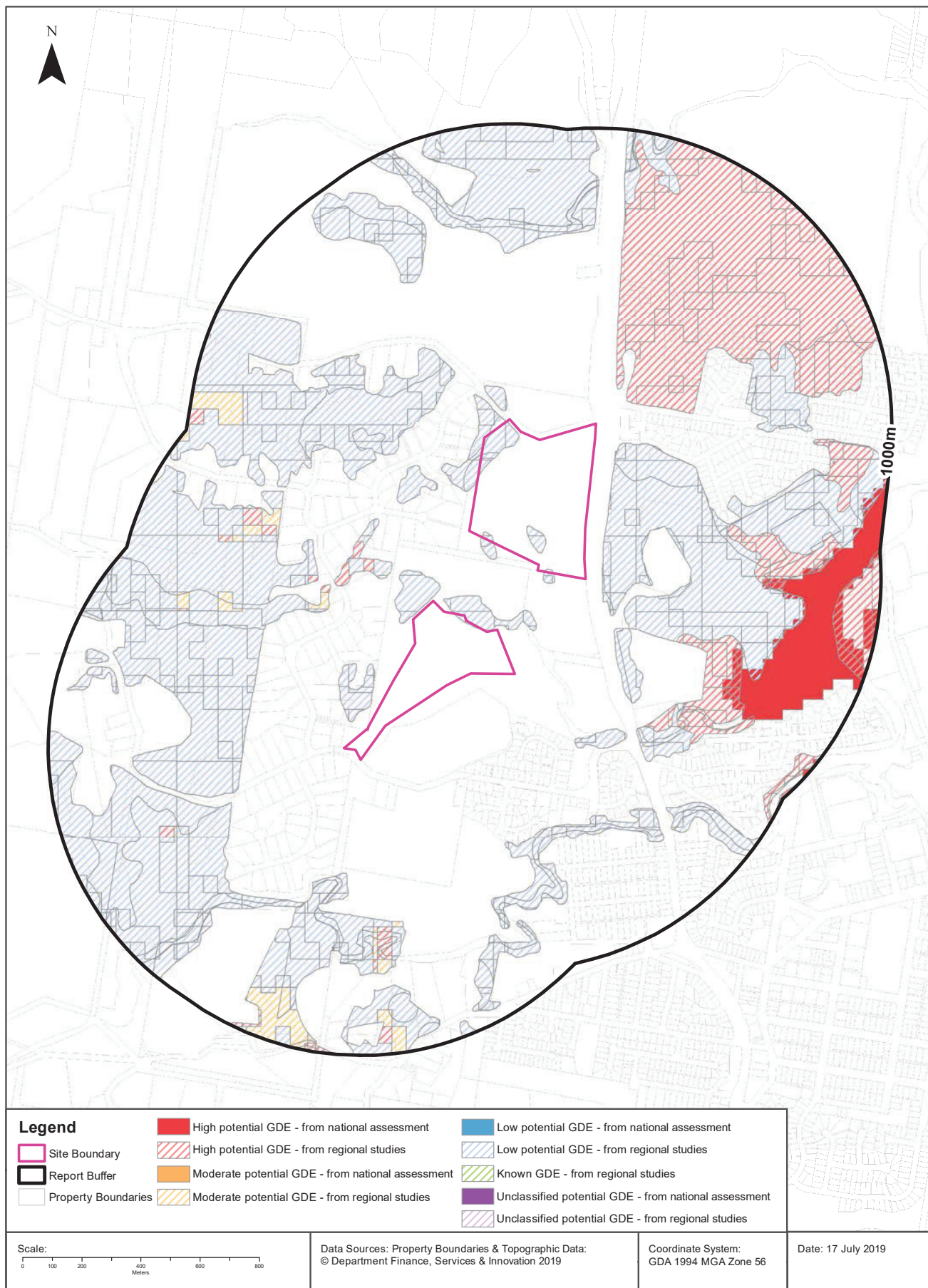
Map Id	Ramsar Name	Wetland Name	Designation Date	Source	Distance	Direction
N/A	No records in buffer					

Ramsar Wetlands Data Source: © Commonwealth of Australia - Department of Environment



# Ecological Constraints - Groundwater Dependent Ecosystems Atlas

Newmans Road & Barkhut Road, Woolgoolga, NSW 2456



# Ecological Constraints

Newmans Road & Barkhut Road, Woolgoolga, NSW 2456

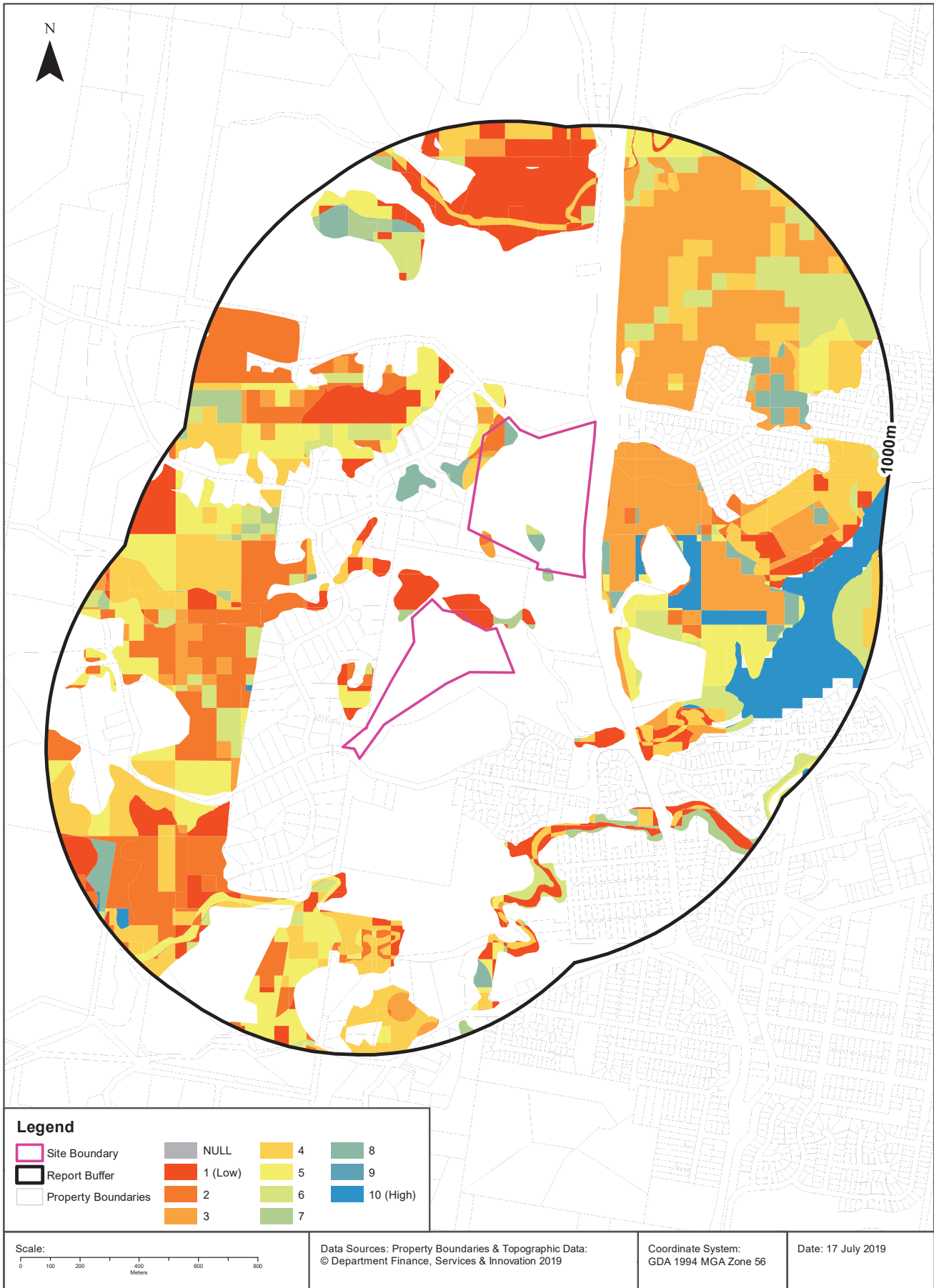
## Groundwater Dependent Ecosystems Atlas

Type	GDE Potential	Geomorphology	Ecosystem Type	Aquifer Geology	Distance
Terrestrial	Low potential GDE - from regional studies	Coastal lowlands on weak sedimentary rocks, with littoral and alluvial plains.	Vegetation		0m
Terrestrial	Low potential GDE - from regional studies	Plateau flank dissected into narrow strike ridges and valleys.	Vegetation		0m
Terrestrial	High potential GDE - from regional studies	Plateau flank dissected into narrow strike ridges and valleys.	Vegetation		129m
Terrestrial	Moderate potential GDE - from regional studies	Dissected plateau margin on granite and metamorphic rocks.	Vegetation		287m
Aquatic	High potential GDE - from national assessment	Dissected plateau margin on granite and metamorphic rocks.	Wetland		549m

Groundwater Dependent Ecosystems Atlas Data Source: The Bureau of Meteorology  
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# Ecological Constraints - Inflow Dependent Ecosystems Likelihood

Newmans Road & Barkhut Road, Woolgoolga, NSW 2456



## Ecological Constraints

Newmans Road & Barkhut Road, Woolgoolga, NSW 2456

### Inflow Dependent Ecosystems Likelihood

Type	IDE Likelihood	Geomorphology	Ecosystem Type	Aquifer Geology	Distance
Terrestrial	1	Plateau flank dissected into narrow strike ridges and valleys.	Vegetation		0m
Terrestrial	2	Coastal lowlands on weak sedimentary rocks, with littoral and alluvial plains.	Vegetation		0m
Terrestrial	2	Plateau flank dissected into narrow strike ridges and valleys.	Vegetation		0m
Terrestrial	3	Plateau flank dissected into narrow strike ridges and valleys.	Vegetation		0m
Terrestrial	4	Plateau flank dissected into narrow strike ridges and valleys.	Vegetation		0m
Terrestrial	5	Plateau flank dissected into narrow strike ridges and valleys.	Vegetation		0m
Terrestrial	6	Plateau flank dissected into narrow strike ridges and valleys.	Vegetation		0m
Terrestrial	7	Plateau flank dissected into narrow strike ridges and valleys.	Vegetation		0m
Terrestrial	8	Plateau flank dissected into narrow strike ridges and valleys.	Vegetation		0m
Terrestrial	10	Coastal lowlands on weak sedimentary rocks, with littoral and alluvial plains.	Vegetation		170m
Aquatic	10	Dissected plateau margin on granite and metamorphic rocks.	Wetland		549m
Aquatic	4	Dissected plateau margin on granite and metamorphic rocks.	Wetland		943m

Inflow Dependent Ecosystems Likelihood Data Source: The Bureau of Meteorology  
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# Ecological Constraints

Newmans Road & Barkhut Road, Woolgoolga, NSW 2456

## NSW BioNet Atlas

Species on the NSW BioNet Atlas that have a NSW or federal conservation status, a NSW sensitivity status, or are listed under a migratory species agreement, and are within 10km of the site?

Kingdom	Class	Scientific	Common	NSW Conservation Status	NSW Sensitivity Class	Federal Conservation Status	Migratory Species Agreements
Animalia	Amphibia	Crinia tinnula	Wallum Froglet	Vulnerable	Not Sensitive	Not Listed	
Animalia	Amphibia	Mixophyes iteratus	Giant Barred Frog	Endangered	Category 2	Endangered	
Animalia	Aves	Anous stolidus	Common Noddy	Not Listed	Not Sensitive	Not Listed	CAMBA;JAMBA
Animalia	Aves	Anthochaera phrygia	Regent Honeyeater	Critically Endangered	Not Sensitive	Critically Endangered	
Animalia	Aves	Apus pacificus	Fork-tailed Swift	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA;JAMBA
Animalia	Aves	Ardea ibis	Cattle Egret	Not Listed	Not Sensitive	Not Listed	CAMBA;JAMBA
Animalia	Aves	Ardenna carneipes	Flesh-footed Shearwater	Vulnerable	Not Sensitive	Not Listed	ROKAMBA;JAMBA
Animalia	Aves	Ardenna pacificus	Wedge-tailed Shearwater	Not Listed	Not Sensitive	Not Listed	JAMBA
Animalia	Aves	Ardenna tenuirostris	Short-tailed Shearwater	Not Listed	Not Sensitive	Not Listed	ROKAMBA;JAMBA
Animalia	Aves	Arenaria interpres	Ruddy Turnstone	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA;JAMBA
Animalia	Aves	Artamus cyanopterus cyanopterus	Dusky Woodswallow	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Burhinus grallarius	Bush Stone-curlew	Endangered	Not Sensitive	Not Listed	
Animalia	Aves	Calidris ferruginea	Curlew Sandpiper	Endangered	Not Sensitive	Critically Endangered	ROKAMBA;CAMBA;JAMBA
Animalia	Aves	Calidris tenuirostris	Great Knot	Vulnerable	Not Sensitive	Critically Endangered	ROKAMBA;CAMBA;JAMBA
Animalia	Aves	Calyptorhynchus lathamii	Glossy Black-Cockatoo	Vulnerable	Category 2	Not Listed	
Animalia	Aves	Charadrius mongolus	Lesser Sandplover	Vulnerable	Not Sensitive	Endangered	ROKAMBA;CAMBA;JAMBA
Animalia	Aves	Climacteris picumnus victoriae	Brown Treecreeper (eastern subspecies)	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Coracina lineata	Barred Cuckoo-shrike	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Daphoenositta chrysoptera	Varied Sittella	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Dromaius novaehollandiae	Emu	Endangered Population	Not Sensitive	Not Listed	
Animalia	Aves	Egretta sacra	Eastern Reef Egret	Not Listed	Not Sensitive	Not Listed	CAMBA
Animalia	Aves	Ephippiorhynchus asiaticus	Black-necked Stork	Endangered	Not Sensitive	Not Listed	
Animalia	Aves	Gelochelidon nilotica	Gull-billed Tern	Not Listed	Not Sensitive	Not Listed	CAMBA
Animalia	Aves	Glossopsitta pusilla	Little Lorikeet	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Grantiella picta	Painted Honeyeater	Vulnerable	Not Sensitive	Vulnerable	
Animalia	Aves	Grus rubicunda	Brolga	Vulnerable	Not Sensitive	Not Listed	

Kingdom	Class	Scientific	Common	NSW Conservation Status	NSW Sensitivity Class	Federal Conservation Status	Migratory Species Agreements
Animalia	Aves	Gygis alba	White Tern	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Haematopus fuliginosus	Sooty Oystercatcher	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Haematopus longirostris	Pied Oystercatcher	Endangered	Not Sensitive	Not Listed	
Animalia	Aves	Haliaeetus leucogaster	White-bellied Sea-Eagle	Vulnerable	Not Sensitive	Not Listed	CAMBA
Animalia	Aves	Hieraaetus morphnoides	Little Eagle	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Hirundapus caudacutus	White-throated Needletail	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Hydroprogne caspia	Caspian Tern	Not Listed	Not Sensitive	Not Listed	CAMBA;JAMBA
Animalia	Aves	Irediparra gallinacea	Comb-crested Jacana	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Ixobrychus flavicollis	Black Bittern	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Lathamus discolor	Swift Parrot	Endangered	Category 3	Critically Endangered	
Animalia	Aves	Limosa lapponica	Bar-tailed Godwit	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Limosa limosa	Black-tailed Godwit	Vulnerable	Not Sensitive	Not Listed	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Lophoictinia isura	Square-tailed Kite	Vulnerable	Category 3	Not Listed	
Animalia	Aves	Macronectes giganteus	Southern Giant Petrel	Endangered	Not Sensitive	Endangered	
Animalia	Aves	Melithreptus gularis gularis	Black-chinned Honeyeater (eastern subspecies)	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Merops ornatus	Rainbow Bee-eater	Not Listed	Not Sensitive	Not Listed	JAMBA
Animalia	Aves	Neophema pulchella	Turquoise Parrot	Vulnerable	Category 3	Not Listed	
Animalia	Aves	Ninox strenua	Powerful Owl	Vulnerable	Category 3	Not Listed	
Animalia	Aves	Numenius phaeopus	Whimbrel	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Oceanites oceanicus	Wilson's Storm-Petrel	Not Listed	Not Sensitive	Not Listed	JAMBA
Animalia	Aves	Onychoprion fuscata	Sooty Tern	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Pandion cristatus	Eastern Osprey	Vulnerable	Category 3	Not Listed	
Animalia	Aves	Petroica boodang	Scarlet Robin	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Pezoporus wallicus wallicus	Eastern Ground Parrot	Vulnerable	Category 3	Not Listed	
Animalia	Aves	Phaethon lepturus	White-tailed Tropicbird	Not Listed	Not Sensitive	Not Listed	CAMBA;JAMBA
Animalia	Aves	Plegadis falcinellus	Glossy Ibis	Not Listed	Not Sensitive	Not Listed	CAMBA
Animalia	Aves	Pluvialis fulva	Pacific Golden Plover	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Pluvialis squatarola	Grey Plover	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Pomatostomus temporalis temporalis	Grey-crowned Babbler (eastern subspecies)	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Ptilinopus magnificus	Wompoo Fruit-Dove	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Ptilinopus regina	Rose-crowned Fruit-Dove	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Ptilinopus superbus	Superb Fruit-Dove	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Stercorarius longicaudus	Long-tailed Jaeger	Not Listed	Not Sensitive	Not Listed	JAMBA

Kingdom	Class	Scientific	Common	NSW Conservation Status	NSW Sensitivity Class	Federal Conservation Status	Migratory Species Agreements
Animalia	Aves	<i>Sterna hirundo</i>	Common Tern	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	<i>Sternula albifrons</i>	Little Tern	Endangered	Not Sensitive	Not Listed	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	<i>Stictonetta naevosa</i>	Freckled Duck	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	<i>Todiramphus chloris</i>	Collared Kingfisher	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	<i>Tringa brevipes</i>	Grey-tailed Tattler	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	<i>Tringa incana</i>	Wandering Tattler	Not Listed	Not Sensitive	Not Listed	JAMBA
Animalia	Aves	<i>Tyto novaehollandiae</i>	Masked Owl	Vulnerable	Category 3	Not Listed	
Animalia	Aves	<i>Tyto tenebricosa</i>	Sooty Owl	Vulnerable	Category 3	Not Listed	
Animalia	Mammalia	<i>Aepyprymnus rufescens</i>	Rufous Bettong	Vulnerable	Not Sensitive	Not Listed	
Animalia	Mammalia	<i>Arctocephalus forsteri</i>	New Zealand Fur-seal	Vulnerable	Not Sensitive	Not Listed	
Animalia	Mammalia	<i>Arctocephalus pusillus doriferus</i>	Australian Fur-seal	Vulnerable	Not Sensitive	Not Listed	
Animalia	Mammalia	<i>Cercartetus nanus</i>	Eastern Pygmy-possum	Vulnerable	Not Sensitive	Not Listed	
Animalia	Mammalia	<i>Chalinolobus nigrogriseus</i>	Hoary Wattleed Bat	Vulnerable	Not Sensitive	Not Listed	
Animalia	Mammalia	<i>Dasyurus maculatus</i>	Spotted-tailed Quoll	Vulnerable	Not Sensitive	Endangered	
Animalia	Mammalia	<i>Dugong dugon</i>	Dugong	Endangered	Not Sensitive	Not Listed	
Animalia	Mammalia	<i>Eubalaena australis</i>	Southern Right Whale	Endangered	Not Sensitive	Endangered	
Animalia	Mammalia	<i>Falsistrellus tasmaniensis</i>	Eastern False Pipistrelle	Vulnerable	Not Sensitive	Not Listed	
Animalia	Mammalia	<i>Kerivoula papuensis</i>	Golden-tipped Bat	Vulnerable	Not Sensitive	Not Listed	
Animalia	Mammalia	<i>Megaptera novaeangliae</i>	Humpback Whale	Vulnerable	Not Sensitive	Vulnerable	
Animalia	Mammalia	<i>Micronomus norfolkensis</i>	Eastern Coastal Free-tailed Bat	Vulnerable	Not Sensitive	Not Listed	
Animalia	Mammalia	<i>Miniopterus australis</i>	Little Bent-winged Bat	Vulnerable	Not Sensitive	Not Listed	
Animalia	Mammalia	<i>Miniopterus orianae oceanensis</i>	Large Bent-winged Bat	Vulnerable	Not Sensitive	Not Listed	
Animalia	Mammalia	<i>Myotis macropus</i>	Southern Myotis	Vulnerable	Not Sensitive	Not Listed	
Animalia	Mammalia	<i>Nyctophilus bifax</i>	Eastern Long-eared Bat	Vulnerable	Not Sensitive	Not Listed	
Animalia	Mammalia	<i>Petauroides volans</i>	Greater Glider	Not Listed	Not Sensitive	Vulnerable	
Animalia	Mammalia	<i>Petaurus australis</i>	Yellow-bellied Glider	Vulnerable	Not Sensitive	Not Listed	
Animalia	Mammalia	<i>Petaurus norfolkensis</i>	Squirrel Glider	Vulnerable	Not Sensitive	Not Listed	
Animalia	Mammalia	<i>Phascogale tapoatafa</i>	Brush-tailed Phascogale	Vulnerable	Not Sensitive	Not Listed	
Animalia	Mammalia	<i>Phascogale cinereus</i>	Koala	Vulnerable	Not Sensitive	Vulnerable	
Animalia	Mammalia	<i>Planigale maculata</i>	Common Planigale	Vulnerable	Not Sensitive	Not Listed	
Animalia	Mammalia	<i>Potorous tridactylus</i>	Long-nosed Potoroo	Vulnerable	Not Sensitive	Vulnerable	
Animalia	Mammalia	<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox	Vulnerable	Not Sensitive	Vulnerable	
Animalia	Mammalia	<i>Saccolaimus flaviventris</i>	Yellow-bellied Sheath-tail-bat	Vulnerable	Not Sensitive	Not Listed	
Animalia	Mammalia	<i>Scoteanax rueppellii</i>	Greater Broad-nosed Bat	Vulnerable	Not Sensitive	Not Listed	

Kingdom	Class	Scientific	Common	NSW Conservation Status	NSW Sensitivity Class	Federal Conservation Status	Migratory Species Agreements
Animalia	Mammalia	Syconycteris australis	Common Blossom-bat	Vulnerable	Not Sensitive	Not Listed	
Animalia	Mammalia	Vespadelus troughtoni	Eastern Cave Bat	Vulnerable	Not Sensitive	Not Listed	
Animalia	Reptilia	Cacophis harriettae	White-crowned Snake	Vulnerable	Not Sensitive	Not Listed	
Animalia	Reptilia	Caretta caretta	Loggerhead Turtle	Endangered	Not Sensitive	Endangered	
Animalia	Reptilia	Chelonia mydas	Green Turtle	Vulnerable	Not Sensitive	Vulnerable	
Animalia	Reptilia	Eretmochelys imbricata	Hawksbill Turtle	Not Listed	Not Sensitive	Vulnerable	
Animalia	Reptilia	Hoplocephalus stephensii	Stephens' Banded Snake	Vulnerable	Not Sensitive	Not Listed	
Plantae	Flora	Acronychia littoralis	Scented Acronychia	Endangered	Not Sensitive	Endangered	
Plantae	Flora	Angophora robur	Sandstone Rough-barked Apple	Vulnerable	Not Sensitive	Vulnerable	
Plantae	Flora	Belvisia mucronata	Needle-leaf Fern	Endangered	Not Sensitive	Not Listed	
Plantae	Flora	Boronia umbellata	Orara Boronia	Vulnerable	Not Sensitive	Vulnerable	
Plantae	Flora	Chamaesyce psammogeton	Sand Spurge	Endangered	Not Sensitive	Not Listed	
Plantae	Flora	Eleocharis tetraquetra	Square-stemmed Spike-rush	Endangered	Not Sensitive	Not Listed	
Plantae	Flora	Hicksbeachia pinnatifolia	Red Boppel Nut	Vulnerable	Not Sensitive	Vulnerable	
Plantae	Flora	Lindernia alsinoides	Noah's False Chickweed	Endangered	Not Sensitive	Not Listed	
Plantae	Flora	Lindsaea incisa	Slender Screw Fern	Endangered	Category 3	Not Listed	
Plantae	Flora	Macadamia tetraphylla	Rough-shelled Bush Nut	Vulnerable	Not Sensitive	Vulnerable	
Plantae	Flora	Marsdenia longiloba	Slender Marsdenia	Endangered	Not Sensitive	Vulnerable	
Plantae	Flora	Maundia triglochoides		Vulnerable	Not Sensitive	Not Listed	
Plantae	Flora	Niemeyera whitei	Rusty Plum, Plum Boxwood	Vulnerable	Not Sensitive	Not Listed	
Plantae	Flora	Parsonia dorrigoensis	Milky Silkpod	Vulnerable	Not Sensitive	Endangered	
Plantae	Flora	Phaius australis	Southern Swamp Orchid	Endangered	Category 2	Endangered	
Plantae	Flora	Pultenaea maritima	Coast Headland Pea	Vulnerable	Not Sensitive	Not Listed	
Plantae	Flora	Quassia sp. Moonee Creek	Moonee Quassia	Endangered	Not Sensitive	Endangered	
Plantae	Flora	Rhodamnia rubescens	Scrub Turpentine	Critically Endangered	Not Sensitive	Not Listed	
Plantae	Flora	Rhodomyrtus psidioides	Native Guava	Critically Endangered	Not Sensitive	Not Listed	
Plantae	Flora	Senna acclinis	Rainforest Cassia	Endangered	Not Sensitive	Not Listed	
Plantae	Flora	Sophora tomentosa	Silverbush	Endangered	Not Sensitive	Not Listed	
Plantae	Flora	Thesium australe	Austral Toadflax	Vulnerable	Not Sensitive	Vulnerable	
Plantae	Flora	Typhonium sp. aff. brownii	Stinky Lily	Endangered	Category 3	Not Listed	
Plantae	Flora	Zieria prostrata	Headland Zieria	Endangered	Not Sensitive	Endangered	

Data does not include NSW category 1 sensitive species.  
NSW BioNet: © State of NSW and Office of Environment and Heritage  
Data obtained 17/07/2019



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  12. These Terms are subject to New South Wales law.

# Appendix C

## Aerial Photographs



1964



1974



1981



2000





# Appendix D

## Laboratory Report

Whitehead & Associates  
Unit 2 / 13 Industrial Drive  
North Boambee Valley  
NSW 2450



NATA Accredited  
Accreditation Number 1261  
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing  
The results of the tests, calibrations and/or  
measurements included in this document are traceable  
to Australian/national standards.

Attention: Strider Duerinckx

Report 667917-S  
Project name NEWMANS RD  
Project ID 2438  
Received Date Jul 26, 2019

Client Sample ID			S-1 Soil	S-2 Soil
Sample Matrix				
Eurofins Sample No.			S19-JI38480	S19-JI38481
Date Sampled			Jul 25, 2019	Jul 25, 2019
Test/Reference	LOR	Unit		
<b>Organochlorine Pesticides</b>				
Chlordanes - Total	0.1	mg/kg	< 0.1	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.05	< 0.05
4.4'-DDE	0.05	mg/kg	< 0.05	< 0.05
4.4'-DDT	0.05	mg/kg	< 0.05	< 0.05
a-BHC	0.05	mg/kg	< 0.05	< 0.05
Aldrin	0.05	mg/kg	< 0.05	< 0.05
b-BHC	0.05	mg/kg	< 0.05	< 0.05
d-BHC	0.05	mg/kg	< 0.05	< 0.05
Dieldrin	0.05	mg/kg	< 0.05	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05
Endrin	0.05	mg/kg	< 0.05	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05
g-BHC (Lindane)	0.05	mg/kg	< 0.05	< 0.05
Heptachlor	0.05	mg/kg	< 0.05	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05
Methoxychlor	0.05	mg/kg	< 0.05	< 0.05
Toxaphene	1	mg/kg	< 1	< 1
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1
Dibutylchloroendate (surr.)	1	%	123	77
Tetrachloro-m-xylene (surr.)	1	%	112	58
<b>Organophosphorus Pesticides</b>				
Azinphos-methyl	0.2	mg/kg	< 0.2	< 0.2
Bolstar	0.2	mg/kg	< 0.2	< 0.2
Chlorfenvinphos	0.2	mg/kg	< 0.2	< 0.2
Chlorpyrifos	0.2	mg/kg	< 0.2	< 0.2
Chlorpyrifos-methyl	0.2	mg/kg	< 0.2	< 0.2
Coumaphos	2	mg/kg	< 2	< 2
Demeton-S	0.2	mg/kg	< 0.2	< 0.2

Client Sample ID			S-1	S-2
Sample Matrix			Soil	Soil
Eurofins Sample No.			S19-JI38480	S19-JI38481
Date Sampled			Jul 25, 2019	Jul 25, 2019
Test/Reference	LOR	Unit		
<b>Organophosphorus Pesticides</b>				
Demeton-O	0.2	mg/kg	< 0.2	< 0.2
Diazinon	0.2	mg/kg	< 0.2	< 0.2
Dichlorvos	0.2	mg/kg	< 0.2	< 0.2
Dimethoate	0.2	mg/kg	< 0.2	< 0.2
Disulfoton	0.2	mg/kg	< 0.2	< 0.2
EPN	0.2	mg/kg	< 0.2	< 0.2
Ethion	0.2	mg/kg	< 0.2	< 0.2
Ethoprop	0.2	mg/kg	< 0.2	< 0.2
Ethyl parathion	0.2	mg/kg	< 0.2	< 0.2
Fenitrothion	0.2	mg/kg	< 0.2	< 0.2
Fensulfothion	0.2	mg/kg	< 0.2	< 0.2
Fenthion	0.2	mg/kg	< 0.2	< 0.2
Malathion	0.2	mg/kg	< 0.2	< 0.2
Merphos	0.2	mg/kg	< 0.2	< 0.2
Methyl parathion	0.2	mg/kg	< 0.2	< 0.2
Mevinphos	0.2	mg/kg	< 0.2	< 0.2
Monocrotophos	2	mg/kg	< 2	< 2
Naled	0.2	mg/kg	< 0.2	< 0.2
Omethoate	2	mg/kg	< 2	< 2
Phorate	0.2	mg/kg	< 0.2	< 0.2
Pirimiphos-methyl	0.2	mg/kg	< 0.2	< 0.2
Pyrazophos	0.2	mg/kg	< 0.2	< 0.2
Ronnel	0.2	mg/kg	< 0.2	< 0.2
Terbufos	0.2	mg/kg	< 0.2	< 0.2
Tetrachlorvinphos	0.2	mg/kg	< 0.2	< 0.2
Tokuthion	0.2	mg/kg	< 0.2	< 0.2
Trichloronate	0.2	mg/kg	< 0.2	< 0.2
Triphenylphosphate (surr.)	1	%	102	78
<b>Heavy Metals</b>				
Arsenic	2	mg/kg	5.0	3.3
Cadmium	0.4	mg/kg	< 0.4	< 0.4
Chromium	5	mg/kg	17	8.6
Copper	5	mg/kg	< 5	< 5
Lead	5	mg/kg	12	15
Mercury	0.1	mg/kg	< 0.1	< 0.1
Nickel	5	mg/kg	< 5	< 5
Zinc	5	mg/kg	11	8.4
<b>% Moisture</b>				
% Moisture	1	%	28	28

**Sample History**

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported. A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
<b>Eurofins   mgt Suite B14</b>			
Organochlorine Pesticides - Method: LTM-ORG-2220 OCP & PCB in Soil and Water (USEPA 8270)	Melbourne	Jul 30, 2019	14 Days
Organophosphorus Pesticides - Method: LTM-ORG-2200 Organophosphorus Pesticides by GC-MS (USEPA 8081)	Melbourne	Jul 30, 2019	14 Days
<b>Metals M8</b> - Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS	Melbourne	Jul 30, 2019	180 Days
<b>% Moisture</b> - Method: LTM-GEN-7080 Moisture	Melbourne	Jul 26, 2019	14 Days

<b>Company Name:</b> Whitehead & Associates	<b>Order No.:</b> 2438	<b>Received:</b> Jul 26, 2019 9:00 AM
<b>Address:</b> Unit 2 / 13 Industrial Drive North Boambee Valley NSW 2450	<b>Report #:</b> 667917	<b>Due:</b> Aug 2, 2019
	<b>Phone:</b> 02 6651 1512	<b>Priority:</b> 5 Day
<b>Project Name:</b> NEWMANS RD	<b>Fax:</b>	<b>Contact Name:</b> Strider Duerinckx
<b>Project ID:</b> 2438		

**Eurofins | mgt Analytical Services Manager : Andrew Black**

Sample Detail						Metals M8	Eurofins   mgt Suite B14	Moisture Set
<b>Melbourne Laboratory - NATA Site # 1254 &amp; 14271</b>						X	X	X
<b>Sydney Laboratory - NATA Site # 18217</b>								
<b>Brisbane Laboratory - NATA Site # 20794</b>								
<b>Perth Laboratory - NATA Site # 23736</b>								
<b>External Laboratory</b>								
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID			
1	S-1	Jul 25, 2019		Soil	S19-JI38480	X	X	X
2	S-2	Jul 25, 2019		Soil	S19-JI38481	X	X	X
<b>Test Counts</b>						2	2	2

**Internal Quality Control Review and Glossary**
**General**

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
9. This report replaces any interim results previously issued.

**Holding Times**

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

**\*\*NOTE:** pH duplicates are reported as a range NOT as RPD

**Units**

**mg/kg:** milligrams per kilogram

**mg/L:** milligrams per litre

**ug/L:** micrograms per litre

**ppm:** Parts per million

**ppb:** Parts per billion

**%:** Percentage

**org/100mL:** Organisms per 100 millilitres

**NTU:** Nephelometric Turbidity Units

**MPN/100mL:** Most Probable Number of organisms per 100 millilitres

**Terms**

<b>Dry</b>	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
<b>LOR</b>	Limit of Reporting.
<b>SPIKE</b>	Addition of the analyte to the sample and reported as percentage recovery.
<b>RPD</b>	Relative Percent Difference between two Duplicate pieces of analysis.
<b>LCS</b>	Laboratory Control Sample - reported as percent recovery.
<b>CRM</b>	Certified Reference Material - reported as percent recovery.
<b>Method Blank</b>	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
<b>Surr - Surrogate</b>	The addition of a like compound to the analyte target and reported as percentage recovery.
<b>Duplicate</b>	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
<b>USEPA</b>	United States Environmental Protection Agency
<b>APHA</b>	American Public Health Association
<b>TCLP</b>	Toxicity Characteristic Leaching Procedure
<b>COC</b>	Chain of Custody
<b>SRA</b>	Sample Receipt Advice
<b>QSM</b>	US Department of Defense Quality Systems Manual Version 5.3
<b>CP</b>	Client Parent - QC was performed on samples pertaining to this report
<b>NCP</b>	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
<b>TEQ</b>	Toxic Equivalency Quotient

**QC - Acceptance Criteria**

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 20-130% Phenols & 50-150% PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.3 where no positive PFAS results have been reported have been reviewed and no data was affected.

WA DWER (n=10): PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

**QC Data General Comments**

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

## Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
<b>Method Blank</b>							
<b>Organochlorine Pesticides</b>							
Chlordanes - Total	mg/kg	< 0.1			0.1	Pass	
4.4'-DDD	mg/kg	< 0.05			0.05	Pass	
4.4'-DDE	mg/kg	< 0.05			0.05	Pass	
4.4'-DDT	mg/kg	< 0.05			0.05	Pass	
a-BHC	mg/kg	< 0.05			0.05	Pass	
Aldrin	mg/kg	< 0.05			0.05	Pass	
b-BHC	mg/kg	< 0.05			0.05	Pass	
d-BHC	mg/kg	< 0.05			0.05	Pass	
Dieldrin	mg/kg	< 0.05			0.05	Pass	
Endosulfan I	mg/kg	< 0.05			0.05	Pass	
Endosulfan II	mg/kg	< 0.05			0.05	Pass	
Endosulfan sulphate	mg/kg	< 0.05			0.05	Pass	
Endrin	mg/kg	< 0.05			0.05	Pass	
Endrin aldehyde	mg/kg	< 0.05			0.05	Pass	
Endrin ketone	mg/kg	< 0.05			0.05	Pass	
g-BHC (Lindane)	mg/kg	< 0.05			0.05	Pass	
Heptachlor	mg/kg	< 0.05			0.05	Pass	
Heptachlor epoxide	mg/kg	< 0.05			0.05	Pass	
Hexachlorobenzene	mg/kg	< 0.05			0.05	Pass	
Methoxychlor	mg/kg	< 0.05			0.05	Pass	
Toxaphene	mg/kg	< 1			1	Pass	
<b>Method Blank</b>							
<b>Organophosphorus Pesticides</b>							
Azinphos-methyl	mg/kg	< 0.2			0.2	Pass	
Bolstar	mg/kg	< 0.2			0.2	Pass	
Chlorfenvinphos	mg/kg	< 0.2			0.2	Pass	
Chlorpyrifos	mg/kg	< 0.2			0.2	Pass	
Chlorpyrifos-methyl	mg/kg	< 0.2			0.2	Pass	
Coumaphos	mg/kg	< 2			2	Pass	
Demeton-S	mg/kg	< 0.2			0.2	Pass	
Demeton-O	mg/kg	< 0.2			0.2	Pass	
Diazinon	mg/kg	< 0.2			0.2	Pass	
Dichlorvos	mg/kg	< 0.2			0.2	Pass	
Dimethoate	mg/kg	< 0.2			0.2	Pass	
Disulfoton	mg/kg	< 0.2			0.2	Pass	
EPN	mg/kg	< 0.2			0.2	Pass	
Ethion	mg/kg	< 0.2			0.2	Pass	
Ethoprop	mg/kg	< 0.2			0.2	Pass	
Ethyl parathion	mg/kg	< 0.2			0.2	Pass	
Fenitrothion	mg/kg	< 0.2			0.2	Pass	
Fensulfothion	mg/kg	< 0.2			0.2	Pass	
Fenthion	mg/kg	< 0.2			0.2	Pass	
Malathion	mg/kg	< 0.2			0.2	Pass	
Merphos	mg/kg	< 0.2			0.2	Pass	
Methyl parathion	mg/kg	< 0.2			0.2	Pass	
Mevinphos	mg/kg	< 0.2			0.2	Pass	
Monocrotophos	mg/kg	< 2			2	Pass	
Naled	mg/kg	< 0.2			0.2	Pass	
Omethoate	mg/kg	< 2			2	Pass	
Phorate	mg/kg	< 0.2			0.2	Pass	

Test	Units	Result 1		Acceptance Limits	Pass Limits	Qualifying Code
Pirimiphos-methyl	mg/kg	< 0.2		0.2	Pass	
Pyrazophos	mg/kg	< 0.2		0.2	Pass	
Ronnel	mg/kg	< 0.2		0.2	Pass	
Terbufos	mg/kg	< 0.2		0.2	Pass	
Tetrachlorvinphos	mg/kg	< 0.2		0.2	Pass	
Tokuthion	mg/kg	< 0.2		0.2	Pass	
Trichloronate	mg/kg	< 0.2		0.2	Pass	
<b>Method Blank</b>						
<b>Heavy Metals</b>						
Arsenic	mg/kg	< 2		2	Pass	
Cadmium	mg/kg	< 0.4		0.4	Pass	
Chromium	mg/kg	< 5		5	Pass	
Copper	mg/kg	< 5		5	Pass	
Lead	mg/kg	< 5		5	Pass	
Mercury	mg/kg	< 0.1		0.1	Pass	
Nickel	mg/kg	< 5		5	Pass	
Zinc	mg/kg	< 5		5	Pass	
<b>LCS - % Recovery</b>						
<b>Organochlorine Pesticides</b>						
Chlordanes - Total	%	82		70-130	Pass	
4.4'-DDD	%	77		70-130	Pass	
4.4'-DDE	%	86		70-130	Pass	
4.4'-DDT	%	73		70-130	Pass	
a-BHC	%	89		70-130	Pass	
Aldrin	%	92		70-130	Pass	
b-BHC	%	80		70-130	Pass	
d-BHC	%	90		70-130	Pass	
Dieldrin	%	104		70-130	Pass	
Endosulfan I	%	81		70-130	Pass	
Endosulfan II	%	90		70-130	Pass	
Endosulfan sulphate	%	83		70-130	Pass	
Endrin	%	80		70-130	Pass	
Endrin aldehyde	%	84		70-130	Pass	
Endrin ketone	%	81		70-130	Pass	
g-BHC (Lindane)	%	94		70-130	Pass	
Heptachlor	%	78		70-130	Pass	
Heptachlor epoxide	%	75		70-130	Pass	
Hexachlorobenzene	%	94		70-130	Pass	
Methoxychlor	%	75		70-130	Pass	
<b>LCS - % Recovery</b>						
<b>Organophosphorus Pesticides</b>						
Diazinon	%	79		70-130	Pass	
Dimethoate	%	83		70-130	Pass	
Ethion	%	98		70-130	Pass	
Fenitrothion	%	88		70-130	Pass	
Methyl parathion	%	92		70-130	Pass	
Mevinphos	%	92		70-130	Pass	
<b>LCS - % Recovery</b>						
<b>Heavy Metals</b>						
Arsenic	%	92		80-120	Pass	
Cadmium	%	92		80-120	Pass	
Chromium	%	114		80-120	Pass	
Copper	%	97		80-120	Pass	
Lead	%	107		80-120	Pass	



Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Mercury			%	81			75-125	Pass	
Nickel			%	92			80-120	Pass	
Zinc			%	89			80-120	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
<b>Spike - % Recovery</b>									
<b>Organochlorine Pesticides</b>				Result 1					
Chlordanes - Total	M19-JI49534	NCP	%	117			70-130	Pass	
4.4'-DDD	M19-JI49534	NCP	%	73			70-130	Pass	
4.4'-DDE	M19-JI49534	NCP	%	94			70-130	Pass	
4.4'-DDT	S19-JI37903	NCP	%	93			70-130	Pass	
a-BHC	M19-JI49534	NCP	%	112			70-130	Pass	
Aldrin	M19-JI49534	NCP	%	117			70-130	Pass	
b-BHC	M19-JI49534	NCP	%	95			70-130	Pass	
d-BHC	M19-JI49534	NCP	%	82			70-130	Pass	
Dieldrin	M19-JI49534	NCP	%	96			70-130	Pass	
Endosulfan I	M19-JI49534	NCP	%	105			70-130	Pass	
Endosulfan II	M19-JI49534	NCP	%	87			70-130	Pass	
Endosulfan sulphate	M19-JI49534	NCP	%	74			70-130	Pass	
Endrin	M19-JI49534	NCP	%	108			70-130	Pass	
Endrin aldehyde	M19-JI49534	NCP	%	105			70-130	Pass	
Endrin ketone	M19-JI49534	NCP	%	100			70-130	Pass	
g-BHC (Lindane)	M19-JI49534	NCP	%	121			70-130	Pass	
Heptachlor	M19-JI49534	NCP	%	78			70-130	Pass	
Heptachlor epoxide	M19-JI49534	NCP	%	118			70-130	Pass	
Hexachlorobenzene	M19-JI49534	NCP	%	123			70-130	Pass	
Methoxychlor	S19-JI37903	NCP	%	75			70-130	Pass	
<b>Spike - % Recovery</b>									
<b>Heavy Metals</b>				Result 1					
Arsenic	S19-JI44326	NCP	%	92			75-125	Pass	
Cadmium	S19-JI44326	NCP	%	90			75-125	Pass	
Chromium	S19-JI44326	NCP	%	97			75-125	Pass	
Copper	S19-JI44326	NCP	%	95			75-125	Pass	
Lead	S19-JI44326	NCP	%	96			75-125	Pass	
Mercury	S19-JI44326	NCP	%	88			70-130	Pass	
Nickel	S19-JI44326	NCP	%	87			75-125	Pass	
Zinc	S19-JI44326	NCP	%	73			75-125	Fail	Q08
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
<b>Duplicate</b>									
<b>Organochlorine Pesticides</b>				Result 1	Result 2	RPD			
Chlordanes - Total	M19-JI49541	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4.4'-DDD	M19-JI49541	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDE	M19-JI49541	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDT	M19-JI49541	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
a-BHC	M19-JI49541	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	M19-JI49541	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-BHC	M19-JI49541	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-BHC	M19-JI49541	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dieldrin	M19-JI49541	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan I	M19-JI49541	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan II	M19-JI49541	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	M19-JI49541	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin	M19-JI49541	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin aldehyde	M19-JI49541	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1	Result 2	RPD	Acceptance Limits	Pass Limits	Qualifying Code
<b>Duplicate</b>									
<b>Organochlorine Pesticides</b>				Result 1	Result 2	RPD			
Endrin ketone	M19-JI49541	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
g-BHC (Lindane)	M19-JI49541	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor	M19-JI49541	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor epoxide	M19-JI49541	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Hexachlorobenzene	M19-JI49541	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Methoxychlor	M19-JI49541	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
<b>Duplicate</b>									
<b>Organophosphorus Pesticides</b>				Result 1	Result 2	RPD			
Azinphos-methyl	M19-JI49533	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Bolstar	M19-JI49533	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorfenvinphos	M19-JI49533	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorpyrifos	M19-JI49533	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorpyrifos-methyl	M19-JI49533	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Coumaphos	M19-JI49533	NCP	mg/kg	< 2	< 2	<1	30%	Pass	
Demeton-S	M19-JI49533	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Demeton-O	M19-JI49533	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Diazinon	M19-JI49533	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Dichlorvos	M19-JI49533	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Dimethoate	M19-JI49533	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Disulfoton	M19-JI49533	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
EPN	M19-JI49533	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethion	M19-JI49533	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethoprop	M19-JI49533	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethyl parathion	M19-JI49533	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fenitrothion	M19-JI49533	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fensulfothion	M19-JI49533	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fenthion	M19-JI49533	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Malathion	M19-JI49533	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Merphos	M19-JI49533	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Methyl parathion	M19-JI49533	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Mevinphos	M19-JI49533	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Monocrotophos	M19-JI49533	NCP	mg/kg	< 2	< 2	<1	30%	Pass	
Naled	M19-JI49533	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Omethoate	M19-JI49533	NCP	mg/kg	< 2	< 2	<1	30%	Pass	
Phorate	M19-JI49533	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Pirimiphos-methyl	M19-JI49533	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Pyrazophos	M19-JI49533	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ronnel	M19-JI49533	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Terbufos	M19-JI49533	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Tetrachlorvinphos	M19-JI49533	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Tokuthion	M19-JI49533	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Trichloronate	M19-JI49533	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
<b>Duplicate</b>									
<b>Heavy Metals</b>				Result 1	Result 2	RPD			
Arsenic	S19-JI44326	NCP	mg/kg	6.4	6.4	1.0	30%	Pass	
Cadmium	S19-JI44326	NCP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	S19-JI44326	NCP	mg/kg	12	12	1.0	30%	Pass	
Copper	S19-JI44326	NCP	mg/kg	9.3	9.4	1.0	30%	Pass	
Lead	S19-JI44326	NCP	mg/kg	26	27	2.0	30%	Pass	
Mercury	S19-JI44326	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	S19-JI44326	NCP	mg/kg	8.8	9.0	2.0	30%	Pass	
Zinc	S19-JI44326	NCP	mg/kg	150	160	4.0	30%	Pass	

Duplicate				Result 1	Result 2	RPD			
% Moisture	S19-JI37958	NCP	%	14	14	<1	30%	Pass	

**Comments**
**Sample Integrity**

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

**Qualifier Codes/Comments**

Code	Description
Q08	The matrix spike recovery is outside of the recommended acceptance criteria. An acceptable recovery was obtained for the laboratory control sample indicating a sample matrix interference

**Authorised By**

Andrew Black	Analytical Services Manager
Emily Rosenberg	Senior Analyst-Metal (VIC)
Joseph Edouard	Senior Analyst-Organic (VIC)


**Glenn Jackson**
**General Manager**

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

\* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please [click here](#).

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# CHAIN OF CUSTODY RECORD

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 03 8584 5000 EnviroSampleVic@eurofins.com

Company <b>Whitehead &amp; Associates</b>		Project No <b>2438</b>		Project Manager <b>Strider Duerinckx</b>		Sampler(s) <b>SD, HM, MW</b>			
Address <b>Unit 2 / 13 Industrial Drive, North Boambee Valley NSW 2454</b>		Project Name <b>Newmans Rd</b>		EDD Format EStat, EQuS etc		Handed over by <b>MW</b>			
Contact Name <b>Strider Duerinckx</b>		Analysis Where results are requested, please specify "date" or "Element" SUITE code must be used to attract SUITE priority				Email for Invoice <b>mnc@whiteheadenvironmental.com.au</b>			
Phone No <b>02-66511512</b>						Email for Results <b>As above</b>			
Special Directions						Containers Change container type & size if necessary.		Required Turnaround Time Default will be 5 days if not listed.	
Purchase Order <b>2438</b>						500mL Plastic 250mL Plastic 125mL Plastic 200mL Amber Glass 40mL Vial 500mL PPAS PET Jar (Glass or HDPE)		*Surcharge will apply <input type="checkbox"/> Overnight (reporting by 9am)* <input type="checkbox"/> Same day* <input type="checkbox"/> 1 day* <input type="checkbox"/> 2 days* <input type="checkbox"/> 3 days* <input checked="" type="checkbox"/> 5 days (Standard) <input type="checkbox"/> Other	
Quote ID No						Sample Comments / Dangerous Goods Hazard Warning			
No	Client Sample ID	Sampled Date/Time <small>(dd/mm/yyyy hh:mm)</small>	Matrix <small>Solid (S) Water (W)</small>	M-8 B14					
1	S-1	25/7/19	S	-	-				
2	S-2	25/7/19	S	-	-				
3									
4									
5									
6									
7									
8									
9									
10									
Total Counts				2	2				
Method of Shipment		<input type="checkbox"/> Courier (# ) <input type="checkbox"/> Hand Delivered <input type="checkbox"/> Postal		Name <b>Mei Wong</b>		Signature <i>[Signature]</i>			
Eurofins   mgt Laboratory Use Only		Received By <b>Grace Tuckwell</b>		<input checked="" type="checkbox"/> SYD   MEL   PER   ADL   NTL   DRW <input type="checkbox"/> SYD   BNE   MEL   PER   ADL   NTL   DRW		Date <b>26/7</b> Signature <i>[Signature]</i> Date <b>25/7/19</b> Time <b>9:00</b> Temperature <b>17.53</b> Report No <b>667917</b>			

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