# Tallawarra Lands

## Tallawarra Lands Concept Plan Approval Modification

82017142-02

Prepared for
Bridgehill (Tallawarra) Pty Ltd

31 May 2018

BRIDGEHILL

Cardno
Shaping the Future

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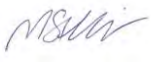

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# Document Information

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# Executive Summary

The Tallawarra Lands Concept Plan Approval (Concept Plan) (MP09_0131) was approved on 23 May 2013 for a mixed use development including residential, commercial, industrial, retail and public open space, along with conservation areas. The approval provides the overarching requirements for the future residential development of the land. Since this approval was granted the need for housing within the Illawarra has increased and the type of housing stock required has shifted as the demographics of the area changed.

The site is identified as a key greenfield Urban Release Area within the Illawarra-Shoalhaven Regional Plan (DP&E, 2014), with the site earmarked for approximately 1,000 housing lots. Energy Australia, the current owners of the site have entered into an agreement with BridgeHill (Tallawarra) Pty Ltd (Bridgehill) for the ultimate development of two of the three Precincts indicated within the Concept Plan for the site. The Lakeside Precinct is proposed to be retained within Energy Australia ownership whilst contamination issues associated with the previous Tallawarra Coal Fired Power Station are completed. As such, the lots associated with this precinct are not expected to be developed in the foreseeable future.

In addition to the reduction of developable land with the Tallawarra Lands site, there has been a significant increase in the demand for housing lots throughout the Illawarra. This increased demand is especially strong for small lot sizes that support townhouse and attached dwelling housing types. The site is well located for higher density development, due to the proximity to open space, services and the Region's major centres, Wollongong and Shellharbour.

The proposed modification seeks to increase the density of development within the northern half of the site, achieved through amendments to the zoning boundaries and minimum lot sizes. The increased densities and development extents will help meet the increase in demand and the changing demographic requirements. The modification also seeks to amend a number of conditions of the original Concept Plan approval to acknowledge changes that have occurred over the four years since the approval was granted. These changes primarily comprise the separation of the North Shore and Central precincts from the Lakeside Precinct and the associated requirements of the first development application as identified within the Concept Approval.

The Tallawarra Lands is a Transitional Part 3A project, and the modification provisions under section 75W (now repealed) of the EP&A Act continue to apply. A review of the legal precedent for section 75W modifications has been undertaken, which illustrates that the scale of modification is within the bounds of section 75W.

Comprehensive assessment of the potential environmental impacts associated with the project has been undertaken. The assessments have reviewed the existing studies that informed the Concept Approval in consideration of the existing land use and legislative context. The studies have then considered the potential for additional impacts resulting from the modification and, where required, how these impacts can be offset. A summary of the findings of the key studies is below.

> **Traffic assessment** – Considered the impacts of the revised development yield, previous land use assumptions and proposed changes to access arrangements. Previous traffic models were updated to reflect these changes and found that the revised development yield did not result in critical network operational concerns when compared with the approved concept yield.

> **Acoustic assessment** – Considered the industrial, transport and urban noise affectation, finding that the noise impacts resulting from the development will be no greater than noise impacts on the previously approved lots. Therefore, no land use planning issues from cumulative industrial operations are expected for the North Shore or Central precincts.

> **Ecological assessment** – Considered direct and indirect impacts resulting from the proposed modification. Direct impacts to the ecological values are limited, as the majority of the development is associated with cleared land, with only a further 4.2% of the development site being cleared as a result.

  Indirect impacts from the proposed development may include noise and/or erosion associated with the construction phase of the project. These impacts will be managed through the development of a CEMP and a landscape scheme using native species to help reintroduce vegetation in areas of the site currently comprising cleared grass, improving biodiversity and visual amenity, with associated environmental sustainability benefits.

- **Bushfire Assessment** – Considered the proposed modification against the provisions within *Planning for Bush fire Protection 2006* (PBP) to ensure compliance can be achieved. These provisions require Asset Protection Zones and Access to be provided. These measures have been incorporated into the proposed modification layout to ensure compliance with PBP.
- **Geotechnical Assessment** – Considered the potential for stability issues through desk top and intrusive investigations. The assessment found that the expanded Central Precinct poses moderate geotechnical risks, with the North Shore Precinct having low risk. The potential risks can be managed by appropriate engineering design, which would be determined through future intrusive investigation and assessment prior to works commencing.
- **Contamination investigation** – Comprised desk top and intrusive investigations. The assessment identified that there are currently no Contaminants of Potential Concern (COPC) present in the Central and North Shore Precinct modification areas at concentrations above the Tier I human health screening values.

  Copper is present at the site at concentrations above the Tier I ecological screening values. However, ecological receptors of significance were not identified at or within close proximity to the modification areas. The overall potential risk to the local environment based on the measured copper concentrations is considered low. A Site Auditor has been engaged to review the investigations undertaken, providing a further level of rigour to the assessment.
- **Visual Impact Assessment** – Was undertaken using the methodology employed for the Concept Approval. The assessment found that while the development would result in additional urban development being visible from viewing points beyond the site, the potential impact is limited and partially offset through the relocation of powerlines underground and removal of associated stanchion's.

  The proposed changes are assessed and clearly illustrated through a photographic survey and the production of artist's impressions to determine the overall impact of the changes. The modifications are characterised by the backdrop of the Escarpment, which forms the dominant feature and minimises sky lining, which in conjunction with controls to cap building height and to carry out ridgeline tree planting will limit visual impact.

The environmental assessments undertaken and detailed within this report illustrate that the proposed modification subject to the identified mitigation and management measures will not create a significant environmental impact beyond that approved by the Concept Plan. The modification would contribute to meeting the residential and employment needs of the Illawarra consistent with State and local strategic planning documentation. Consequently, the modification provides a contemporary approach to realising the potential of the site, while addressing the potential for impact and is considered worthy of support.

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# Glossary of Terms

The table below provides a glossary of key terms and acronyms used within this document

| Term or Acronym | Definition |
|---|---|
| AHIP | Aboriginal Heritage Impact Permit |
| AHIMS | Aboriginal Heritage Information Management System |
| APRB | Albion Park Rail Bypass |
| APZs | Asset Protection Zones |
| ASS | Acid Sulphate Soil |
| BAR | Biodiversity Assessment Report |
| BGL | Below Ground Level |
| Bridgehill | Bridgehill (Tallawarra) Pty Ltd |
| CCGT | Combined Cycle Gas Turbine |
| CEEC | Critically Endangered Ecological Community |
| CEMP | Construction Environmental Management Plan |
| CLM Act | Contaminated Land Management Act 1997 |
| Concept Plan | Tallawarra Lands Concept Plan Approval (MP09_0131) |
| Council | Wollongong City Council |
| CPTED | Crime Prevention through Environmental Design |
| Cardno | Cardno NSW/ACT Pty Ltd |
| DA | Development Application |
| DCP | Development Control Plan |
| DoE | Department of Environment |
| DP&E | Department of Planning and Environment |
| DPI Fisheries | NSW Department of Primary Industries – Fisheries |
| DPI Water | NSW Department of Primary Industries – Water |
| EEC | Endangered Ecological Communities |
| EIS | Environmental Impact Statement |
| EP&A Act | *Environmental Planning and Assessment Act 1979* |
| EP&A Regulation | *Environmental Planning and Assessment Regulation 2000* |
| EPA | Environment Protection Authority (NSW) |
| EPBC Act | *Environmental Protection and Biodiversity Conservation Act 1999* |
| EPL | Environment Protection Licence |
| FM Act | *Fisheries Management Act 1994* (FM Act) |
| FSR | Floor Space Ratio |
| Heritage Act | *Heritage Act 1977* |
| HIA | Heritage Impact Assessment |
| ICNG | Interim Construction Noise Guideline |
| IRS | Illawarra Regional Strategy |
| LEP | Local Environmental Plan |
| LGA | Local Government Area |
| Minister | Minister for Planning |
| NES | National Environmental Significance |

| Term or Acronym | Definition |
|---|---|
| NW Act | *Noxious Weed Act 1993* |
| NP&W Act | *National Parks and Wildlife Act 1974* |
| NSW | New South Wales |
| OEH | Office of Environment and Heritage |
| PAD | Potential Archaeological Deposit |
| Pb | Lead |
| POEO Act | *Protection of the Environment Operations Act 1997* |
| PEA | Preliminary Environmental Assessment |
| PERA | Preliminary Environmental Risk Analysis |
| RAP | Remedial Action Plan |
| RL | Relative Level |
| RMS | Road and Maritime Services |
| Roads Act | *Roads Act 1993* |
| SEARs | Secretaries Environmental Assessment Requirements |
| SEP | Stakeholder Engagement Plan |
| SEPP | State Environmental Planning Policies |
| SoC | Statement of Commitments |
| TEC | Threatened Ecological Communities |
| TSC Act | *Threatened Species Conservation Act* |
| VPA | Voluntary Planning Agreement |
| WM Act | *Water Management Act 2000* (WM Act) |
| WLEP | Wollongong Local Environmental Plan 2009 |
| WSUD | Water Sensitive Urban Design |

# 1 Introduction

This section introduces the proposed Concept Plan Modification, providing background to the project, requirements to be addressed and consultation undertaken.

## 1.1 Overview of Proposal

The Tallawarra Lands Concept Plan Approval (Concept Plan) (MP09_0131) provides the overarching requirements for the future residential development that will occur within the Tallawarra Lands. The site underwent rezoning when the Standard Instrument Local Environmental Plan was introduced to Wollongong in 2009. The rezoning utilised the now surplus environmental buffer zone that existed around the former coal fired power station to aid in the fulfilment of housing and employment needs in the Illawarra.

Approval for the Concept Plan was granted on 23 May 2013 for a mixed use development including residential, commercial, industrial and retail development, public open space areas, new recreational facilities, environmental management, conservation areas and riparian corridors. Since this approval was granted the need for housing within the Illawarra has increased and the type of housing stock required has shifted as the demographics of the area changed.

The proposed modification seeks to increase the density of development within the northern and central portion of the site by amending zone boundaries and minimum lot sizes to meet this increase in demand and the changing demographic requirements. The modification also seeks to amend a number of conditions of the original Concept Plan approval to acknowledge changes that have occurred over the 4 years since the approval was granted. These changes primarily comprise the separation of the North Shore and Central precincts from the Southern precinct, which is being held by the existing landowner Energy Australia, and the associated requirements of the Concept Plan for the 'first development application'.

## 1.2 Background

Bridgehill (Tallawarra) Pty Ltd (Bridgehill) has entered into a purchase agreement with Energy Australia over the North Shore and Central precincts of the Tallawarra Lands. Bridgehill has engaged Cardno (NSW/ACT) Pty Ltd (Cardno) to prepare a Modification to the Concept Plan approval to facilitate the development of the Lands.

### 1.2.1 Tallawarra Lands Urban Release Area

The Tallawarra Lands is an Urban Release Area (URA) identified within the Illawarra-Shoalhaven Regional Plan (ISRP) (DP&E 2014). The ISRP identifies Tallawarra as a significant URA within the Illawarra that will help provide for the forecast housing demand over the next 25 years. The ISRP lists the Tallawarra Lands as a key component in meeting the housing requirements throughout the Region. The Plan states that the site has been rezoned with the potential to house 1,000 lots.

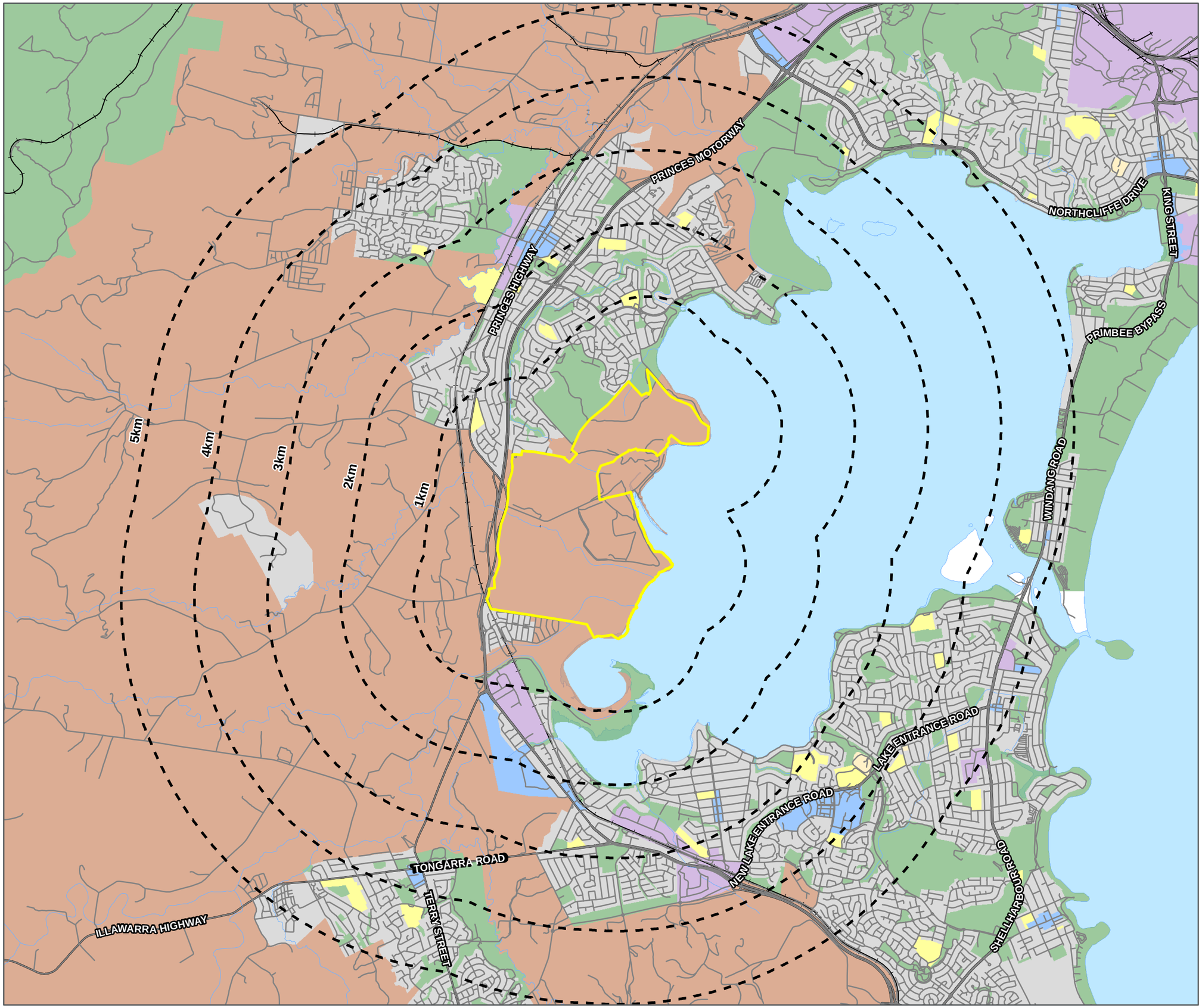
The site is located centrally within the wider Wollongong/Shellharbour region. The site is positioned on the western side of Lake Illawarra and is surrounded by the suburbs of Koonawarra, Dapto, Yallah and Haywards Bay. Whilst the site falls entirely within the Wollongong LGA, the site is within close proximity to Shellharbour. Shellharbour Town Centre is located to the south of the site at a distance of 13.5km, with Wollongong 20km to the north. The central location of site between the two major centres within the Region make it well placed to provide residential housing options for the area. In addition to this central location, the site is located adjacent to the Princes Motorway providing ease of access to both locations, as well as the wider Region, with Sydney located 100km to the north.

The site is also in close proximity to a number of employment areas. In addition to the two major centres of Wollongong and Shellharbour, the site is located proximate to the industrial areas of Port Kembla and Unanderra to the north, as well as employment locations within Albion Park Rail to the south. Dapto is the closest service centre to the site, located at a distance of 7km to the west. Whilst the site will include its own commercial land uses, it is expected that Dapto will remain the predominate location for future residents of the site to access their weekly needs.

The topography of the site is varied, with steep slopes on the southern side of Mount Brown providing the north western boundary of the site, more moderate slopes to the east, through to gentle slopes within the vicinity of the Lake. This topography, in conjunction with the location of the site adjacent to Lake Illawarra, results in a location that offers fantastic views both out over Lake Illawarra to the east and towards the Escarpment to the south.

These factors all combine to create a location that is highly suited to residential development. In comparison to other URAs throughout the area, the greater amenity that this site has leans itself towards higher density residential development. The proposed modifications addressed within this Environmental Assessment aim to provide a greater mix of residential typologies to that proposed within the initial Concept Plan to provide greater housing supply. Whilst densities within the site will be increased slightly, the Environmental Assessments undertaken (detailed below) have demonstrated that there will be no adverse impacts from these changes to those detailed within the initial Concept Approval for the Tallawarra Lands.

**Figure 1-1** below details the location of the Tallawarra Lands site in relation to both Wollongong and Shellharbour. **Figure 1-2** details the proposed modified layout of the Central and North Shore Precincts of the site.

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# Locality Plan

TALLAWARRA LANDS

## Legend

- Concept Plan Boundary
- Railway (LPI)
- Distance Buffer
- Local Roads (LPI)
- Major Roads (LPI)
- Major Watercourses (LPI)

**Land Use (ABS, 2011)**

- Other
- Commercial
- Education
- Hospital/Medical
- Industrial
- Parkland
- Residential

**FIGURE 1-1**

**1:50,000 Scale at A3**

Metres

0 500 1,000 1,500 2,000

N

Cardno

Map Produced by Cardno NSW/ACT Pty Ltd (WOL)
Date: 2017-10-25 | Project: 8201714201
Coordinate System: GDA 1994 MGA Zone 56
Map: 82017142-01-GS-026-Locality_Plan.mxd 03


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# Site Plan

TALLAWARRA LANDS

## Legend

- Concept Plan Boundary
- Lot Layout
- Watercourses (LPI)
- Cadastre (DFSI-SS, 2017)
- Concept Approval Boundary
- Modification Boundary

FIGURE 1-2

1:15,000 Scale at A3

Metres

0 200 400 600 800

N

Cardno

Map Produced by Cardno NSW/ACT Pty Ltd (WOL)
Date: 2017-10-25 | Project: 8201714201
Coordinate System: GDA 1994 MGA Zone 56
Map: 82017142-01-GS-025-Site_Plan.mxd 03
Aerial imagery supplied by nearmap (October, 2016)

### 1.2.2 Tallawarra Lands Concept Plan

The Concept Plan approval (MP09_0131) was granted for the Tallawarra Lands on 23 May 2013. This approval was granted on the land owned by Energy Australia Tallawarra Pty Ltd for a mixed use development comprised of the following;

> Three residential precincts being North Shore, Central and Lakeside; comprising a total of 1,010 lots

> A retirement village containing 200 dwellings and a primary school

> A neighbourhood centre

> 12 ha of land zoned B6 Enterprise corridor

> 54 ha of industrial and light industrial land

> 2.5 ha site for use as a tourist facility

> Road network, foreshore open space, walkways, cycle paths and share paths

> 360 ha of open space

Specifically, the three precincts are described below and the approved Concept Plan is contained at **Figure 1-3.**

**Figure 1-3 Tallawarra Lands Concept Plan**


Source: Tallawarra Lands Masterplan (2013)

#### *1.2.2.2 North Shore Precinct*

The North Shore Precinct is located to the south of the suburbs of Kanahooka and Koonwarra, and north of the Tallawarra Power Station. The site has frontage to Lake Illawarra and is positioned on the eastern slopes of Mount Brown providing views to the north and east across the lake. The site is 110ha in size and has an approved residential yield of 310 lots. These residential lots will be positioned within the middle section of the site, with foreshore land set aside for public open space to the east and the conservation of existing vegetation on Mount Brown managed through Environmental Management lands on the upper slopes to the west.

This precinct will be connected to Kanahooka through the extension of the existing Gilba Road, which connects through to Fowlers Road and to the Princes Motorway.

**Figure 1-4 North Shore Precinct Concept Plan**


Source: Tallawarra Lands Masterplan (Warren Lee Urban Design, 2011)

#### *1.2.2.3 Central Precinct*

The Central Precinct is located to the south of the residential development of Dapto and to the east of the Princes Motorway. It is positioned on the southern slopes of Mount Brown and provides an outlook to the south with views towards Albion Park and Shellharbour. The precinct is 210 ha in size and is proposed to house 340 standard residential lots, with a further 10 large lots. Additionally, the precinct will house a neighbourhood centre, which will incorporate a small supermarket, speciality shops, medical centre and child-care centre. Industrial and light industrial land will be included towards the Tallawarra Power Station along the northern side of Yallah Bay Road.

The area is accessed by Yallah Bay Road, which provides connection through to the Tallawarra Power Station. Yallah Bay Road connects to the Princes Highway, which provides connection to Dapto in the north and Albion Park Rail in the south.

The Central Precinct also included areas south of Yallah Bay road and north of Duck Creek, which are proposed for the development of a 2.5 ha tourism site on the headland at the eastern portion of the site, further industrial land and open space inclusive of sports fields. **Figure 1-5** below details the approved Concept Plan for the Central precinct.

Note, the areas of the Central Precinct, with the exception of the tourism site, that are located to the south of Yallah Bay Road are not the subject of this modification. Consequently, these areas have not been addressed further in this report

**Figure 1-5 Central Precinct Concept Plan**


Source: Tallawarra Lands Masterplan (2013)

### *1.2.2.4 Lakeside Precinct*

The Lakeside Precinct is located to the south of Duck Creek, north of the new residential subdivision located at Haywards Bay. The site is proposed to be accessed from the north from Yallah Bay Road and is the location of the historic coal storage areas associated with the now demolished Coal Fired Tallawarra Power Station. The site is generally flat and is surrounded by riparian corridors, wetlands and estuaries associated with Lake Illawarra.

The Precinct is proposed to contain 350 residential lots to the south of the area, with a 200 dwelling retirement village and primary school also included. The precinct will also contain a significant area of commercial zoned land for business/office and bulky goods uses.

**Figure 1-6 Lakeside Precinct Concept Plan**


Source: Tallawarra Lands Masterplan (2013)

### 1.2.3 Tallawarra Power Station

The Tallawarra lands have been utilised for power generation since 1954, initially through the establishment of a coal fired power station on the site through to the gas fired power station that currently exists. This use will continue for the foreseeable future with plans to expand the current power station in place.

#### *1.2.3.1 Tallawarra Coal Fired power Station*

The initial power station that existed on site was a coal fired power station that was constructed in 1954 and operated through to 1989 when it was decommissioned. The site was then extensively remediated with the former plant and the majority of ancillary buildings demolished. The operation of the power station required extensive buffer lands, which are still evident today through the surrounding open space and grazing land.

#### *1.2.3.2 Tallawarra A*

In 1998, Pacific Power lodged an Environmental Impact Statement with Wollongong City Council (Council) to support a Development Application to construct a Combined Cycle Gas Turbine (CCGT) Power Station on the site, with approval granted in 1999. In 2003 the site was purchased by TRU energy Tallawarra (now Energy Australia).

The construction of a CCGT Power Plant commenced in November 2006 and was opened in 2009. The power plant is a 435-megawatt power station with the capacity to supply 200,000 homes, producing around 70% less greenhouse gas emissions than a traditional coal fired power station.

#### *1.2.3.3 Tallawarra B*

The existing Tallawarra A power plant is expected to be expanded with the installation of Tallawarra B. This power plant will be installed adjacent to the existing power plant and will utilise the existing infrastructure on site. It is indicated that stage B will be of a similar scale to stage A, ensuring a continued and secure supply of energy to the NSW energy market. The Tallawarra B Power Station received project approval from the

Department of Planning on 21 December 2010, with a further Modification made to this approval to extend the lapse date of the initial approval granted extending the approval until 21 December 2020.

### 1.2.4 Zoning History

Following the demolition of the original Coal Fired Power Station and the construction of the CCGT on the Tallawarra site it was identified that there was scope to utilise the surplus land not required for the reduced buffer zones around the power station for other land uses. In 2006, Council engaged Wilana Associates to prepare a Local Environmental Study for the site which was used by Council to inform the subsequent zoning controls. This information provided the background studies required to lead into the drafting of a Local Environmental Plan (LEP) for the site, which was subsequently incorporated into the wider Wollongong LEP which was being prepared within the Standard Instrument. The zoning controls for the site were published within the Wollongong LEP 2009 (WLEP) on 26 February 2010.

### 1.2.5 Tallawarra Lands Concept Plan Modifications

There have been two modifications raised against the Tallawarra Lands Concept Plan. These modifications have been initiated by Bridgehill who have entered into an agreement with Energy Australia for the site and are described below.

#### *1.2.5.1 Modification 1*

A request for Secretary's Environmental Assessment Requirements (SEARs) to inform Modification 1 was submitted with the Department of Planning and Environment (DP&E) on the 8th November 2016.

This modification is detailed below in **Section 3**. In summary, it seeks to increase the footprint of residential development in the Central and North Shore Precincts and to increase the overall approved residential yield from 1,010 to 1,480 lots, along with decoupling the North Shore and Central precincts from the Lakeside Precinct, as it is not available to Bridgehill.

The SEARs for the modification were issued on the 23 January 2017. The SEARs are detailed at **Appendix A**.

#### *1.2.5.2 Modification 2*

Modification 2 was submitted to the DP&E on the 15th May 2017. This modification sought an extension to the Lapse date of the Concept Approval.

Schedule 2 within the Concept Approval within Part A – Terms of Approval includes a condition that details the lapse date for the Concept Approval. Condition A4 requires;

> *A4 – Lapsing of Approval*
>
> *Approval of the Concept Plan shall lapse 5 years after the determination date shown on this Instrument of Approval, unless a Development Application is submitted to Council for approval to carry out all or part of the project the subject of this Concept Plan Approval.*

The determination date for the Concept Approval is the 23rd May 2013, meaning that the approval would be due to lapse on the 23rd May 2018. Dentons Australia, on behalf of Bridgehill, applied to modify the lapse date of the approval by extending the date by 3 years. This modification was approved on the 1st August 2017, extending the lapse date of the Concept Approval through to the 23rd May 2021.

### 1.2.6 Illawarra Context

The following sections discuss the demographic trends and development context of relevance to the Tallawarra Lands.

Following the release of 2016 census data some trends of note have been highlighted in the changing nature of residential house hold structure within the Wollongong City statistical division. Over the period of time between the 2011 and 2016 censuses there has been an increase of 3,637 dwellings (80,276 to 83,913). Of this increase in dwellings, 806 (22.2% of the increase) are listed as a separate house, 1,158 (31.8% of the increase) medium density and 1,392 (38.3% of the increase) high density (Profile.id, 2017a). This proportion of dwelling type construction has seen a marked change in the overall spread of housing types within Wollongong Statistical Area. Separate houses have reduced from 69.4% of the dwelling stock to 67.3%,

medium density houses have increased from 20.2% to 20.7% and high density has increased from 9.0% to 10.3%. These figures point to a distinct shift in the dwelling type desired throughout the Illawarra (profile.id, 2017a).

In comparison, The Shellharbour City Statistical division LGA experienced a growth of 1,955 houses, approximately half of which related to separate houses (951 or 48.6%). Medium density houses increased by 941 (48.1%) and high-density houses fell by 108 (a fall of 0.4%), with the remainder of the increase attributed to no response within the 2016 census data. These changes have resulted in a fall in the comparative make-up of the Shellharbour City area for separate houses from 81.4% to 79.0%, with a subsequent increase in the proportion of medium density housing (16.5% to 18.8%) (profile.id, 2017b).

These figures point to the significant amount of apartment buildings that have been constructed within the Wollongong City Centre, as well as surrounding centres, since the 2011 census. Further in-fill development is also evident within the established areas surrounding the City in the form of townhouse style developments. This shift in housing development points to a desire for housing in close proximity to key services and employment opportunities that are not as accessible in the large green field development areas. The Tallawarra lands are in a highly accessible location. The site is surrounded by existing residential suburbs of Kanahooka, Koonawarra, Dapto and Haywards Bay providing a mix of services needed on a day-to-day basis. Additionally, the site is located adjacent to the Princes Motorway providing a rapid commute to either Wollongong or Shellharbour; or south western Sydney via Picton Road and the Hume Highway. As such, the Tallawarra Lands site can be closely related to an in-fill style development and more suited to providing higher density living options than found in either West Dapto or Calderwood (both discussed below). The proposed modification would help the development within the Tallawarra Lands align with the market demand for a range of smaller lot sizes, located in close proximity to areas of high amenity, transport and employment.

#### *1.2.6.1 Developments in Proximity to the Site*

The following large developments are either proposed or currently occurring within proximity to the site, which have potential to impact on the proposed development directly and indirectly.

##### 1.2.6.1.1 Albion Park Rail Bypass

The development of the Albion Park Rail bypass is currently undergoing assessment with DP&E to see the Princes Highway upgraded within the vicinity of Albion Park Rail. This section of the highway is the last remaining section of the M1 Motorway to be upgraded as it passes through Wollongong and Shellharbour.

The proposed upgrade works are planned to commence adjacent to the northern boundary of the Tallawarra Lands site and upon its completion it will provide improved connections to Shellharbour in the south and some benefits for car travel through to Wollongong in the north. The Environmental Assessment that has been released for this project includes a major intersection upgrade of the Princes Highway/Princes Motorway adjacent to Yallah Bay Road. This interchange has been proposed to provide on/off ramps for both north and south bound travel.

Since the release of this Environmental Assessment there has been indications that this interchange may be removed from the design. The Traffic Impact Assessment (TIA) (Cardno, 2017e) undertaken to support this modification modelled the impact that the increased residential component would have on the surrounding road network. Whilst it found that there would be no impacts, it did highlight the benefits that the addition of the northern interchange would have on the wider road network. The exclusion of the northern interchange would lessen the beneficial impacts of this project on the Tallawarra Lands. There is still expected to be travel improvements through to Shellharbour in the south as the bottleneck of Albion Park Rail is removed from these trips.

The inclusion or exclusion of this interchange will influence some of the anticipated environmental impacts on the Central Precinct. The Concept Approval included provision for this interchange in the studies conducted, with this modification continuing this approach.

##### 1.2.6.1.2 Calderwood

Calderwood Valley URA is located to the south-west of the Tallawarra Lands. This URA extends from the Illawarra Highway to the west of Albion Park in the Shellharbour Local Government Area (LGA) through to

Marshall Mount within the Wollongong LGA. When complete, the subdivision will house a further 4,800 dwellings and will incorporate a town centre with schools and extensive open space. This URA will eventually join up with the southern extent of the West Dapto URA described below.

At present Stage 1 of the development has been released to the public with Stage 2 under various stages of construction. Approximately 500 of the proposed lots have been sold, with lots being highly sought after. The sales process has been highly competitive with a ballot system used. Generally, lots are selling within days of being released to the market. The demand for these lots is high, with land being in premium supply throughout the Illawarra.

The development has offered a varied range of housing lot types, with lot sizes down to 300m$^2$. These small lots have proven highly popular, both in regards to affordability of the land and meeting current lifestyle choices.

The Tallawarra Lands have distinct advantages over Calderwood Valley due to the proximity to the Wollongong/Shellharbour urban footprint, with reduced travel times and improved service accessibility. The proposed amendments discussed in the Modification to the approved Concept Plan for the Tallawarra Lands aims to better position the site to take full advantage of its positon and the need within the Illawarra for a more diverse housing stock within a higher density environment.

#### 1.2.6.1.3 West Dapto

The development of the West Dapto URA is the major greenfield development within the Illawarra. Over the life of the URA approximately 19,000 residential lots will be released to the market with all of the associated infrastructure needed for a development of this size. This will include eight new town and village centres as well as 2,668ha of open space (WCC, 2009). West Dapto will be developed through five stages of works to enable supporting infrastructure to be progressively rolled out. Presently, Stages 1 and 2 have been rezoned for development with a number of subdivisions developed or in the process of being constructed.

To this point in time, there have been significant issues related to the development of the area due to the provision of required infrastructure. The area is predominately flat and has extensive flooding constraints imposed across the area. This has placed a high demand on service provision resulting in large upfront development contributions that have made it difficult to fund. This has been further exacerbated by limits imposed by the State government on the amount of contribution that Council can levy on development, further limiting Council's ability to construct the required infrastructure to enable further development. This has slowed development of the area, reducing lots to market.

As discussed above in regards to Calderwood, the lots that have been made available for sale have generally been quickly purchased with demand higher than supply. This has seen developments reduce lot sizes across the area to meet this demand and respond to affordability pressures that are becoming more evident throughout the area.

Tallawarra is seen as providing both better access than these two URAs, being in closer proximity to both the centres of Wollongong and Shellharbour. The location of the site also provides greater connectivity to the wider road network being located adjacent to the Princes Motorway whilst also surrounding the existing residential areas. The high demand for housing lots and the trend towards small building lots further adds weight to the benefits that will come from increasing the residential allotments proposed under these modifications.

## 1.3 Secretary's Environmental Assessment Requirements

On 8 November 2016, Urbis Pty Ltd on behalf of Bridgehill submitted to the DP&E a request for SEARs for the modification to the approved Concept Plan for the Tallawarra Lands (MP09_0131). This request was lodged pursuant to Section 75W of the EP&A Act to inform the preparation of an Environmental Assessment in support of the modification.

The SEARs, issued on 23 January 2017, are attached at **Appendix A**.

**Appendix B** details how this EA has addressed each of the SEARs.

## 1.4 Consultation

A Stakeholder Engagement Plan (SMP) (Cardno, 2017f) has been prepared to guide engagement during the course of the project. The SMP has identified key stakeholders and methods of engagement to ensure that meaningful engagement and input into the modification is received. The SMP builds on the requirements for consultation identified in the SEARs to identify additional parties for engagement. The SMP is contained at **Appendix C**.

The SEAR's require consultation with the following agencies:

> Wollongong City Council

> Shellharbour City Council

> Office of Environment and Heritage

> Environment Protection Authority

> Department of Industry - Lands

> NSW Office of Water

> Transport for NSW

> Roads and Maritime Services

> Rural Fire Service

> Lake Illawarra Estuary Management Committee

> NSW Department of Education and Communities

> Civil Aviation Safety Authority

> Air Services Australia

> Illawarra Regional Airport

> Australian Department of the Environment and Energy.

Consultation with the other stakeholders noted below is proposed. This is not an exhaustive list, it may change as the project progresses, with certain stakeholders becoming more or less relevant to the project.

> Local Residents

> Energy Australia Community Liaison Group

> Department of Planning and Environment – Illawarra Office

> Industry Groups

> State Politicians

> Local Councillors.

At the time of lodgement, the following engagement had taken place.

Letters requesting feedback and offering to meet had been issued to the following parties:

> Wollongong City Council

> Shellharbour City Council

> Office of Environment and Heritage (OEH)

> Environment Protection Authority

> Department of Industry – Lands

> NSW Office of Water

> Transport for NSW

- Roads and Maritime Services
- Rural Fire Service
- Lake Illawarra Estuary Management Committee
- NSW Department of Education and Communities
- Civil Aviation Safety Authority
- Air Services Australia
- Illawarra Regional Airport
- Australian Department of the Environment and Energy
- Energy Australia

Meetings had been held with:

- Wollongong City Council's executive team
- Shellharbour City Council's executive team
- Gareth Ward – Member for Kiama and Secretary for the Illawarra

**Table 1-1** below identifies the consultation undertaken to date and the key points considered.

**Table 1-1 Consultation Undertaken**

| Agency | Form of Consultation | Key Issues Raised | Response |
|---|---|---|---|
| Wollongong City Council | A letter was sent to Council on 27 July 2017 providing information on the modification and requesting a meeting to discuss the proposal. A subsequent meeting was held. | Council provided in principle support for the development without the detail being discussed. | Further discussion will be held with Council during the course of the modification assessment process. |
| Shellharbour City Council | A letter was sent to Council on 27 July 2017 providing information on the modification and requesting a meeting to discuss the proposal. A subsequent meeting was held. | Council provided in principle support for the development without the detail being discussed. | Further discussion will be held with Council during the course of the modification assessment process. |
| Office of Environment and Heritage | A letter was sent to OEH on 27 July 2017 providing information on the modification and requesting a meeting to discuss the proposal. | A meeting was held with OEH and the following points were raised:<br><br>Ecological Assessments lodged or substantially commenced prior to 25/8/17 have a 12-month grace period in which the methodology and Biobanking requirements under the existing legislation would remain valid. This means that we can use the existing legislated methodology for the modification, but would be required to undertake assessments and offset in accordance with the Biodiversity Act for the subsequent DA's. | The information provided by OEH has informed this application. |

| Agency | Form of Consultation | Key Issues Raised | Response |
|---|---|---|---|
| | | OEH noted that they do not require the following to be prepared as indicated in the SEARs:<br>> An environmental management strategy (EMS)<br>> Groundwater monitoring or assessment<br>> Wetlands consideration<br>Aboriginal Heritage excavation is preferred as early as possible in the process – preferably pre DA.<br>Larger scale investigation areas are preferred rather than small DA specific areas as this provides more flexibility for potential conservation items.<br>The tourism precinct to the south was identified as having potential Aboriginal significance.<br>European heritage is not considered to be an issue. | |
| Environment Protection Authority | A letter was sent to the EPA on 27 July 2017 providing information on the modification and requesting a meeting to discuss the proposal. | A response was received from the EPA on 02 August 2017. The EPA has no further comments and did not wish to arrange a meeting. | N/A |
| Roads and Maritime Services | A letter was sent to the RMS on 27 July 2017 providing information on the modification and requesting a meeting to discuss the proposal. | A letter was received from RMS on 14th September 2017 with the following comments:<br>RMS is currently planning for the upgrade of the Princes Highway in the vicinity of the subject site. Following submissions, RMS has updated the design which will partially impact the proposed Central Precinct. As such, RMS seeks an amendment to the proposal through the repositioning of proposed lots so they are wholly located outside the future road reserve boundary.<br>Details on how connectivity to/from Haywards Bay will be provided for vehicles, pedestrians and cyclists with the proposed separation of the Southern Precinct must be addressed | **Section 3** of this document describes the proposed number of lots within each precinct.<br>A Traffic Impact Assessment has been provided for the proposed modification at **Appendix D**.<br>The lot and road layouts have been adjusted to meet the requirements detailed in the RMS letter.<br>Attachment A of the Consultation Strategy provided at **Appendix C** shows the revised lot and road layout. It is noted that not all plans have been updated at this stage, however what is shown in the Attachment will accommodate RMS's request and will be fine-tuned further along in the process. |

| Agency | Form of Consultation | Key Issues Raised | Response |
|---|---|---|---|
| | | and provided for in any amended design.<br>A clear summary/comparative assessment is required to be submitted with any modification that details the proposed number of lots in each precinct, both as part of the issued concept approval and as part of the modification. Consideration will also need to be given to increased traffic generation and impacts this will have on the existing classified road network and proposed Albion Park Rail bypass.<br>Confirmation that satisfactory arrangements are in place under Clause 6.1 of the LEP relating to the provision of state infrastructure. | |
| Department of Industry – Lands | A letter was sent to DPI on 27 July 2017 providing information on the modification and requesting written feedback on the proposal. | A response was received from the Department of Industry - Lands on 17th August 2017. The response raised the following concern regarding the use of Crown land to provide public open space for private development:<br>Offset requirements for recreation and conservation lands cannot be placed onto adjacent Crown land, and the Department will not manage these lands to support private development. | Recreation and conservation lands will be retained. Areas of development are of limited environmental value as a result of historic agricultural practices. Consequently, offsets will not be required. |
| NSW Office of Water | A letter was sent to NSW OoW on 27 July 2017 providing information on the modification and requesting written feedback on the proposal. | No response received. | N/A |
| Transport for NSW | A letter was sent to TFN on 27 July 2017 providing information on the modification and requesting written feedback on the proposal. | No response received. | N/A |
| Rural Fire Service | A letter was sent to RFS on 27 July 2017 providing information on the modification and requesting written feedback on the proposal. | No response received. | N/A |
| Lake Illawarra Estuary Management Committee | A letter was sent to LIEMC on 27 July 2017 providing information on the modification and requesting | An email was received from the LIEMC on the 10 August 2017. Given the short time frame for a | The application will be referred to agencies once lodged with the Department. Recreation and conservation lands will be |

| Agency | Form of Consultation | Key Issues Raised | Response |
|---|---|---|---|
| | written feedback on the proposal. | response the LIEMC is not in a position to provide comprehensive feedback. However, concern was raised over the proposed superlot boundary now encompassing land zoned as E3 and a significant piece of RE1. | retained. Areas of E3 land proposed to be developed are of limited environmental value as a result of historic agricultural practices. Consequently, offsets will not be required. |
| NSW Department of Education and Communities | A letter was sent to NSW DoEC on 27 July 2017 providing information on the modification and requesting written feedback on the proposal. | No response received. | N/A |
| Civil Aviation Safety Authority | A letter was sent to CASA on 27 July 2017 providing information on the modification and requesting written feedback on the proposal. | No response received. | N/A |
| Air Services Australia | A letter was sent to ASA on 27 July 2017 providing information on the modification and requesting written feedback on the proposal. | No response received. | N/A |
| Illawarra Regional Airport | A letter was sent to IRA on 27 July 2017 providing information on the modification and requesting written feedback on the proposal. | No response received. | N/A |
| Australian Department of Environment and Energy | A letter was sent to DoEE on 27 July 2017 providing information on the modification and requesting written feedback on the proposal. | No response received. | N/A |

## 1.5 Structure of Environmental Assessment

The EA has been prepared in accordance with the EP&A Act 1979 and the EP&A Regulation 2000. It is set out as follows:

> **Section 1** introduces the proposed Concept Plan Modification, providing background to the project, requirements to be addressed and consultation undertaken.

> **Section 2** describes the existing site use and surrounding development patterns

> **Section 3** describes the proposed modifications to the approved Concept Plan, the need for these modifications and the overall Concept Plan Modification

> **Section 4** assesses relevant Federal, State and Local legislation applicable to the proposed development

> **Section 5** assesses environmental impacts

> **Section 6** details the proposed Concept Plan Modifications

> **Section 7** provides a conclusion to the report

> **Section 8** identifies reference material used in this report

# 2 Site Description

This section describes the existing site use and surrounding development patterns

## 2.1 Site Location

The Tallawarra Study Area is a 535.9ha landholding located on the Tallawarra Lands in Yallah, approximately 13 kilometres from the Wollongong Town Centre. The site is located within the Wollongong LGA and encompasses the eastern and southern slopes of Mount Brown, the western foreshore of Lake Illawarra and a number of wetlands and watercourses in the south, the largest being Duck Creek. The site borders the Shellharbour LGA to the south. Yallah Bay Road runs east/west through the centre of the site and the Tallawarra Gas-fired Power Station is present in the east of the study area, although it is excluded from the Concept Plan.

The study area is defined by the following:

- Lot 1 DP 551658
- Lots 30 and 31 DP 1175058
- Lot 20 DP 633211
- Lot 102 DP 716727
- Lots 1 and 3 DP 109795
- Lot 15 DP 1050255
- Lot 151 DP 628980
- Lot 1 DP 543285
- Lots 10 and 11 DP 552933
- Lots 1 and 2 DP 792664
- Lots 7 and 8 DP 1049520
- Lot 1 DP 1146409
- (Southern) Part Lot 1092 DP 1140369

## 2.2 Site Description

The subject site is predominately rural and has been used for Power Station operations since the late 1950's. Large portions of the site have undergone past disturbance particularly in the south and east where a number of former ash settling ponds used by the original coal-fired Tallawarra Power Station now remain. The construction of the current power station and its operational infrastructure has further contributed to the disturbance of the site.

Extensive vegetation clearance has occurred across the remainder of the site for grazing purposes, resulting in large areas of exotic grassland. The majority of intact vegetation occurs in the south eastern corner of the site with smaller areas in the north, adjoining a large stand of vegetation in Mount Brown Reserve, as well as along the south western boundary.

The subject site has a varying topography, ranging from near level ground to steep slopes. The northern boundary of the site is characterised by a steep hill side (Mount Brown) sloping downwards towards the east, south and southeast. The ground surface near Yallah Bay Road is generally near level (<1° grade) and forms part of an alluvial flood plain and wetlands with exception of the areas near the western boundary. The area near the western site boundary (south of Yallah Bay Road) is locally elevated rising towards the Princes Highway to the west and sloping down towards the east.


BRIDGEHILL

# Cadastre Plan

## TALLAWARRA LANDS

### Legend

- Lot Layout
- Watercourses (LPI)
- Cadastre (DFSI-SS, 2017)

**FIGURE 2-1**

**1:9,000 Scale at A3**

Metres

0 100 200 300 400

N

Cardno

Map Produced by Cardno NSW/ACT Pty Ltd (WOL)
Date: 2017-10-25 | Project: 82017142-01
Coordinate System: GDA 1994 MGA Zone 56
Map: 82017142-01-GS-024-Cadastre_Plan.mxd 02
Aerial imagery supplied by nearmap (October, 2016)

### 2.2.2 Tallawarra Power Station

The Tallawarra Power Station is located in the southern portion of the North Shore Precinct, however was not included in the Concept Plan. The power station site is approximately 32.5ha in size (including switchyard but excluding the constructed wetlands area south of Yallah Bay Road).

Before the current gas-fired power station commenced operations in January 2009, the site was a 320MW coal-fired power station which operated between 1954 and 1989. The former plant and many ancillary buildings have been demolished and the operational areas of the site remediated.

### 2.2.3 North Shore Precinct

The North Shore Precinct is located to the south of the established suburbs of Kanahooka and Koonawarra, to the north of the Tallawarra Power Station. The precinct is 110ha in size and positioned on the eastern slopes of Mount Brown fronting Lake Illawarra. The North Shore precinct is situated along a ridge that runs in a north west to south east direction with a gentle to moderate slope to the north and south of the ridge line.

The majority of the North Shore Precinct consists of rural fenced paddocks, which were previously used for agricultural purposes. A rural homestead and compound is located in the northern most part of the site and includes dams, fences, small fenced paddocks and animal shelters. A high voltage power line, with associated towers, runs through the central portion of the Precinct in a north-south orientation.

The precinct has an approved residential density of 310 residential lots. These lots will be positioned in the middle section of the site, with foreshore land set aside for public open space and the conservation of existing vegetation. This precinct will be connected to Kanahooka through the extension of the existing Gilba Road, which connects through to Fowlers Road and to the Princes Motorway.

### 2.2.4 Central Precinct

The Central Precinct is located adjacent to existing residential development on the southern side of Mount Brown in Dapto. The precinct is 210ha in size and is positioned on the southern slopes of Mount Brown, providing an outlook to the south with views towards Albion Park and Shellharbour. The precinct extends from the Princes Highway in the west through to Lake Illawarra in the east. The topography of the Central Precinct is variable with the northern portion dominated by a moderate to steep slope with a southern aspect that grades into a generally flat ground surface in the vicinity of Yallah Bay Road.

The area is accessed by Yallah Bay Road which provides connection through to the Tallawarra Power Station and the tourism site. Yallah Bay Road connects to the Princes Highway which provides connection to Dapto in the north and Albion Park Rail in the south.

The precinct is proposed to house 340 standard residential lots, with a further 10 large lots. Industrial and light industrial land will be included towards the Tallawarra Power Station along the northern side of Yallah Bay Road. Additionally, the precinct will house a neighbourhood centre and a 2.5ha tourism site to be located on the headland at the eastern portion of the precinct. The 2.5ha tourism site is the only part of the Central and North Shore precincts located south of Yallah Bay Road.

### 2.2.5 Southern Precinct

The Southern Precinct is bounded by the Princes Highway, residential development in Haywards Bay, Duck Creek and existing wetlands adjacent to Lake Illawarra. The majority of this precinct is located within an existing bunded area that was formerly used as an ash dam for the previous coal fired power station. The site also comprises cleared paddocks for agricultural use, dense vegetated areas of both natural and introduced species, a road base stockpile and an asbestos landfill.

The precinct is proposed to contain 350 residential lots to the south of the area, as well as a 200 dwelling retirement village and primary school. The precinct will also contain a significant area of commercial zoned land.

The site is proposed to be accessed from the north from Yallah Bay Road and south via the existing suburb of Haywards Bay.

## 2.3 Surrounds

The Tallawarra Lands Study Area comprises the majority of the Yallah locality and is located between the Illawarra Escarpment and Lake Illawarra. The site benefits from close proximity to established transport including the Illawarra Rail Line, the Princes Motorway near the western boundary of the site and the Illawarra Regional Airport south west of the site. Specifically, the site is bound:

- *To the north:* by Mount Brown and existing residential development in the suburbs of Koonawarra and Dapto
- *To the east:* by Lake Illawarra
- *To the west:* by the Princes Highway, the suburb of Penrose and the West Dapto Urban Release Area
- *To the south:* by the suburb of Haywards Bay

# 3 Modification Proposal

This section describes the proposed modifications to the approved Concept Plan, the need for these modifications and the overall Concept Plan Modification

## 3.1 Need for approval modification

The Tallawarra Lands is a Transitional Part 3A project, and the modification provisions in section 75W (now repealed) of the EP&A Act continue to apply pursuant to clause 3C of Schedule 6A of the EP&A Act. Section 75W provides:

> *"(2) The proponent may request the Minister to modify the Minister's approval for a project. The Minister's approval for a modification is not required if the project as modified will be consistent with the existing approval under this Part."*

The main consideration in determining whether proposed amendments are consistent with the Tallawarra Lands Concept Plan Approval, and therefore whether a modification to the approval is needed, is whether they are consistent with the description of the project to which the approval applies and whether they satisfy the requirements of Tallawarra Lands Concept Plan Approval, Terms of Approval No. A1, specifically:

> *"Concept approval is granted to the development as described below;*
>
> *a) Three residential precincts accommodating up to 1,010 lots – the Northshore Precinct, Central Precinct and the Lakeside (southern) Precinct;*
>
> *b) Lands for a neighbourhood centre within the Central Precinct;*
>
> *c) Lands for a future tourism facility on the eastern headland of the central precinct;*
>
> *d) Lands within the central and southern precincts for industrial, light industrial and business purposes;*
>
> *e) An internal road network. A network walkways, cycle paths, share paths; and*
>
> *f) Open space, public recreation areas and conservation lands."*

The following sections consider the amendments comprising the Modification Proposal in relation to the Tallawarra Lands Concept Plan Approval and associated environmental assessment documentation. For each amendment, a conclusion is provided regarding whether a modification to the Tallawarra Lands Concept Plan Approval is required.

### 3.1.1 Increase Densities

As indicated above, Terms of Approval No. A1 (a) provided that:

> *a) Three residential precincts accommodating up to 1,010 lots – the Northshore Precinct, Central Precinct and the Lakeside (southern) Precinct;*

Since the approval was granted on 23 May 2013, a new Regional Strategy has been released by the NSW State Government. The *Illawarra-Shoalhaven Regional Plan* (DP&E, 2015) called for increases to the supply of residential housing throughout the Illawarra and changes to the housing stock that is supplied to the market in the form of medium and high density living. This regional plan was informed by a range of further studies that investigated the needs of the Illawarra in regards to housing stock. These studies included the 'Wollongong City Housing Study: A final report' (Wollongong City Council, 2005), 'Review of Illawarra housing market' (SGS Economics and Planning, 2014a) and 'Housing submarkets in the Illawarra' (SGS Economics and Planning, 2014b).

The Wollongong City Housing Study identified that the Illawarra required future developments to provide a mix of housing types to meet the projected demographics of the area. This mix included 50% of future dwellings constructed to be detached, with 31% medium and 19% high-density dwellings (WCC, 2005). It is acknowledged that this study is now over a decade old but the trends identified have played out, with this housing mix also recommended in the two SGS Economics and Planning Reports (2014a and 2014b). These also argued that increased densities are required within Wollongong, with this improving service

provision and providing a diversity of housing choice for the aging population. The report noted that increased densities will need to be located near amenity and services to ensure that the benefits of denser living styles can be achieved. This report highlighted that there is a projected lack of supply of semi-detached housing stock that will occur from 2021 onwards.

This requirement for an increase in building densities and a greater mix of dwelling types was acknowledged by Wollongong City Council in the submission that was raised during the exhibition period for the initial Concept Plan Approval. Section 9 within this submission talked to Social Planning issues with the following point raised:

> *"Council supports a varied housing product mix insofar as providing an assortment of allotment sizes that will provide a variety of housing types i.e. multi-residential dwellings, 2-3 storey town houses, dual occupancy, 3-4 storey residential apartments. The appropriate allotment mix should offer 50% detached housing i.e. 450 - 700m2 lots and the remaining balance an assortment of allotments that will provide a rich mix of housing types.*
>
> *This approach is supported by the Illawarra Regional Strategy (IRS) in section 6 of the Housing and Settlement chapter. The outcome of this strategy is to provide an appropriate mix of housing from detached housing (50%) to medium (35%) and high (15%) density housing around neighbourhood centres or key services.*
>
> *Provision of an assortment of allotment sizes that would provide an opportunity to locate medium and high residential density around the neighbourhood centre or key services would increase the proposed overall densities of 13 to 15 dwelling /ha. It is therefore recommended the proposed residential densities are revised upwards to allow for medium to high density development and a higher percentage of unconventional lot sizes."*

The increase in residential dwelling densities proposed within these amendments would provide for a greater mix of dwelling types, encouraging medium density living through the provision of lots suitable for terrace and townhouse dwellings. Additionally, the proposed modifications will provide lots that are suitable for small scale apartment developments in close proximity to amenity and lifestyle centres within the Tallawarra Lands. As such, this amendment has been included as part of the Modification Proposal.

### 3.1.2 Boundary Increases

The Tallawarra Lands Concept Plan Approval, Terms of Approval No. A2 provided that;

> *"The development shall be undertaken generally in accordance with:*
>
> - *The Environmental Assessment dated February 2011 prepared by DFP Planning Consultants, except where amended by the Preferred Project Report dated June 2012 prepared by DFP Planning Consultants including the supplementary Flood Risk Assessment Report prepared by Bewsher (ref J1898L_2), dated 10 January 2013;*
> - *The statement of Commitments prepared by DFP Planning Consultants; and*
> - *The following drawings.*

| *Author, Drawing No./Report* | *Name of Plan* | *Date* |
|---|---|---|
| *Warren Lee Urban Design* | *TRUenergy – Tallawarra Lands Concept Plan* | *7 May 2012* |
| *Corkery Consulting, Landscape Plan Report, Figure 30, PPR Appendix K* | *The Street Hierarchy* | |

> *Except for as modified by the following (other conditions of approval) pursuant to Section 75O(4) of the Act."*

As discussed above there is demand for increased residential densities, along with housing stock generally across the Illawarra. Energy Australia are currently unwilling to develop the Lakeside Precinct, sterilising approximately 350 lots. The proposed boundary increases described in Section **3.2.2.1.1** and **3.2.2.1.2** below would help to offset the loss of residential and industrial lands associated with the Lakeside Precinct, while contributing to meeting the demand for additional housing stock. To assess the Environmental Impacts

associated with these modification a range of assessments have been undertaken, with detail provided within **Section 5** of this report. A significant focus of these assessments was the impact that the modified boundaries would have on the noise impact generated by both the approved Tallawarra A and B power station and the impacts of the Princes Motorway located adjacent to the site. These aspects are directly addressed in **Section 5.2**. Other assessments undertaken ensured that the geology, ecology, contamination, traffic, stormwater and flooding, bush fire, heritage and the visual Impact where adequately assessed.

### 3.1.3 Legal Precedent

The legal test for a Section 75W modification has been identified by the NSW Court of Appeal in the case of *Barrick Australia Ltd v Williams (2009),* a case commonly referred to as Cowral Gold.

In this case the proponent sought:

> Increased ore extraction by 53M/t

> Increased production from 6.9 million to 7.4 million t/yr

> Increased employees 200 to 315

> Extended operating life by 11 years

> Increased infrastructure.

The Court identified that a *'radical transformation'* to the approved scheme could not be undertaken as a Section 75W modification, with general requirements identified by the Court of Appeal for a Section 75W modification comprising:

> The approval must be one to which Part 3A relates

  - This requirement is satisfied as a Part 3A Concept Approval applies.

> The proposed modification must have 'limited environmental consequences beyond those which had been the subject of assessment'

  - This Environmental Assessment seeks to illustrate the limited environmental consequences through comparison between the approved Concept Plan and proposed modifications.

> The consent authority must be the Minister for Planning

  - The Minister or their delegate is the consent authority.

A review of the legal precedent illustrates that the proposed modification satisfies the legal precedent for a Section 75W modification subject to the modification having limited environmental consequences beyond those of the originally approved development. The environmental assessments undertaken and detailed within this report illustrate that the proposed modification subject to the identified mitigation and management measures will not create a significant environmental impact beyond that approved by the Concept Plan. A summary of the findings of the key studies is detailed below.

> **Traffic assessment** – Considered the impacts of the revised development yield, previous land use assumptions and proposed changes to access arrangements. Previous traffic models were updated to reflect these changes and found that the revised development yield did not result in critical network operational concerns when compared with the approved concept yield.

> **Acoustic assessment** – Considered the industrial, transport and urban noise affectation, finding that the noise impacts resulting from the development will be no greater than noise impacts on the previously approved lots. Therefore, no land use planning issues from cumulative industrial operations are expected for the North Shore or Central precincts.

> **Ecological assessment** – Considered direct and indirect impacts resulting from the proposed modification. Direct impacts to the ecological values are limited, as the majority of the development is associated with cleared land, with only a further 4.2% of the development site being cleared as a result.

  Indirect impacts from the proposed development may include noise and/or erosion associated with the construction phase of the project. These impacts will be managed through the development of a CEMP

and a landscape scheme using native species to help reintroduce vegetation in areas of the site currently comprising cleared grass, improving biodiversity and visual amenity, with associated environmental sustainability benefits.

> **Bushfire Assessment** – Considered the proposed modification against the provisions within *Planning for Bush fire Protection 2006* (PBP) to ensure compliance can be achieved. These provisions require Asset Protection Zones and Access to be provided. These measures have been incorporated into the proposed modification layout to ensure compliance with PBP.

> **Geotechnical Assessment** – Considered the potential for stability issues through desk top and intrusive investigations. The assessment found that the expanded Central Precinct poses moderate geotechnical risks, with the North Shore Precinct identified as low risk. The potential risks can be managed by appropriate engineering design, which would be determined through future intrusive investigation and assessment prior to works commencing.

> **Contamination investigation** – Comprised desk top and intrusive investigations. The assessment identified that there are currently no Contaminants of Potential Concern (COPC) present in the Central and North Shore Precinct modification areas at concentrations above the Tier I human health screening values.

  Copper is present at the site at concentrations above the Tier I ecological screening values. However, ecological receptors of significance were not identified at or within close proximity to the modification areas. The overall potential risk to the local environment based on the measured copper concentrations is considered low. A Site Auditor has been engaged to review the investigations undertaken, providing a further level of rigour to the assessment.

> **Visual Impact Assessment** – Was undertaken using the methodology employed for the Concept Approval. The assessment found that while the development would result in additional urban development being visible from viewing points beyond the site, the potential impact is limited and partially offset through the relocation of powerlines underground and removal of associated stanchion's.

  The proposed changes are assessed and clearly illustrated through a photographic survey and the production of artist's impressions to determine the overall impact of the changes. The modifications are characterised by the backdrop of the Escarpment, which forms the dominant feature and minimises sky lining, which in conjunction with controls to cap building height and to carry out ridgeline tree planting will limit visual impact.

  The environmental assessment findings clearly demonstrate that the proposed development has limited environmental consequences beyond those associated with the existing approval and the proposed modification is not a radical transformation from the approved.

## 3.2 Description of the Modification Proposal

The proposed modifications to the Concept Plan result from the desire to provide a residential housing mix that meets the increased demand for a broader range of housing types in an inviting community setting, while offsetting the reduced yield associated with current delays in the development of the Lakeside Precinct. Bridgehill pride themselves on creating environments that are inclusive and celebrate the environment in which the development is placed.

### 3.2.1 Overview

The proposed changes seek to increase the residential capacity within the Tallawarra Lands site. The proponent aims to achieve these through amendments to the approved Concept Plan. This involves adjusting the zone extents of the R2, E3 and RE1 zones within the North Shore Precinct, and the R2, R5, E3, B1 and IN2 zones within the Central Precinct subject to further environmental assessment. A breakdown of the proposed adjustments to zone extents and the area in hectares affected by the proposed changes is provided in **Sections 3.2.2.1.1** and **3.2.2.1.2** below.

Further to this, the mix of housing types provided for will move towards smaller lot sizes to encourage townhouse and villa style dwellings over standard detached housing stock. These changes will combine to enable an increase in dwelling yield from the approved 1,010 lots to a proposed 1,480 lots.

The open space extents within the North Shore Precinct will remain largely unchanged, with the landscaped buffer identified by the Corkery Report located to the south west of the residential footprint pushed further south west to accommodate the expanded residential footprint. The Landscape Plan for the North Shore Precinct, provided at **Appendix O**, identifies a Woodland Habitat and Screen Planting in this area. The two Cardno Landscape drawings at **Appendix O** for the North Shore and Central precincts respectively are based on the detail in the Corkery Landscape Plan and simply amend this plan to accommodate the revisions to the development layout. Consequently, landscaping types, plantings and facilities will remain as is. The sports fields and associated facilities will remain.

**Figure 3-1** below shows the modified Concept Plan, clearly demonstrating the proposed land uses and landscaping within the North Shore and Central Precincts. To enable these changes a number of modifications to the Concept Plan conditions of approval will be required. These modifications are discussed in more detail in **Section 3.2.2** below.

## LEGEND

- BOUNDARY
- EXISTING + PROPOSED GRASS
- PROPOSED TREE PLANTING
- BICYCLE PATH
- SHARED USE PATH
- FOOTPATH (PEDESTRIAN ONLY)
- STORMWATER BASIN / POND / DRAINAGE CHANNEL

### LAND USES

- RESIDENTIAL
- INDUSTRIAL
- OPEN SPACE AND ENVIRONMENT
- NEIGHBOURHOOD CENTRE

# CONCEPT PLAN

Cardno
Shaping the Future

landscape architecture
urban design
environmental management

SCALE NTS

BRIDGEHILL GROUP PTY LTD **TALLAWARRA LANDS**

| DATE | DRAWING NO | ISSUE |
|---|---|---|
| 30.05.18 | SK1000 | 1 |

### 3.2.2 Modification Proposal Components

#### *3.2.2.1 Boundary Increases*

The proposal seeks to increase the boundaries for both the North Shore and Central precincts. These increases have been considered with regard to the outcomes of various environmental assessments detailed in **Section 5** below.

##### 3.2.2.1.1 North Shore Precinct

1. Residential Footprint Expansion

The approved Concept Plan provides a residential footprint of approximately 20.61 hectares within the North Shore Precinct. The proposed modification to the Concept Plan increases this residential footprint to 33.85 hectares. Further investigations following the Concept Plan approval identified that this land is suitable for residential development as discussed in **Section 5** of this assessment. The investigations found that the increased footprint would not impact on the environmental context of the site or surrounds. Furthermore, impacts on amenity of future residents within the site can be adequately addressed.

2. Open Space and Environment Footprint

The approved Concept provides an open space and environmental footprint of approximately 24.62 hectares. The proposed modification to the Concept Plan reduces this footprint to 11.59 hectares to allow for an increase in residential land use.

A limited area of E3 zoned land within the eastern portion of the site is proposed to be rezoned to RE1 to allow contiguous public recreation uses to occur in this area, as proposed by Bridgehill. This outcome is preferable to a small fragmented area of RE1 that has limited potential for active public uses. The E3 zone has limited value as environmentally managed land, as it does not hold significance from an ecological or landscape perspective, with the ground primarily cleared and containing exotic grass land.

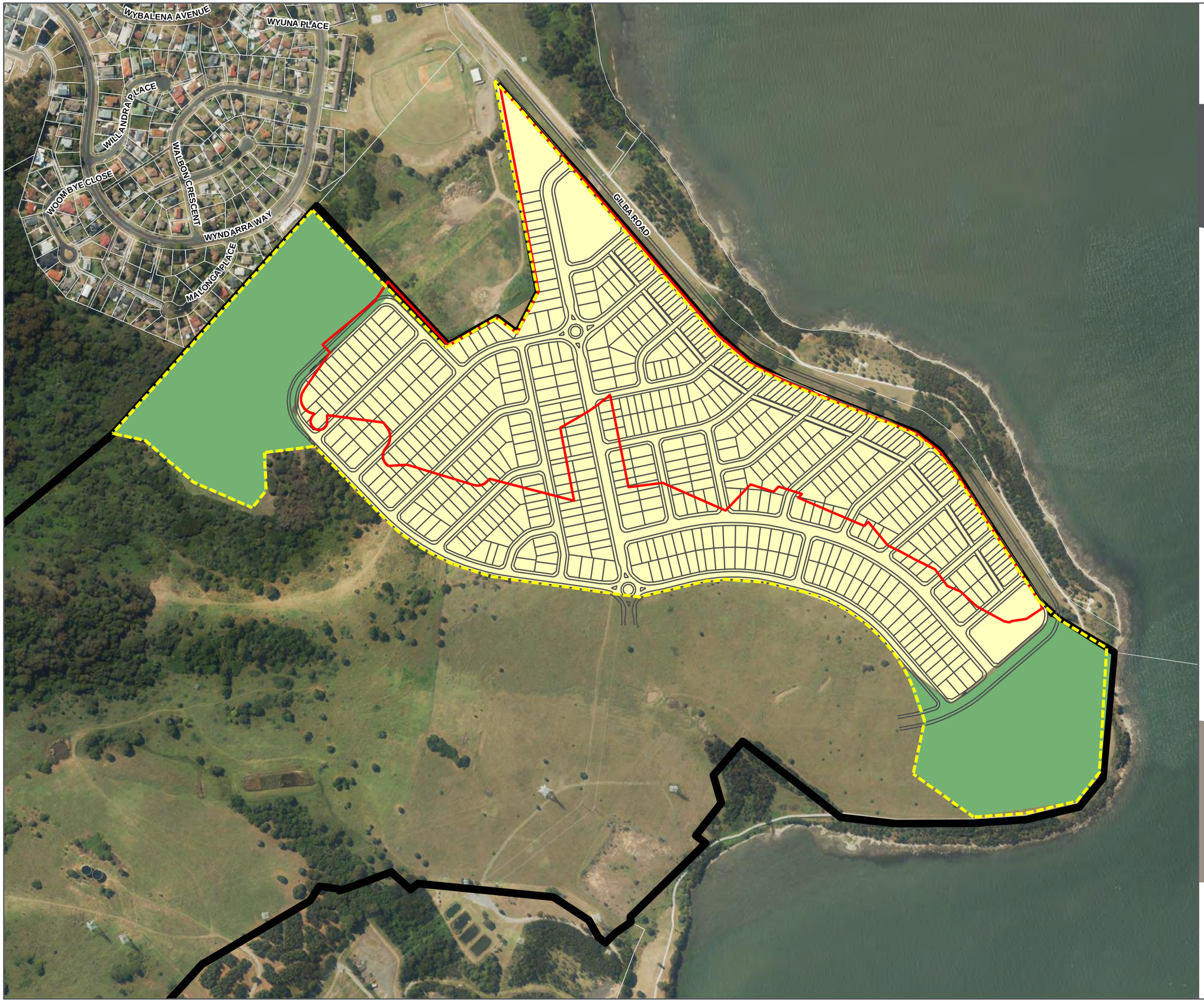
The adjustments to the land use boundaries within the North Shore Precinct are discussed in **Table 3-1** below.

**Table 3-1 Proposed Changes to Land Use within the North Shore Precinct**

| Land Use | Proposed Land Use Changes | Existing Land Use Area | Proposed Land Use Area | Justification |
|---|---|---|---|---|
| **Residential** | Expand the R2 – Low Density Residential zone south into the E3 – Environmental Management zone. | The existing residential footprint within the North Shore Precinct on the approved Concept Plan is 20.61 hectares. | The proposed residential footprint within the North Shore Precinct is 33.85 hectares. | Further investigations, post Concept Plan approval have deemed this land suitable for residential development. Key aspects to consider when investigating the suitability relate to noise, visual and ecology, which are discussed in **Section 5**. The investigations found that subject to appropriate mitigation the proposed expansion is acceptable. |

**Figure 3-2** below shows the proposed land uses within the North Shore Precinct.

**Figure 3-3** below compares the approved land uses with the proposed land uses within the North Shore Precinct.




# Proposed Land Uses
# North Shore Precinct

## TALLAWARRA LANDS

### Legend

- Concept Plan Boundary
- Concept Approval
- Indicative Lot Layout
- Proposed Superlot Boundary

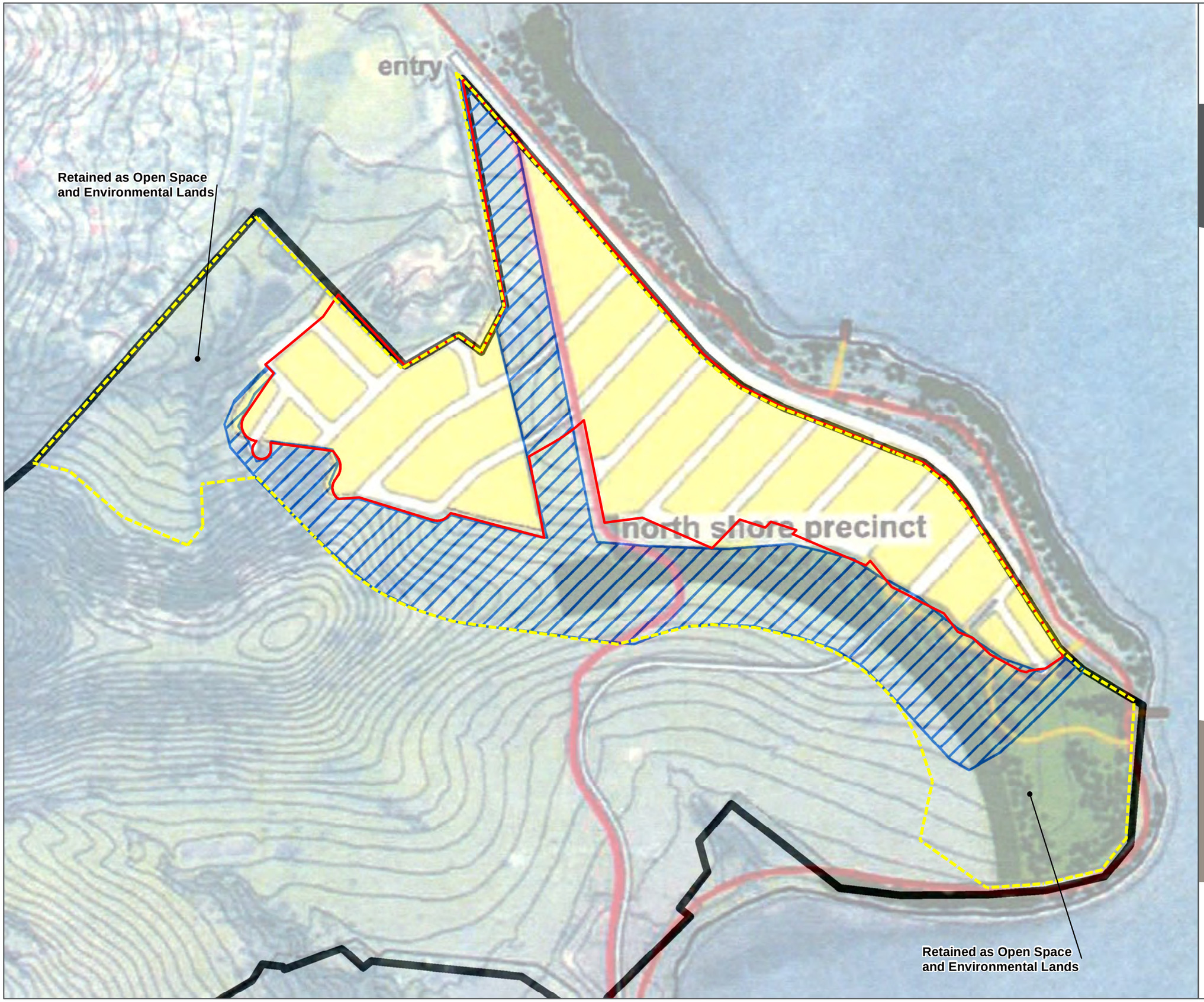
**Proposed Land Use**

- Residential Lands
- Open Space and Environmental Lands
- Cadastre (DFSI-SS, 2017)

**1:5,000 Scale at A3**

Metres
0 50 100 150 200

Map Produced by Cardno NSW/ACT Pty Ltd (WOL)
Date: 2018-05-24 | Project: 82017142
Coordinate System: GDA 1994 MGA Zone 56
Map: 82017142-01-GS-052-ProposedLandUseNorthShore.mxd 04
Aerial imagery supplied by nearmap (October, 2016)

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# Comparison of Approved and Proposed Land Uses North Shore Precinct

## TALLAWARRA LANDS

**Legend**

- Concept Plan Boundary
- Concept Approval
- Proposed Superlot Boundary

**Proposed Land Use**

- Residential Lands

1:4,514 Scale at A3

Metres

0 50 100 150 200

N

Cardno

Map Produced by Cardno NSW/ACT Pty Ltd (WOL)
Date: 2018-05-30 | Project: 82017142
Coordinate System: GDA 1994 MGA Zone 56
Map: 82017142-01-GS-054-ApprovedandProposedNorth 01.mxd 04
Aerial imagery supplied by nearmap (October, 2016)

#### 3.2.2.1.2 Central Precinct

1. Residential Footprint

   The approved Concept Plan provides a residential footprint of approximately 33.77 hectares within the Central Precinct. The proposed modification to the Concept Plan increases this residential footprint to 33.85 hectares. Further investigations, post Concept Plan approval have deemed this additional land suitable for residential development. Key aspects to consider when investigating the suitability relate to noise, topography, visual and ecology, which are discussed in **Section 5**. The investigations found that subject to appropriate mitigation the proposed expansion is acceptable.

2. Industrial Footprint

   The approved Concept Plan provides an industrial footprint of approximately 13.89 hectares within the Central Precinct. The proposed modification to the Concept Plan increases this industrial footprint to 16.91 hectares, however maintains a portion of environmental lands to the north to create a landscape buffer between the residential and industrial land uses.

   Additionally, it is proposed that the IN1 portion of the site be rezoned to IN2 to increase the light industrial lands within a consolidated area north of Yallah Bay Road, which there is currently a far higher demand for. Extensive areas of IN1 land are retained south of Yallah Bay Road. The consolidation of IN2 land north of the Road will provide an extended area for light industrial uses, which are compatible with the adjacent power station use.

   The location of the IN1 zone adjacent to the western side of the power station has the potential to simply push undesirable off site amenity impacts closer to residents in the Central Precinct. Whereas the specific intent of the IN2 zone as identified by the objective *"To minimise any adverse effect of industry on other land uses*". Consequently, the IN2 zone will act as a suitable buffer between the power station and the residential lands. Furthermore, it is understood that a key element of the Tallawarra Concept Approval was job creation. The extension of the IN2 zone is likely to facilitate a greater increase in jobs than IN1 land, due to the larger number of people generally employed in the lighter industrial land uses that are permissible in the zone given heavier industrial jobs are generally highly automated in the current industrial climate. The IN2 objectives are supportive of job creation with the following objectives of specific relevance:

   - *To encourage employment opportunities and to support the viability of centres.*
   - *To support and protect industrial land for industrial uses.*
   - *To encourage appropriate forms of industrial development which will contribute to the economic and employment growth of Wollongong.*

   In summary, the extension of the IN2 zoned land will help to facilitate employment within the Tallawarra precinct while providing a more appropriate land use buffer.

3. Open Space and Environment Footprint

   The approved Concept Plan provides an open space and environmental footprint of approximately 14.72 hectares. The proposed modification to the Concept Plan reduces this footprint to 12.35 hectares to allow for increased residential and industrial land uses.

4. Neighbourhood Centre Footprint

   The reduced neighbourhood centre footprint is considered appropriate, as the size of the approved neighbourhood centre footprint is excessive compared to the anticipated demand for commercial and retail space in the area. The residual neighbourhood centre land will more than adequately cater for the retail and commercial needs of the surrounding residents.

The adjustments to the land use boundaries within the Central precinct are described in **Table 3-2** below.

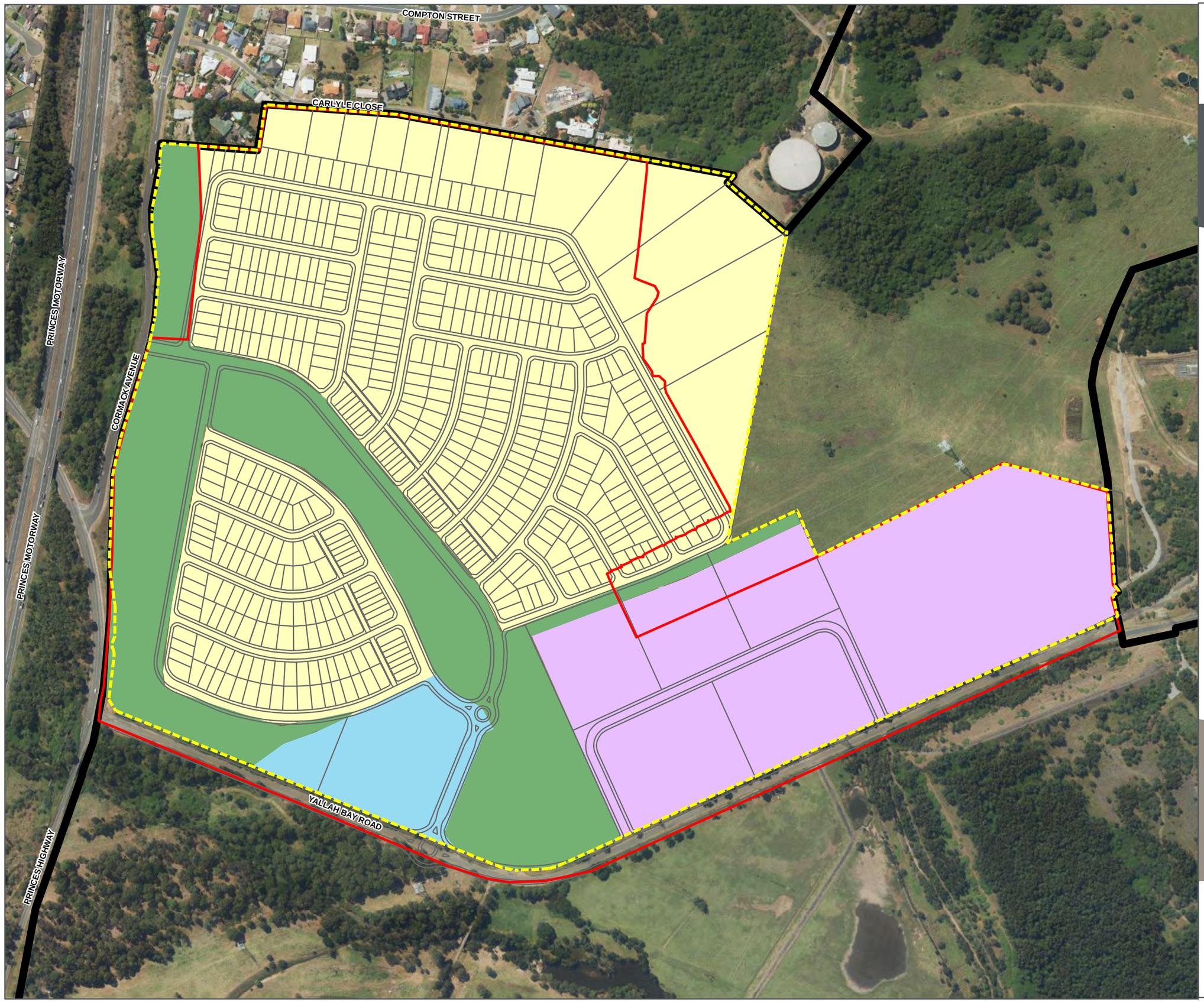
**Table 3-2 Proposed Changes to Land Uses within the Central Precinct**

| Land Use | Proposed Land Use Changes | Existing Land Use Area | Proposed Land Use Area | Justification |
|---|---|---|---|---|
| **Residential** | Expand the R2 – Low Density Residential zone into the E3 – Environmental Management zone.<br>Expand the R2 – Low Density Residential zone into the R5 – Large Lot Residential zone.<br>Expand the R5 – Large Lot Residential zone into the E3 – Environmental Management zone. | The existing residential footprint within the Central Precinct on the approved Concept Plan is 33.77 hectares. | The proposed residential footprint within the Central Precinct is 40.17 hectares. | Further investigations, post Concept Plan approval have deemed this land suitable for residential development. Key aspects to consider when investigating the suitability relate to noise, topography, visual and ecology, which are discussed in **Section 5**. The investigations found that subject to appropriate mitigation the proposed expansion is acceptable. |
| **Industrial** | Expand the IN2 – Light Industrial zone north into the IN1 – General Industrial zone. | The existing industrial footprint within the Central Precinct on the approved Concept Plan is 13.89 hectares. | The proposed industrial footprint within the Central Precinct is 16.91 hectares. | The approved Concept Plan provides an industrial footprint of approximately 13.89 hectares within the Central Precinct. The proposed modification to the Concept Plan increase this industrial footprint to 16.91 hectares, however maintains a portion of environmental lands to the north to create a landscape buffer between the residential and industrial land uses. |
| **Open Space and Environment** | Expand the E3 – Environmental Management zone into the R2 – Low Density Residential Zone.<br>Expand the E3 – Environmental Management zone west into the B1 – Neighbourhood Centre zone. | The existing environmental footprint within the Central Precinct on the approved Concept Plan is 14.72 hectares, | The proposed environmental footprint within the Central Precinct is 12.35 hectares. | The environmental lands are reduced due to the expansion of the industrial and residential footprints. These are considered more appropriate land uses for the site to cater for the projected housing and employment demand.<br>Several areas that were identified on the approved Concept Plan for residential development have been changed to environmental lands to provide a minor offset for the loss of environmental lands in other areas throughout the Central Precinct.<br>The E3 area is proposed to be extended westwards to accommodate a park and sports |

| Land Use | Proposed Land Use Changes | Existing Land Use Area | Proposed Land Use Area | Justification |
|---|---|---|---|---|
| | | | | facility as proposed by the Concept Plan. The sports facility is currently part located within IN2 land and does not align with the IN2 zone objectives. The relocation of the sports and park area will allow industrial development to occur on the industrial zoned land, with these facilities located adjacent, providing a buffer to the neighbourhood centre. |
| **Neighbourhood Centre** | | The existing neighbourhood centre footprint within the Central Precinct on the approved Concept Plan is 5.05 hectares. | The proposed neighbourhood centre footprint within the Central Precinct is 3.62 hectares. | The reduced neighbourhood centre footprint is considered appropriate as the size of the approved neighbourhood centre footprint is excessive compared to the anticipated demand for commercial and retail space in the area. The residual neighbourhood centre land will more than adequately cater for the retail and commercial needs of the surrounding residents. |

**Figure 3-4** below shows the proposed land uses within the Central Precinct.

**Figure 3-5** below compares the approved land uses with the proposed land uses within the Central Precinct.

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# Proposed Land Uses Central Precinct

## TALLAWARRA LANDS

### Legend

- Concept Plan Boundary
- Concept Approval
- Indicative Lot Layout
- Proposed Superlot Boundary

**Proposed Land Use**

- Residential Lands
- Open Space and Environmental Lands
- Industrial Lands
- Neighbourhood Centre Lands

1:4,500 Scale at A3

Metres

0 50 100 150 200

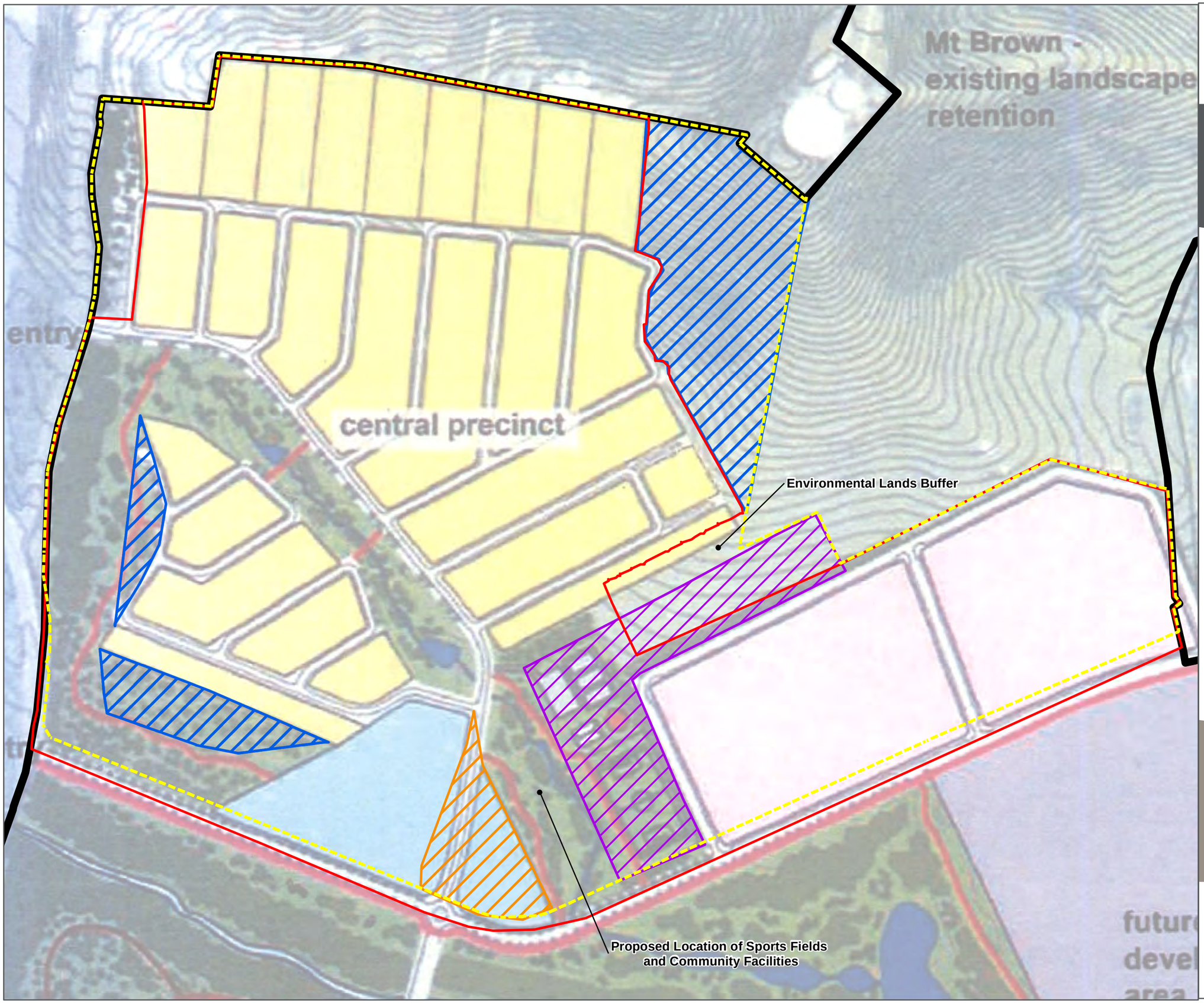
N

Cardno

Map Produced by Cardno NSW/ACT Pty Ltd (WOL)
Date: 2018-05-24 | Project: 82017142
Coordinate System: GDA 1994 MGA Zone 56
Map: 82017142-01-GS-052-ProposedLandUseCentral.mxd 04
Aerial imagery supplied by LPI (2015)

# Comparison of Approved and Proposed Land Uses Central Precinct

**TALLAWARRA LANDS**




## Legend

- Concept Plan Boundary
- Concept Approval
- Indicative Lot Layout
- Proposed Superlot Boundary

**Proposed Land Use Changes**

- Residential Lands
- Industrial Lands
- Open Space and Environmental Lands

**1:4,000 Scale at A3**

Metres

0 50 100 150 200


Map Produced by Cardno NSW/ACT Pty Ltd (WOL)
Date: 2018-05-30 | Project: 82017142
Coordinate System: GDA 1994 MGA Zone 56
Map: 82017142-01-GS-053-ApprovedandProposedCentral.mxd 04
Aerial imagery supplied by LPI (2015)

#### *3.2.2.2 Increase Densities*

In conjunction with the proposed changes to the boundaries of the two precincts discussed above, the modification to the approved Concept Plan also seeks to amend the provisions of Wollongong LEP 2009 to facilitate a greater mix of housing types and densities to meet the changing housing needs of the community. The proposed changes include:

> a reduction in the minimum lot size within the R2 zoned land

> an increase in the maximum height of building in certain areas

> an increase in the floor space ratio (FSR) in certain areas

The reductions to the minimum lot size are in keeping with other developments currently occurring throughout the Illawarra as discussed in Section 1. Both the URAs of Calderwood and West Dapto have seen lot sizes reducing to 300m$^2$ to meet the growing demand from the community for smaller and more affordable lots to meet the demographic changes occurring throughout the Region.

The proponent seeks a reduction of the minimum lot size throughout the R2 zoned land to 299m$^2$ in both the North Shore and Central precincts to further meet this growing demand for a range of lot sizes. It is envisaged that a range of lot sizes will be provided to ensure a diverse range of housing options are produced, enabling suitable lots for terrace, town house, villa and detached housing stock. The 299m$^2$ minimum lot size will not be applied to all lots with lots envisaged to range in size from 300m$^2$ up to 800m$^2$ for standard residential purposes.

The proposal also seeks for a strip of R2 land along the foreshore of Lake Illawarra be provided with a minimum lot size of 199m$^2$. The foreshore space is seen as a key location within the Tallawarra Lands site, with this space earmarked for activation. By providing a minimum lot size of 199m$^2$ along this section of land it is expected that further activation will occur. These lots will be ideally positioned to enable terrace style housing with rear lane access, enabling these dwellings to actively interface with the street and foreshore opposite creating an inviting environment for future residents and visitors to enjoy this enviable location.

**Figure 3-1** details the modified Concept Plan for these two precincts, showing the full range of lot sizes that are envisaged to be included in the development of these areas.

The proposal also seeks to amend the existing Height of Building and FSR controls to facilitate the development outcome outlined in the modified concept plan. Where residential apartment buildings are identified, the maximum height of building is proposed to increase to 15m (4 storeys) with a FSR of 1.5:1. Where terrace style housing is proposed along the foreshore and open space areas, the FSR is proposed to increase to 0.75:1.

The proposed building heights and FSRs for the North Shore and Central precincts are shown in **Figure 4-3** and **Figure 4-4**.

#### *3.2.2.3 Concept Approval Condition Amendments*

A number of modifications are required to the Concept Approval both to reflect the changes in density and extent of development, along with Bridgehill only entering into an agreement with Energy Australia for the North Shore and Central Precincts. These changes are generally minor in nature, with the majority relating to clarifying the wordings of these conditions and addressing changes to the road network affecting the Central Precinct. Each of the conditions affected and the proposed amendments are discussed below.

##### 3.2.2.3.1 Condition 12 – Engagement of a site auditor to verify the adequacy of asbestos soil sampling and asbestos contamination investigations

Condition 12 requests verification from a NSW EPA Site Auditor, accredited under the *Contaminated Land Management Act 1997*, as to the adequacy of the previous investigations undertaken to inform the Concept Approval in July 2010. Additionally, this condition requires the Site Auditor to provide a Site Audit Statement and Site Audit Report (SAS/SAR) confirming that the site is considered suitable for the proposed use. Further works, including assessment and remediation of land, may be required by the site auditor following approval of the concept plan approval modification. At this stage of the project, it is not possible to receive a site suitability statement from the appointed Site Auditor, based on the Concept Plan land uses. Additional

assessment and or remediation may be required in the future and these works will be subject to review and endorsement by the appointed Site Auditor.

It is proposed to amend this condition to require Site Auditor review and endorsement of site use suitability as part of any future development application for the actual subdivision of the land. The certification of land use suitability by the Site Auditor should be extended to allow an endorsement that the 1) land is suitable for the proposed use (Section A SAS/SAR) or 2) can be made suitable for the proposed use, subject to implementation of a RAP (Section B SAS/SAR), and completion of subsequent remediation and validation works to be undertaken in conjunction with subdivision works.

Condition 12, as it currently states, requires;

> *"The first future application to Council (refer to Condition A6) must include a verification from a Site Auditor accredited under the Contaminated Land Management Act 1997 to as to the adequacy of the investigations and asbestos soil sampling undertaken by Douglas Partners (July 2010) and certification of the suitability of the site for the proposed use."*

#### 3.2.2.3.2 Condition 15 – Upgrade of the junction of the Princes Highway and Yallah Bay Road to a roundabout

Condition 15 is ambiguous in its current state as it refers to an application which includes works, conversely, it refers to Condition A6 (super lot subdivision), which does not include works. It is unclear whether this requirement is intended to apply to a development application for superlot subdivision that does not include any physical works or a subsequent application.

Given the uncertainty around the timing of the Albion Park Rail Bypass (APRB), it would be onerous to require design development at this stage of the process, with associated sign off by both Wollongong City Council and Roads and Maritime Services (RMS).

It is proposed to amend the timing of the design to be required in connection with the future subdivision of the Central Precinct.

Condition 15, as it currently states, requires;

> *"The first future application to Council (Refer to Condition A6) which includes works must be accompanied by an approved design for the upgrade of the junction of the Princes Highway and Yallah Bay Road.*
>
> *The intersection must be upgraded to a roundabout. The submitted design must be to the satisfaction of and have been approved by Roads and Maritime Services and Wollongong City Council."*

#### 3.2.2.3.3 Condition 16 – Requirements for a Concept Design for the Closure of Cormack Avenue

Similar to Condition 15, this condition requires substantial design work. Creating the superlot subdivision will not allow construction of physical works and thus this condition requiring an approved concept be submitted at the time of superlot subdivision should not be required. Added to this is the uncertainty surrounding the actual works required to this intersection with the last public release of documentation for the ARPB showing this intersection as a left in/left out intersection rather than complete closure.

The condition should be amended to reflect when this work is actually required, which is proposed to be at the time the roundabout is required for the site access to the Central Precinct due to its proximity to the APRB interchange.

It is proposed to amend the timing of the design to be required in connection with the future subdivision of the Central Precinct.

Condition 16, as it currently states, requires;

> *"The first future application to Council (refer to Condition A6) for superlot subdivision must include a concept design for the physical closure of the existing junction of Cormack Avenue with the Princes Highway.*
>
> *The submitted design must be to the satisfaction of and have been approved by Roads and Maritime Services and Wollongong City Council.*

*The road closure is to be implemented in conjunction with the development of the Central Precinct."*

#### 3.2.2.3.4 Condition 25 – Satisfactory Arrangements for the provision of designated State public infrastructure

Condition 25 imports the requirement for "satisfactory arrangements" as identified in clause 6.1 of the *Wollongong Local Environmental Plan 2009* (WLEP) for State infrastructure into the Concept Approval. The WLEP requires that "satisfactory arrangements" must be made "only if the land is developed intensively for urban purposes". Consequently, clause 6.1 of the WLEP would not apply to a superlot subdivision where a future development consent would be necessary before the land could be "developed intensively for urban purposes". Instead, satisfactory arrangements for State infrastructure would need to be made before the detailed subdivision could be approved

Condition 25 requires Clause 6.1 of the WLEP to be complied with as part of the superlot subdivision DA, requiring a Voluntary Planning Agreement (VPA) to be prepared. VPA preparation at the superlot subdivision phase would place the financial burdens of any agreement on Bridgehill, which would not be fair in circumstances where a contribution is required to be paid in relation to land that will remain in Energy Australia's ownership. Additionally, negotiation of the VPA would take time, particularly when the finer details of the ultimate subdivision are not yet known.

It is proposed to amend Condition 25 to be consistent with the intention of the WLEP, which is to require that satisfactory arrangements must be made only before the land is developed intensively for urban purposes. This would effectively require a VPA with the Minister for State contributions prior to the approval of each stage of the development (other than the creation of the superlots).

Condition 25, as it currently states, requires;

> *"The first development application to Council (refer to Condition A6) must demonstrate that satisfactory arrangements have been made for the provision of designated State public infrastructure, in accordance with Clause 6.1 of Wollongong Local Environmental Plan 2009."*

### 3.2.3 Staging of Works

The staging of works to be conducted throughout the Tallawarra Lands will be detailed within the First Future application, which will be an application made to Wollongong City Council for superlot subdivision.

# 4 Regulatory Framework

This section identifies relevant legislation and polices and provides as assessment of the proposed Concept Plan Modifications against these requirements.

## 4.1 Environmental Planning & Assessment Act 1979

The EP&A Act provides the legislative framework for the assessment and approval of the proposed Concept Plan Modification.

The Tallawarra Lands Concept Approval (MP09_131) was issued on 23 May, 2013, under Part 3A of the EP&A Act. While Part 3A of the EP&A Act has since been repealed, the approval continues to operate as a transitional Part 3A project under Schedule 6A of the EP&A Act. The current project is for a modification (MOD 1) of the Approval pursuant to section 75W of the EP&A Act.

The EP&A Act defines numerous objectives. The objectives applicable to the proposed modification include:

- *the proper management, development and conservation of natural and artificial resources, including agricultural land, natural areas, forests, minerals, water, cities, towns and villages for the purpose of promoting the social and economic welfare of the community and a better environment*
- *the promotion and co-ordination of the orderly and economic use and development of land*
- *the protection of the environment, including the protection and conservation of native animals and plants, including threatened species, populations and ecological communities, and their habitat*
- *ecologically sustainable development*

The proposed modification will provide significant benefits to the Illawarra region by promoting the social and economic welfare of the community through the creation of additional housing, increased tourism and an increase in employment generating development.

Further, the modification is supported by a detailed Environmental Assessment to ensure that appropriate protection and conservation measures are identified and implemented to promote an ecologically sustainable development.

## 4.2 Planning Approach

A modification to the Tallawarra Lands Concept Approval (MP09_131) is being sought pursuant to section 75W of the EP&A Act 1979. The proposed modifications to the Concept Approval seek to increase the residential capacity of the Tallawarra Lands site through two adjustments to the zoning boundaries within the North Shore Precinct, and five adjustments to the zoning boundaries within the Central Precinct. The ability to modify the Concept Approval under section 75W is considered in the context of relevant legal precedents in **Section 3.1.3**. The legal precedents support the ability to consider the modification under section 75W of the EP&A Act.

The proposed changes include adjustments to the zone extents for the R2, E3 and RE1 zones within the North Shore Precinct, and the R2, R5, E3 and IN2 within the Central Precinct, a reduction in lot sizes and an increase in building heights and floor space ratios to facilitate a greater mix of housing types within the Tallawarra Lands site. The proposed changes will combine to enable an increase in dwelling yield from the approved 1,010 lots to a proposed 1,480 lots. The proposed modifications to the Concept Approval are discussed in more detail in **Section 3.2**.

## 4.3 Commonwealth Legislation

This section identifies relevant Commonwealth legislation and provides an assessment of the proposed Concept Plan Modifications against these requirements.

### 4.3.1 Environmental Protection & Biodiversity Conservation Act 1999

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) is the relevant Commonwealth environment and heritage legislation applicable to matters of national environmental

significance (NES). The EPBC Act requires approval from the Department of Environment (DoE) for any action that has, will have or is likely to have a significant impact on the eight listed matters of national environmental significance, which are:

- World Heritage properties
- National Heritage places
- Wetlands of international importance
- Threatened species and ecological communities
- Migratory species
- Commonwealth marine or land areas
- The Great Barrier Reef Marine Park
- Nuclear actions (including uranium mining).

The location of the Tallawarra Lands site is not within a World Heritage site, a National Heritage place, a wetland of international importance, habitat for migratory species or a Commonwealth marine or land area.

The subject land contains an area of Coastal Grassy Red Gum Forest, which is a component of Illawarra Lowlands Grassy Woodland in the Sydney Basin Bioregion, which is a listed Critically Endangered Ecological Community (CEEC) under the EPBC Act. Three distinct condition classes of this community occur in the study area, including 'Lantana' (0.99ha), 'underscrubbed' (0.25ha) and 'Scattered Paddock Trees' (0.12ha). The ecological assessment summarised within **Section 5.5** identifies that the modification would not result in significant impacts on EPBC Act listed species, with a referral not required.

## 4.4 NSW Legislation

This section identifies relevant NSW legislation and provides an assessment of the proposed Concept Plan Modifications against these requirements.

### 4.4.1 Protection of Environment Operation Act 1997

The Protection of the Environment Operation Act 1997 (POEO Act) is the key piece of environment protection legislation administered by the EPA. Under Section 43(b) of the POEO Act, a licence is required to authorise the carrying out of scheduled activities at any premises. The proposed modification does not include works identified as 'scheduled activities' in Schedule 1 of the POEO Act and therefore, the provisions of the Act do not apply.

### 4.4.2 Roads Act 1993

The Roads Act 1993 (Roads Act) provides the regulatory framework for the use, operation, opening and closing of roads in New South Wales. The Roads Act also addresses the functions of Government road authorities such as RMS and regulates activities on public roads.

The proposed modification seeks to amend the planning provisions that relate to the subject land, and does not relate to the use, operation, opening or closing of any roads. Therefore, the Roads Act is not applicable to the proposed modification.

Future development of the site will create a number of public roads and will be subject to the provisions of the Roads Act 1993. The impacts of the future development proposal (subject to a future application) on the road network are discussed in the traffic assessment at **Section 5.2**.

### 4.4.3 National Parks & Wildlife Act 1974

The Office of Environment and Heritage (OEH) administers the National Parks & Wildlife Act 1974 (NP&W Act). This Act manages:

- *Conservation of nature*

> *Conservation of objects, places and features of cultural value*
> *Public appreciation, understanding and enjoyment of nature and cultural heritage*
> *Land reserved under this Act.*

When determining applications under this Act, the consent authority must consider the objectives listed above, the public interest and appropriate management of the subject land. This Act stringently controls activities in designated parks, reserves and Aboriginal areas.

The ecological related aspects of the NP&W Act are not applicable to the proposed subdivision as the land is not within a park, reserve or area designated under Part 4 of the Act. Further, a Biodiversity Assessment Report (BAR) has been carried out by Ecoplanning (2017) to support the modification in accordance with the requirements of the SEARs. Direct impacts to the ecological values of the development site are limited, as a majority of the development is associated with cleared land. However, direct impacts will occur to small areas of native vegetation. The total extent of impact to native vegetation within the subject site is 4.24 ha, with appropriate avoidance, mitigation and offset measure are identified in the BAR.

Biosis (2017b and 2017c) prepared an Aboriginal Cultural Heritage Archaeological Report for both the North Shore and Central precincts. The assessment comprised a desktop investigation and fieldwork on site to determine areas of high, moderate and low potential to contain areas of Aboriginal heritage significance. The central precinct was determined to contain areas of high, moderate and low potential and the North Shore Precinct contains areas of moderate and low archaeological potential.

The proposed modification does not include any physical works on site, and therefore, no additional assessment is required at this time. However, subsurface investigations (test excavations) will be required for areas identified as having high and moderate archaeological potential as part of future development applications over the site.

Should a future Development Application (DA) be approved, an Aboriginal Heritage Impact Permit application to OEH will be required to destroy the listed Aboriginal sites within the study area which are currently protected under the NP&W Act.

### 4.4.4 Heritage Act 1977

The *Heritage Act 1977* lists and protects items and areas of heritage significance to NSW. The NSW Heritage Council administers the Act and listings.

A Heritage Impact Assessment (**Appendix L**) was prepared by Biosis in accordance with the NSW Heritage Manual 1996 and subsequent revisions. The assessment has assessed impact to adjacent heritage items along with identified heritage values within the study area including landscape features, built items and areas of archaeological potential.

The heritage values identified within the study area include:

> Two locally significant heritage items are located adjacent to the site including the Mount Brown Reserve and Military Bunker
> The study area was identified as containing a potential heritage item, however, this was subsequently assessed as not possessing heritage significance
> The study area contains three areas of suspected archaeological potential. This Heritage Impact Assessment has identified that these areas have a low level of archaeological potential and do not require further management.

The Heritage Impact Assessment ultimately determined that the modification is acceptable under the provisions of the Heritage Act 1977.

### 4.4.5 Rural Fires Act 1997

The *Rural Fires Act 1997* (RF Act) includes provisions relating to the prevention, coordination and management of bush fires.

The RF Act at Section 100B identifies the requirements that need to be addressed to allow a bush fire safety authority to be issued to authorise development on bush fire prone land. Section 100B states:

*(1) The Commissioner may issue a bush fire safety authority for:*

*a) A subdivision of bush fire prone land that could lawfully be used for residential or rural residential purposes, or*

*b) Development of bush fire prone land for a special fire protection purpose.*

*(2) A bush fire safety authority authorises development for a purpose referred to in subsection (1) to the extent that it complies with standards regarding setbacks, provision of water supply and other matters considered by the Commissioner to be necessary to protect persons, property or the environment from danger that may arise from a bush fire.*

*(3) A person must obtain such a bush fire safety authority before developing bush fire prone land for a purpose referred to in subsection (1).*

*(4) Application for a bush fire safety authority is to be made to the Commissioner in accordance with the regulations.*

*(5) Development to which subsection (1) applies:*

*a) does not include the carrying out of internal alterations to any building, and a1) does not include the carrying out of any development excluded from the operation of this section by the regulations, and*

*b) is not complying development for the purposes of the Environmental Planning and Assessment Act 1979, despite any environmental planning instrument.*

The proposed modification does not relate to the subdivision and/or development of bush fire prone land, and therefore, Section 100B of the RF Act is not applicable to this application. However, a bush fire assessment (**Appendix H**) was prepared for the proposed modification which concludes that the proposal to increase the footprint and density of residential lots in the North Shore and Central Precincts complies with the provisions of Planning for Bush fire Protection 2006. The future development of the site (under a separate application) will be subject to the provisions of the RF Act.

### 4.4.6 Contaminated Land Management Act 1997

The Contaminated Land Management Act 1997 (CLM Act) establishes the process for investigating and remediating land areas where contamination presents a significant risk of harm to human health or the environment. The CLM Act also ensures the accountability for remediation of contamination and appropriate level and qualification of auditing of such works.

The Tallawarra Lands site has historically been subject to a number of environmental assessments relating to contamination that includes but is not limited to:

> Register of Hazardous Materials Report, Residences in North Shore Precinct, Tallawarra Lands, March 2011, Coffey Environments / Coffey Geotechnics

> Environmental Assessment Report, Tallawarra Lands Part 3A Concept Plan Application, August 2011, DFP Planning Consultants

> Geotechnical, Contamination and Groundwater Investigation, Tallawarra Lands, December 2010, Coffey Environments / Coffey Geotechnics

Intrusive sampling undertaken during the historical environmental assessments listed above did not include sampling and analysis of soil or groundwater within the footprint of the proposed North Shore Precinct and Central Precinct modification areas of the Tallawarra Lands development. Sampling within these areas was completed during an environmental assessment undertaken by Cardno (2017c). Remediation of land within the modification areas is unlikely to be required based on the Cardno (2017c) assessment, however the requirement for remediation will be determined by the site auditor (Marc Salmon of Easterly Point Environmental Pty Ltd) in accordance with the requirements of the CLM Act.

### 4.4.7 Threatened Species Conservation Act 1995

The *Threatened Species Conservation Act 1995* (TSC Act) protects threatened species, communities and critical habitat in New South Wales. This Act provides protection for species, populations and ecological communities considered endangered, vulnerable or extinct.

Any activity, which may have an impact on protected animals, plants or locations, is rigorously assessed to ensure the justification is strong enough to permit the impact to progress. The TSC Act links with the EP&A Act to ensure consideration of these matters during the determination of a development application.

Four native vegetation types were identified in the study area. These communities include:

> Sydney Blue Gum X Bangalay – Lilly Pilly moist forest in gullies and on sheltered slopes, southern Sydney Basin Bioregion (PCT1245).

> Forest Red Gum - Thin-leaved Stringybark grassy woodland on coastal lowlands, southern Sydney Basin Bioregion (PCT838)

> Whalebone Tree - Native Quince dry subtropical rainforest on dry fertile slopes, southern Sydney Basin Bioregion (PCT1300)

> Swamp Oak floodplain swamp forest, Sydney Basin Bioregion and South East Corner Bioregion (PCT1232)

Three of these communities are listed as Threatened Ecological Communities (TEC) under the TSC Act.

In accordance with the SEARs, Ecoplanning (2017) have prepared a Biodiversity Assessment Report (BAR) to assess the biodiversity impacts of the proposal in accordance with the 'avoid, minimise and offset hierarchy', the NSW Biodiversity Offsets Policy for Major Projects.

Direct impacts to the ecological values of the development site are limited, as a majority of the development is associated with cleared land. However, direct impacts will occur to small areas of native vegetation. The total impact to native vegetation within the subject site is 4.24 ha, and appropriate avoidance, mitigation and offset measure are identified in the BAR. The implementation of the environmental safeguards identified in the BAR should ensure that the proposal would not impact on matters relating to the TSC Act.

## 4.5 State Environmental Planning Policies

### 4.5.1 State Environmental Planning Policy (State & Regional Development) 2011

*State Environmental Planning Policy (State & Regional Development) 2011* aims to identify development that is State Significant Development, State Significant Infrastructure and critical State Significant Infrastructure, and to confer functions on joint regional planning panels to determine development applications. SEPP (State & Regional Development) came into force following the repeal of Part 3A of the EP&A Act and applies to certain development declared to be State Significant Development.

The Tallawarra Lands Concept Approval was issued under Part 3A of the EP&A Act and continues to operate as a transitional Part 3A project under Schedule 6A of the Act. Therefore, the provisions of SEPP (State & Regional Development) do not apply to the modification application.

### 4.5.2 State Environmental Planning Policy (Infrastructure) 2007

*State Environmental Planning Policy (Infrastructure) 2007* (ISEPP) is designed to regulate development and activities related to the provision and maintenance of infrastructure. Under Section 104 of ISEPP, development proposals may require referral to RMS due to its traffic generation and potential impacts on the road network.

The modification does not seek approval for any infrastructure works and/or traffic generating development as outlined in Schedule 3 of the ISEPP, and therefore the State Environmental Planning Policy (SEPP) is not applicable. The provisions of ISEPP will be a consideration for future stages of the project.

Notwithstanding, in relation to Section 104 – Traffic Generating Developments, the Traffic Impact Assessment prepared by Cardno (2017e) (**Appendix D**) provides commentary on the RTA's "Guide to Traffic Generating Development".

### 4.5.3 State Environmental Planning Policy No. 14 – Coastal Wetlands

*State Environmental Planning Policy No 14 - Coastal Wetlands* (SEPP 14) aims to ensure that coastal wetlands are preserved and protected in the environmental and economic interests of the State. Works including clearing, construction of a levee, draining and filling cannot be undertaken except with the consent of the Council and the concurrence of the Director.

Two SEPP 14 wetlands are located on the subject site. One is located on the southern side of Duck Creek and the other in the south-eastern part of the site on the northern foreshore area to Haywards Bay.

The proposed modification relates only to land north of Yallah Bay Road and will not impact on either of the SEPP 14 Wetlands. Accordingly, the Modification is considered to be consistent with the SEPP.

### 4.5.4 State Environmental Planning Policy No. 55 – Remediation of Land

*State Environmental Planning Policy No 55 – Remediation of Land* (SEPP 55) provides a State-wide approach to the remediation of contaminated land, with the aim of promoting the remediation of contaminated land for the purpose of reducing the risk of harm to human health or any other aspect of the environment. Clause 6 of SEPP 55 provides guidelines to be considered by the planning authority when determining rezoning proposals.

> *(1) In preparing an environmental planning instrument, a planning authority is not to include in a particular zone (within the meaning of the instrument) any land specified in subclause (4) if the inclusion of the land in that zone would permit a change of use of the land, unless:*
>
> *(a) the planning authority has considered whether the land is contaminated, and*
>
> *(b) if the land is contaminated, the planning authority is satisfied that the land is suitable in its contaminated state (or will be suitable, after remediation) for all the purposes for which land in the zone concerned is permitted to be used, and*
>
> (c) *if the land requires remediation to be made suitable for any purpose for which land in that zone is permitted to be used, the planning authority is satisfied that the land will be so remediated before the land is used for that purpose*

The site has historically been subject to a number of environmental assessments relating to contamination that includes but is not limited to:

> Register of Hazardous Materials Report, Residences in North Shore Precinct, Tallawarra Lands, March 2011, Coffey Environments / Coffey Geotechnics

> Environmental Assessment Report, Tallawarra Lands Part 3A Concept Plan Application, August 2011, DFP Planning Consultants

> Geotechnical, Contamination and Groundwater Investigation, Tallawarra Lands, December 2010, Coffey Environments / Coffey Geotechnics

Intrusive sampling undertaken during the historical environmental assessments listed above did not include sampling and analysis of soil or groundwater within the footprint of the proposed North Shore Precinct and Central Precinct modification areas of the Tallawarra Lands development. Sampling within these areas was completed during an environmental assessment undertaken by Cardno (2017c). Remediation of land within the modification areas is unlikely to be required based on the Cardno (2017c) assessment, however the requirement for remediation will be determined by the site auditor accredited under the Contaminated Land Management Act 1997, Marc Salmon of Easterly Point Environmental Pty Ltd.

### 4.5.5 State Environmental Planning Policy No. 65 – Design Quality of Residential Apartment Development

*State Environmental Planning Policy No 65 – Design Quality of Residential Apartment Development* (SEPP65) applies to development proposals for residential flat buildings, shop top housing and/or mixed use development with a residential accommodation component. The Modification does not seek approval for any residential flat buildings and therefore SEPP 65 does now apply.

The Modification may facilitate residential flat buildings, shop top housing and/or mixed use developments as future land uses, however, these will be subject to future applications that will be subject to SEPP 65. The Apartment Design Guide however requires that site specific planning should occur at the master planning stage to ensure that appropriate outcomes can be achieved. This process has been undertaken in respect to the lots proposed for future development of apartment style buildings.

#### *4.5.5.1 Apartment Design Guide*

The Apartment Design Guide provides consistent planning and design standards for apartments across NSW. It provides design criteria and general guidance about how development proposals can achieve the nine design quality principles identified in SEPP 65.

Part 1 of the Apartment Design Guide seeks to inform appropriate site, block and building design responses for apartment buildings at a strategic level. It outlines the importance of understanding the context, setting, local character, size and configuration of a development site.

The Modification identifies a number of sites for residential apartment buildings and seeks to increase building heights and floor space ratios to facilitate an appropriate built form. The siting and scale of the proposed apartment buildings were informed by a detailed analysis of the context, setting and character of the site and surrounding areas.

The apartment buildings are proposed to be located in high amenity, foreshore areas. The maximum building height of 15m (4 storeys) and FSR of 1.5:1 will facilitate a built form that is appropriate in this foreshore location and consistent with the desired future character of the North Shore Precinct.

### 4.5.6 State Environmental Planning Policy No. 71 – Coastal Protection

*State Environmental Planning Policy 71 – Coastal Protection* (SEPP 71) is aimed at protecting the NSW coast, ensuring the public have access to the waterfront, maintaining amenity and protecting environmentally and culturally significant aspects.

The site is located within the 'coastal zone' as defined by SEPP 71. Clause 8 details the matters for consideration when determining a draft LEP or DA, with a review of the matters for consideration undertaken in **Table 4-1** below.

**Table 4-1 SEPP 71 – Matters for Consideration**

| Matters for Consideration (Clause 8 of SEPP 71) | Comment |
|---|---|
| a) *the aims of this Policy set out in clause 2 [of SEPP 71]* | The proposed modification is not contrary to any of SEPP 71 aims as there are no impacts on coastal access or the coastal environment. The future development of the site (subject to separate application) will be consistent with the aims of SEPP 71 in that the overall Concept Approval seeks to:<br>▪ protect and manage natural areas within the site<br>▪ improve public access to the foreshore<br>▪ incorporate Aboriginal Cultural Heritage interpretative measures<br>▪ protect the visual amenity of the coast<br>▪ implement water quality measures to protect the coastal environment<br>▪ protect and enhance coastal vegetation. |
| b) *existing public access to and along the coastal foreshore for pedestrians or persons with a disability should be retained and, where possible, public access to and along the coastal foreshore for pedestrians or persons with a disability should be improved* | The proposed modification will not impact on existing access along the foreshore. However, future development of the site (subject to future applications) will provide significantly improved access along the foreshore for pedestrians and persons with a disability. |
| c) *opportunities to provide new public access to and along the coastal foreshore for pedestrians or persons with a disability* | The proposed modification will not impact on existing access along the foreshore. However, future development of the site (subject to future applications) will provide significantly improved |

| Matters for Consideration (Clause 8 of SEPP 71) | Comment |
|---|---|
| | access along the foreshore for pedestrians and persons with a disability. |
| d) *the suitability of development given its type, location and design and its relationship with the surrounding area* | The proposed modification seeks only minor amendments to an already approved concept plan for the site. The proposed changes seek to facilitate a greater mix of densities and housing types to meet the changing housing needs of the community, and is considered appropriate for this location. |
| e) *any detrimental impact that development may have on the amenity of the coastal foreshore, including any significant overshadowing of the coastal foreshore and any significant loss of views from a public place to the coastal foreshore* | The proposed development is set well back from the Lake Illawarra foreshore minimising visual impacts and avoiding overshadowing impacts.<br>The proposed modification seeks to increase building heights in certain areas up to 4 storeys, however, this is unlikely to create overshadowing of the foreshore given the significant setbacks from the water and the foreshore being predominately north facing.<br>The provision of significant foreshore areas in the Concept Plan ensures that views to the foreshore and the Lake from future public places will be available. |
| f) *the scenic qualities of the New South Wales coast, and means to protect and improve these qualities* | The majority of the proposed development area is substantially set back from the foreshore and the provision of significant foreshore areas in the Concept Plan protects and enhances the scenic qualities of the coastal areas of the lake.<br>A Visual Impact Assessment has been prepared by Cardno (2017d) to support the modification (**Appendix K**). The assessment examined the visual aspects of future development on the slopes of Mt Brown that will be visible from the Lake and other foreshore areas. The impacts were found to be acceptable and similar to the surrounding built form context.<br>The Cardno (2017d) assessment recommended a number of built form and landscape controls be implemented to minimise the visual impact of the proposed development. |
| g) *measures to conserve animals (within the meaning of the Threatened Species Conservation Act 1995) and plants (within the meaning of that Act), and their habitats* | Ecoplanning prepared BAR in accordance with the SEARs. Direct impacts to the ecological values of the development site are limited, as a majority of the development is associated with cleared land. However, direct impacts will occur to small areas of native vegetation. The total impact to native vegetation within the subject site is 4.24 ha, and appropriate avoidance, mitigation and offset measures are identified in the BAR.<br>The implementation of the environmental safeguards identified in the BAR will ensure that the proposal is consistent with the objectives of the TSC Act. |
| h) *measures to conserve fish (within the meaning of Part 7A of the Fisheries Management Act 1994) and marine vegetation (within the meaning of that Part), and their habitats* | The stormwater system has been designed to ensure that the water quality leaving the development site is appropriately treated to ensure no impact to fisheries habitat located adjacent to the site. The Flood Risk Assessment contained at **Appendix E** contains details relating to the Water Quality and Water Sensitive Urban Design measures that will be employed throughout the development site. |
| i) *existing wildlife corridors and the impact of development on these corridors* | Wildlife corridors were considered and addressed by Ecoplanning as part of the BAR (**Appendix G**). The subject site is generally poorly connected, and the |

| Matters for Consideration (Clause 8 of SEPP 71) | Comment |
|---|---|
| | site is at the end of a corridor, rather than providing connectivity itself.<br>Only a small area of native vegetation is to be impacted and no impacts to connectivity are expected. This includes no changes to either the minimum width, or the overall condition of the corridor. |
| *j) the likely impact of coastal processes and coastal hazards on development and any likely impacts of development on coastal processes and coastal hazards* | The proposal site and associated modifications will not impact on the coastal environment. All works will take place above the high water mark, with all discharges from the site being appropriately treated before leaving the site boundaries. |
| *k) measures to reduce the potential for conflict between land-based and water-based coastal activities* | The proposed modification maintains the separation between the land based (developable areas) and potential water based activities so as to avoid conflicts between these land uses. |
| *l) measures to protect the cultural places, values, customs, beliefs and traditional knowledge of Aboriginals* | Biosis (2017b and 2017c) prepared an Aboriginal Cultural Heritage Archaeological Report for both the North Shore and Central precincts (**Appendix M** and **Appendix N**). The proposed modification does not include any physical works on site, and therefore, no additional assessment is required at this time. However, subsurface investigations (test excavations) will be required for areas identified as having high and moderate archaeological potential as part of future development applications over the site. Measures to protect the cultural places, values, customs, beliefs and traditional knowledge of Aboriginals will be considered as part of future application over the site. |
| *m) likely impacts of development on the water quality of coastal waterbodies* | All rain water runoff from the development site will be appropriately treated by the proposed stormwater management system to effectively treat any pollutants that might be contained within this run off. The measures proposed are detailed within the Flood Risk Assessment (**Appendix E**) and the Water Cycle Management Study undertaken for the Approved Concept Plan. |
| *n) the conservation and preservation of items of heritage, archaeological or historic significance* | Biosis (2017a) prepared a Heritage Impact Assessment (HIA) (**Appendix L**) to assess the impact to adjacent heritage items along with identified heritage values within the study area including landscape features, built items and areas of archaeological potential.<br>The site was identified as containing a potential heritage item and three areas of suspected archaeological potential. However, the HIA determined that there was no heritage significance and a low level of archaeological potential; and that no further assessment / management was required. |
| *o) only in cases in which a council prepares a draft local environmental plan that applies to land to which this Policy applies, the means to encourage compact towns and cities* | The proposed modification seeks to slightly increase the residential zoned land in an area that is contiguous with the existing residential zoned land. The proposal also seeks to increase residential densities throughout the site, to increase the residential yield and encourage a compact urban area. |
| *p) only in cases in which a development application in relation to proposed development is determined:*<br>*i. the cumulative impacts of the proposed development on the environment, and* | The Tallawarra Lands site has an existing Concept Approval which has identified areas of the site suitable for future development and those areas which are to be protected as environmental management or conservation areas. |

| Matters for Consideration (Clause 8 of SEPP 71) | Comment |
|---|---|
| *ii. measures to ensure that water and energy usage by the proposed development is efficient.* | The proposed modification seeks to slightly amend the zone boundaries into the redundant areas of the former Coal Fired Power Station buffer.<br>The modification retains significant environmental areas and will minimise potential cumulative impacts.<br>Improvements to the natural environments are also proposed particularly to the riparian corridors and the future installation of Water Sensitive Urban Design (WSUD) measures will improve water quality. These measures are discussed in the specialist reports supporting the modification application. |

The review of the SEPP 71 matters for consideration illustrates that the modification would not have any impact on the coast of NSW.

#### *4.5.6.2 Coastal Design Guidelines for NSW*

The Coastal Design Guidelines for NSW provide design guidance on coastal developments and redevelopments to ensure they are sensitive to the unique natural and urban settings of coastal areas. Part 2 of the Guidelines sets out design principles for coastal settlements which are addressed in **Table 4-2** below.

**Table 4-2 Coastal Design Guidelines for NSW Design Principles**

| Design Principe | Comment |
|---|---|
| *Defining the Footprint and Boundary* | The Guidelines discourage coastal settlements from expanding into foreshore and bushland areas in an ad hoc way. The proposed modification seeks to take a more strategic approach to defining the urban footprint, prior to the site being developed. The proposed expansion of the urban area is informed by a detailed assessment of the environmental impacts and appropriate mitigation measures to minimise effects on bushland and foreshore areas. |
| *Connecting Open Space* | The overall Concept Approval will facilitate a significantly improved foreshore open space that connects the North Shore and Central precincts with existing and proposed regional open space adjoining the site.<br>Open space areas have been identified to protect the natural attributes of the site and designed to create a connected open space network for the entire community. |
| *Protecting the Natural Edges* | The Guidelines seek to provide improved access to the NSW coast, and retail foreshore areas in public ownership for public recreational use.<br>The overall Concept Approval achieves this by maintaining the existing ownership arrangements for all foreshore areas in public ownership and significantly enhancing foreshore open space for public recreational use. |
| *Reinforcing the Street Pattern* | Yallah Bay Road is nominated as a collector road and provides the main spine road through the Concept Plan area. Each precinct contains a local street network that establishes a legible grid pattern and promotes views and access to the foreshore. |
| *Appropriate Buildings for a Coastal Context* | The proposed modification does not provide for any specific built form and this will be a consideration of future applications over the site.<br>The modification does propose to increase building heights in certain locations to 15m (4 storeys) with a FSR of 1.5:1. These development standards will |

| Design Principe | Comment |
|---|---|
| | facilitate a built form that is of an appropriate bulk and scale for a coastal location. |

The review of the Design Principles illustrates that the proposal is consistent with the Coastal Design Guidelines for NSW.

### 4.5.7 Draft State Environmental Planning Policy (Coastal Management) 2016

The draft *State Environmental Planning Policy (Coastal Management) 2016* (Coastal Management SEPP) will consolidate and improve current coastal-related SEPPs. It will replace SEPP 14 (Coastal Wetlands), SEPP 26 (Littoral Rainforests) and SEPP 71 (Coastal Protection) and ensure that future coastal development is appropriate and sensitive to our coastal environment, and that we maintain public access to beaches and foreshore areas.

Consistency with SEPP 14 and SEPP 71 is discussed above. The proposed modification is consistent with the draft Coastal Management SEPP in that it maintains and improves public access to the foreshore while protecting the environmental assets of the coast.

## 4.6 Local Planning Context

### 4.6.1 Wollongong Local Environmental Plan 2009

The Wollongong Local Environmental Plan 2009 (WLEP) applies to land within the Wollongong LGA and regulates development through a set of land use zones and development standards. The subject site is zoned for a mix of industrial, business, residential and environmental protection uses, and WLEP establishes a set of key development standards over the site including:

> A maximum height of building of 9m for residential and business zoned land

> A maximum height of building of 16m for land zoned IN2 Light Industrial and 20m for land zone IN1 General Industrial

> A maximum floor space ratio of 0.5:1 for all residential and industrial zoned land

> A maximum floor space ration of 0.75:1 for business zoned land.

The site is also mapped as an Urban Release Area and is therefore subject to Part 6 of WLEP. Part 6 of WLEP establishes satisfactory arrangements provisions for the provision of State and regional infrastructure, as well as the requirement for a Development Control Plan (DCP) to be prepared prior to the site being developed.

While the proposal is generally consistent with aims, objectives and provisions of WLEP, the modification seeks to make a number of amendments to the WLEP to facilitate the proposed development scheme. The proposed amendments include:

> Realigning the residential zone boundaries in both the North Shore and Central precincts (see **Figure 4-3** and **Figure 4-4**)

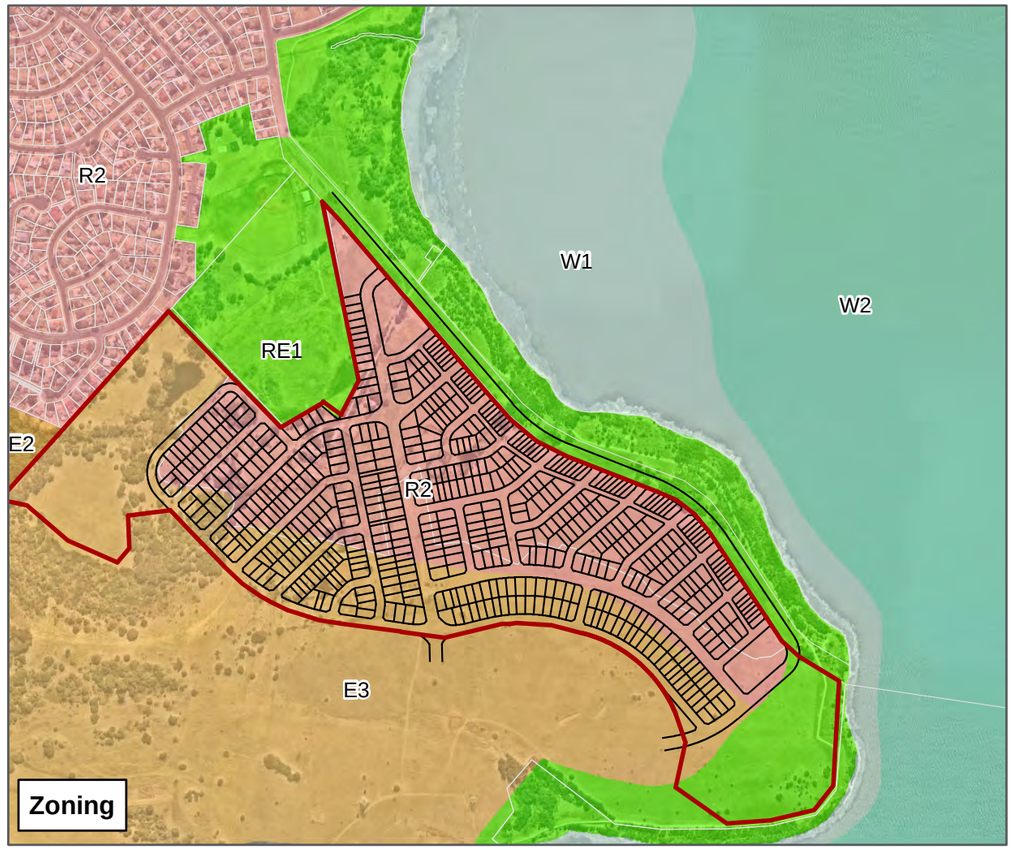
> Realigning the IN2 Light Industrial zone boundary to increase employment lands (see **Figure 4-3** and **Figure 4-4**)

> A reduction in the minimum lot size within the R2 zoned land to facilitate a diversity in lot sizes and housing types (see **Figure 4-3** and **Figure 4-4**)

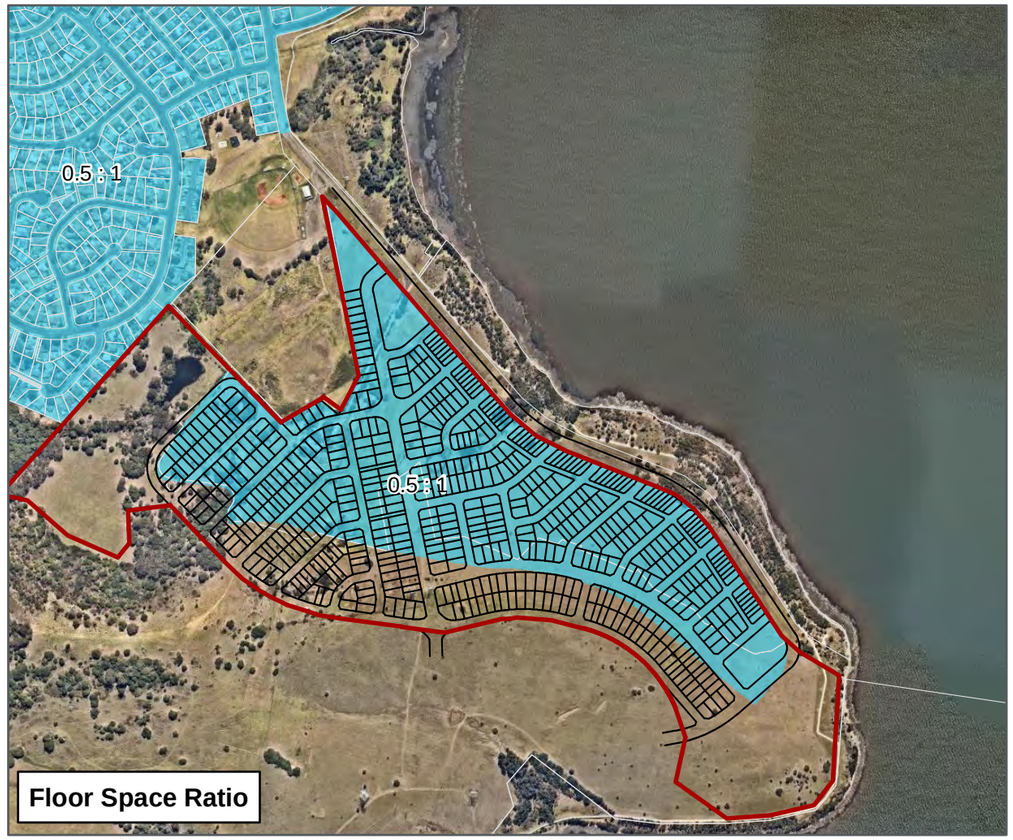
> An increase in the maximum height of building in certain areas to allow for residential apartment buildings and provide a greater mix of housing types (see **Figure 4-3** and **Figure 4-4**)

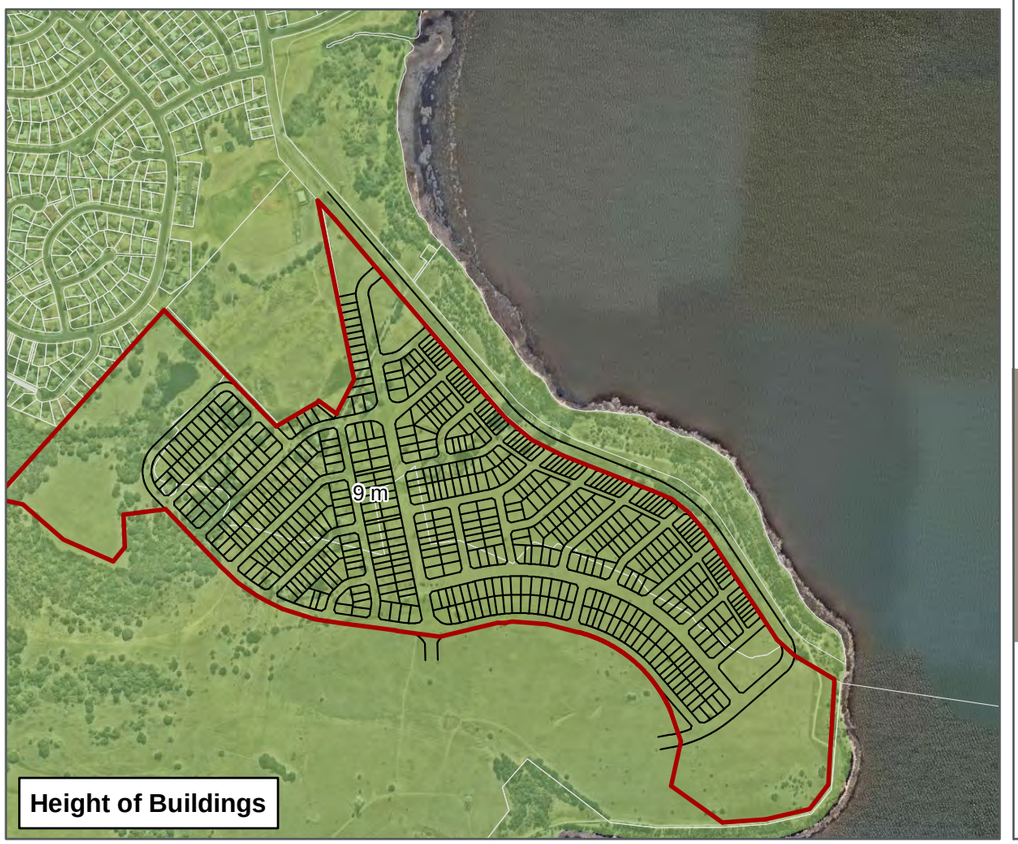
> An increase in the FSR in certain areas (see **Figure 4-3** and **Figure 4-4**)

The proposed amendments to WLEP primarily seek to increase the density of development across the site by amending zone boundaries and minimum lot sizes to meet the changing housing needs of the community. The proposed changes are discussed in more detail in **Section 3.2**.








BRIDGEHILL

# Existing LEP Planning Controls

NORTH SHORE PRECINCT
TALLAWARRA LANDS

## Legend

- Proposed Superlot Boundary
- Proposed Lot Layout
- Cadastre (DFSI-SS, 2017)

**Wollongong LEP 2009 (DPE, December 2016)**

**Zoning**

- E2 Environmental Conservation
- E3 Environmental Management
- R2 Low Density Residential
- RE1 Public Recreation
- W1 Natural Waterways
- W2 Recreational Waterways

**Maximum Floor Space Ratio (n:1)**

- 0.5

**Maximum Building Height (m)**

- 9m

**Minimum Lot Size**

- 449 $m^2$
- 39.99 ha

**FIGURE 4-1**

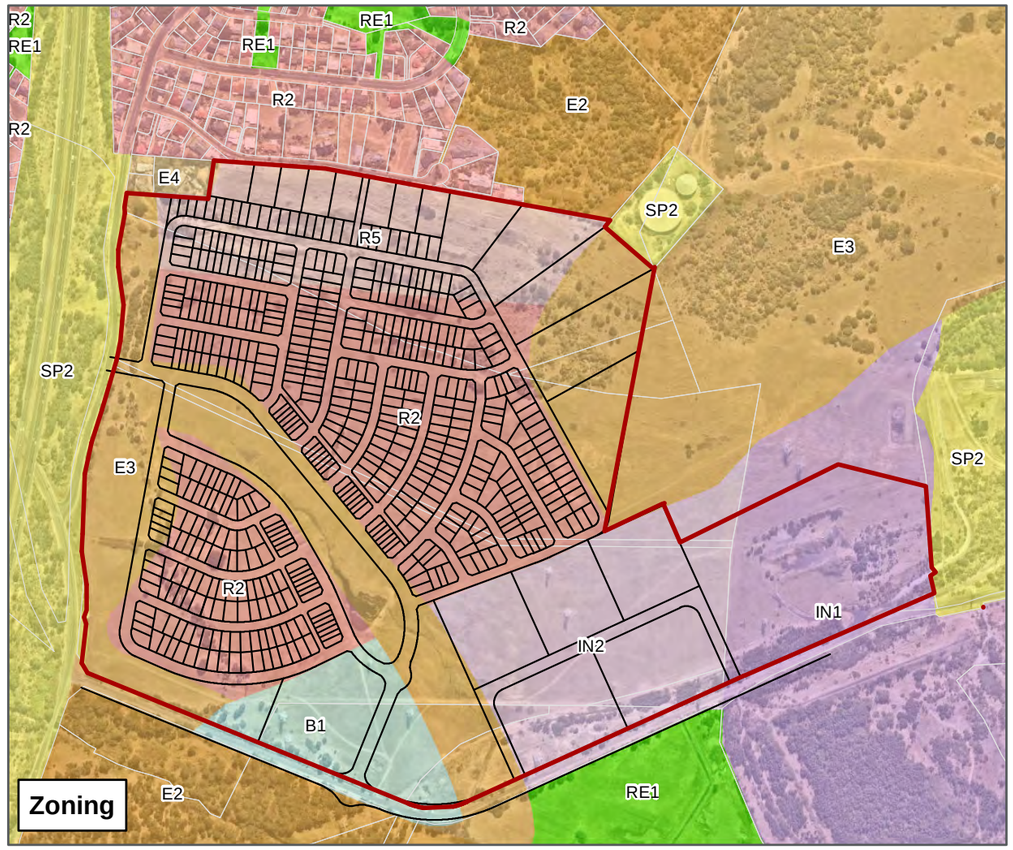
**1:10,000 Scale at A3**

Metres
0 100 200 300 400

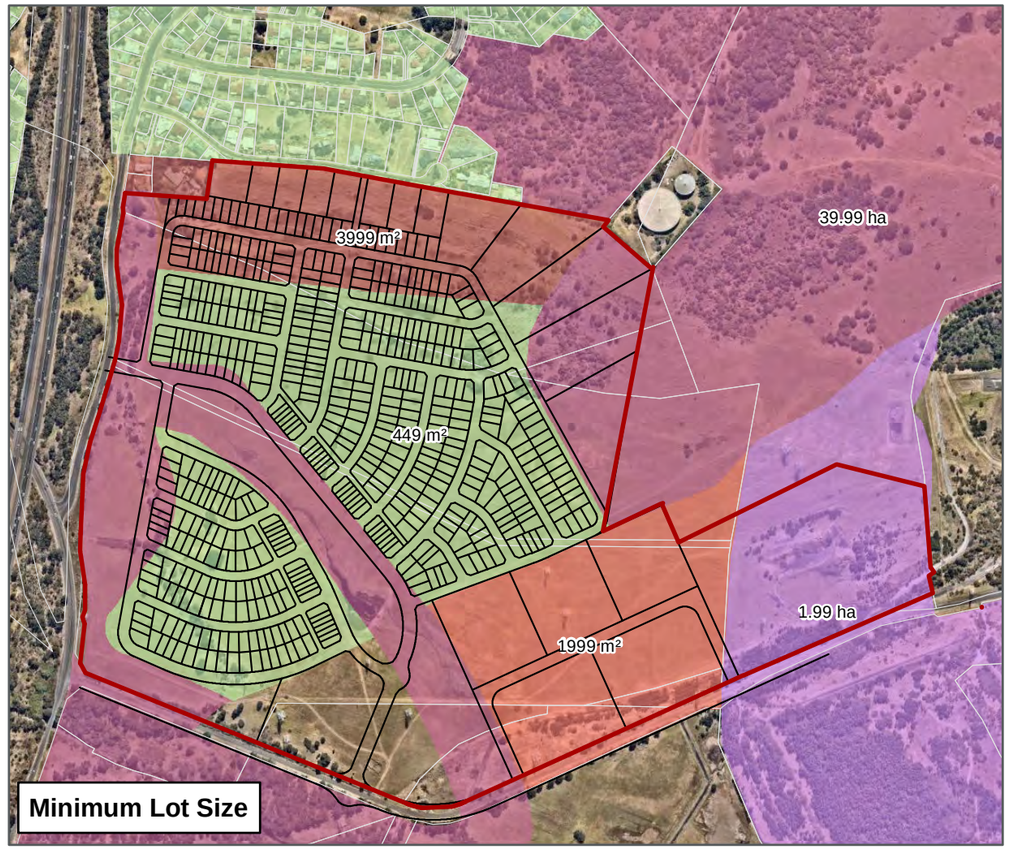
N

Cardno

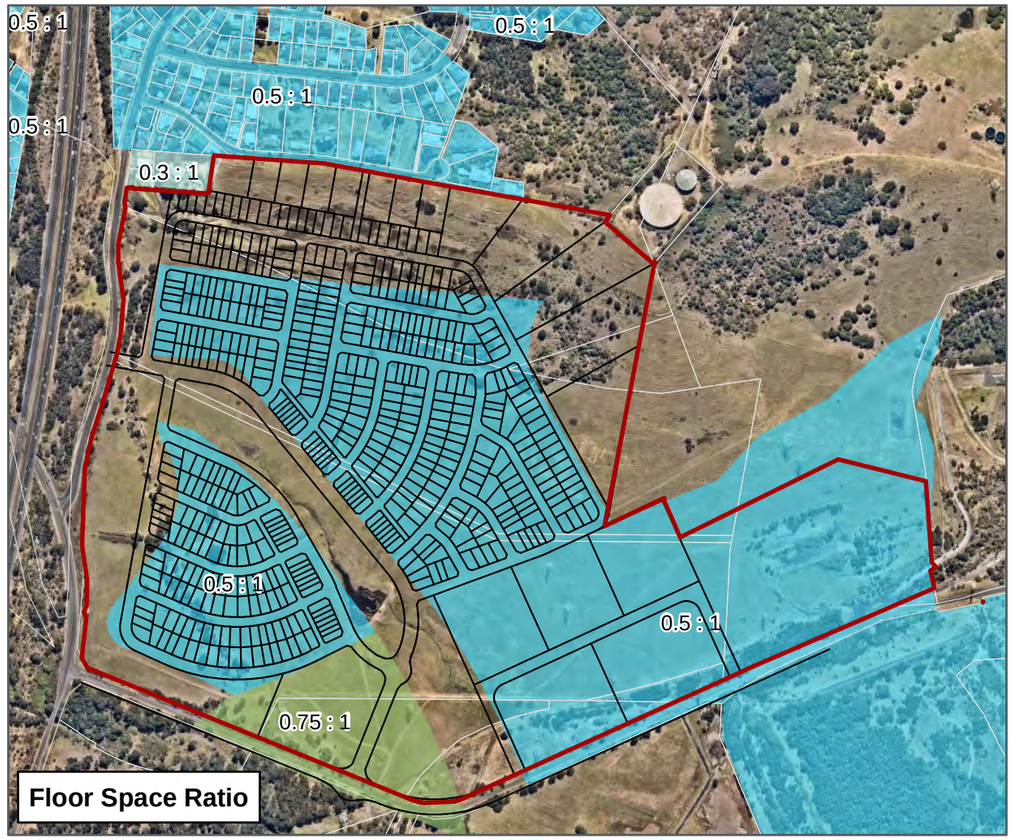
Map Produced by Cardno NSW/ACT Pty Ltd (WOL)
Date: 2017-10-27 | Project: 82017142
Coordinate System: GDA 1994 MGA Zone 56
Map: 82017142-01-GS-033-ExistingLEPControlNorth.mxd 01
Aerial imagery supplied by nearmap (October 2017)



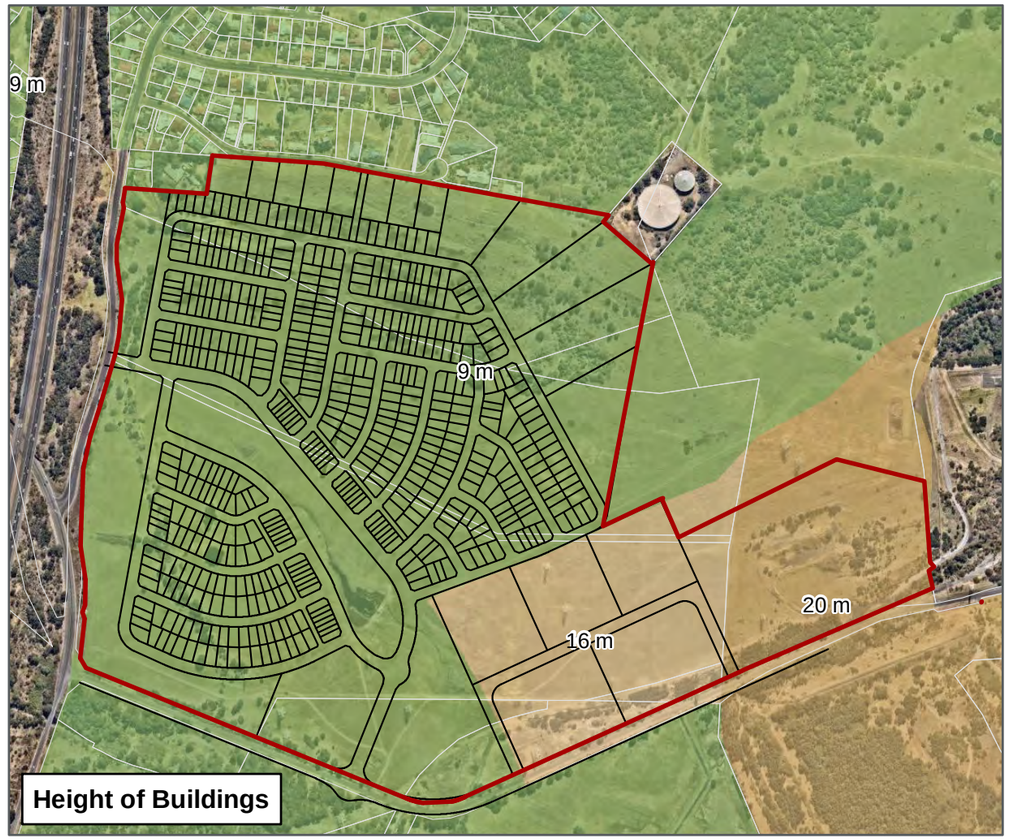

Zoning




Minimum Lot Size




Floor Space Ratio




Height of Buildings

BRIDGEHILL

# Existing LEP Planning Controls

## CENTRAL PRECINCT TALLAWARRA LANDS

### Legend

- Proposed Superlot Boundary
- Proposed Lot Layout
- Cadastre (DFSI-SS, 2017)

**Wollongong LEP 2009 (DPE, March 2017)**

- B1 Neighbourhood Centre
- E2 Environmental Conservation
- E3 Environmental Management
- E4 Environmental Living
- IN1 General Industrial
- IN2 Light Industrial
- R2 Low Density Residential
- R5 Large Lot Residential
- RE1 Public Recreation
- SP2 Infrastructure

**Maximum Floor Space Ratio (n:1)**

- 0.5
- 0.75

**Maximum Building Height (m)**

- 9m

**Minimum Lot Size - Wollongong LEP 2009 (DPE, May 2017)**

- 449 m²
- 1,999 m²
- 4,999 m²
- 1 - 1.9 ha
- 49.9 ha

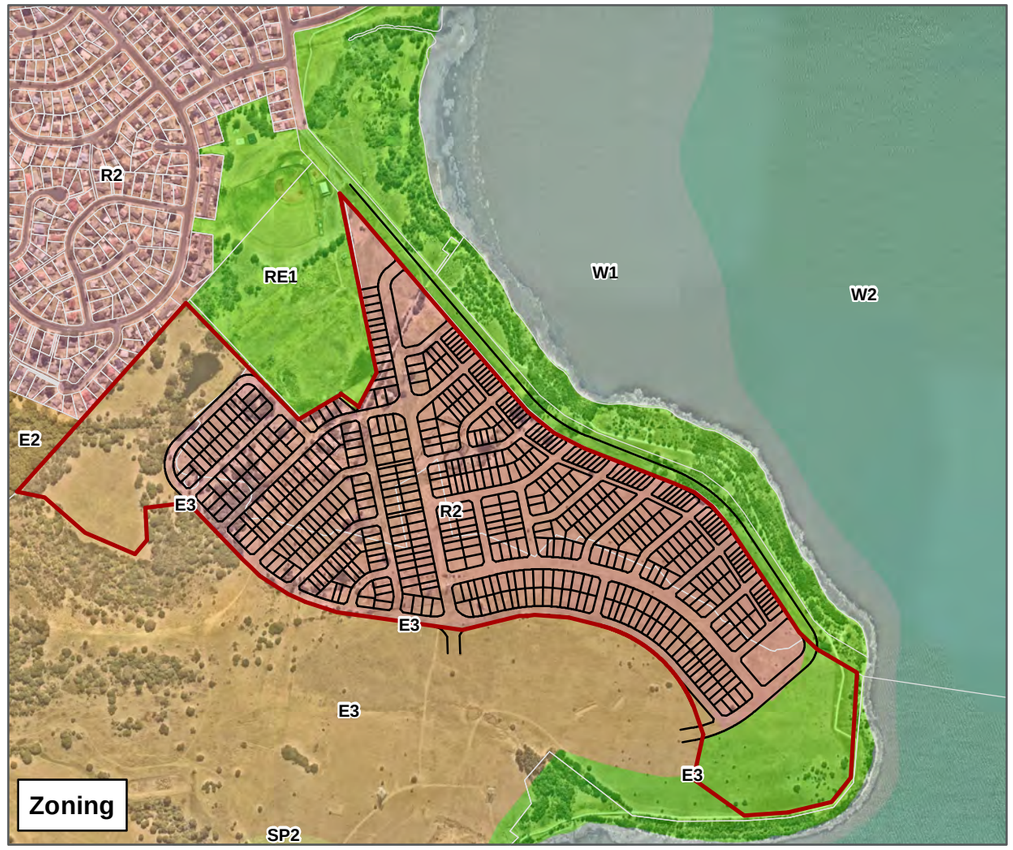
**FIGURE 4-3**

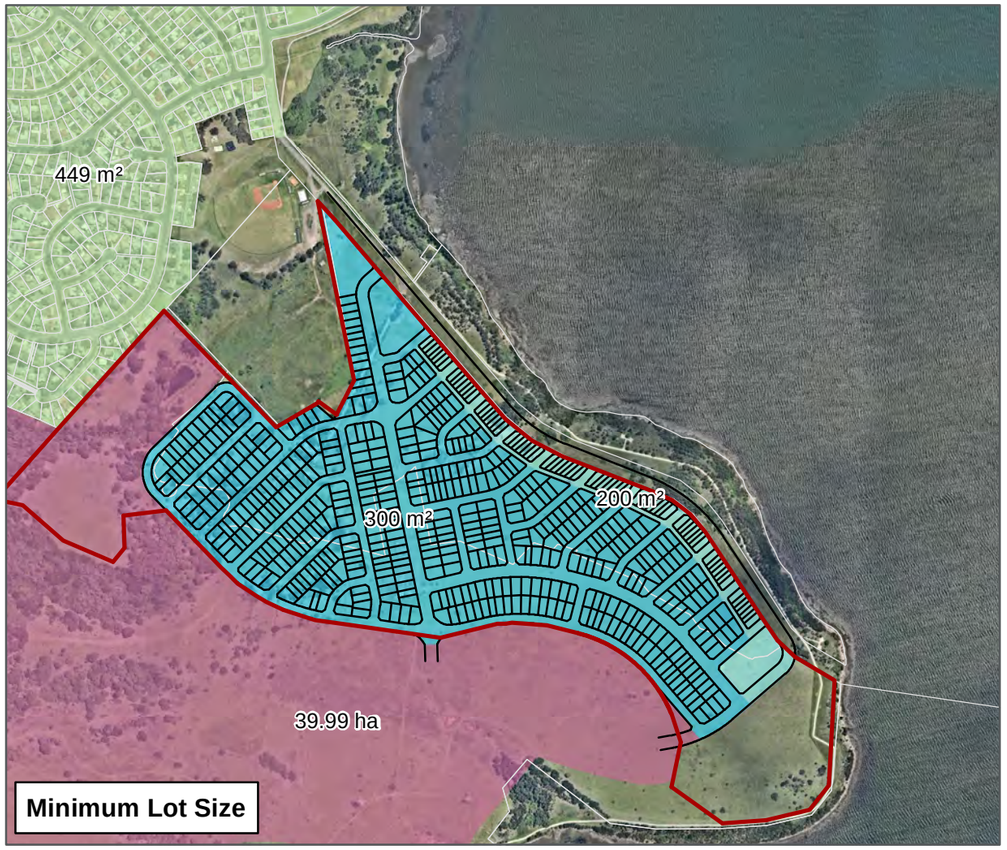
**1:9,000 Scale at A3**

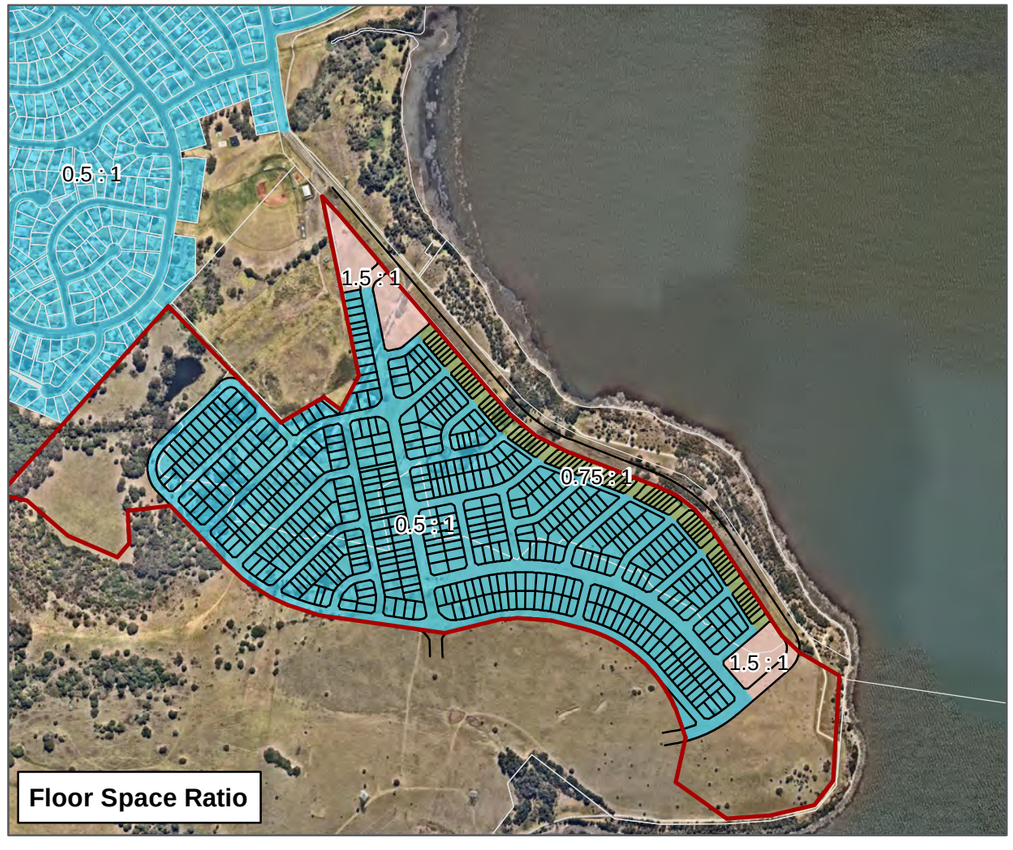
Metres
0 100 200 300 400

Cardno

Map Produced by Cardno NSW/ACT Pty Ltd (WOL)
Date: 2017-10-27 | Project: 82017142
Coordinate System: GDA 1994 MGA Zone 56
Map: 82017142-01-GS-032-ExistingLEPControlCentral.mxd 01
Aerial imagery supplied by nearmap (October 2017)





# Proposed LEP Planning Controls

**NORTH SHORE PRECINCT**
**TALLAWARRA LANDS**

## Legend

- Proposed Superlot Boundary
- Proposed Lot Layout
- Cadastre (DFSI-SS, 2017)

### Proposed Zoning

- E2 Environmental Conservation
- E3 Environmental Management
- R2 Low Density Residential
- RE1 Public Recreation
- SP2 Infrastructure
- W1 Natural Waterways
- W2 Recreational Waterways

### Proposed Maximum Floor Space Ratio (n:1)

- 0.5
- 0.75
- 1.5

### Proposed Maximum Building Height (m)

- 9m
- 15m

### Proposed Minimum Lot Size

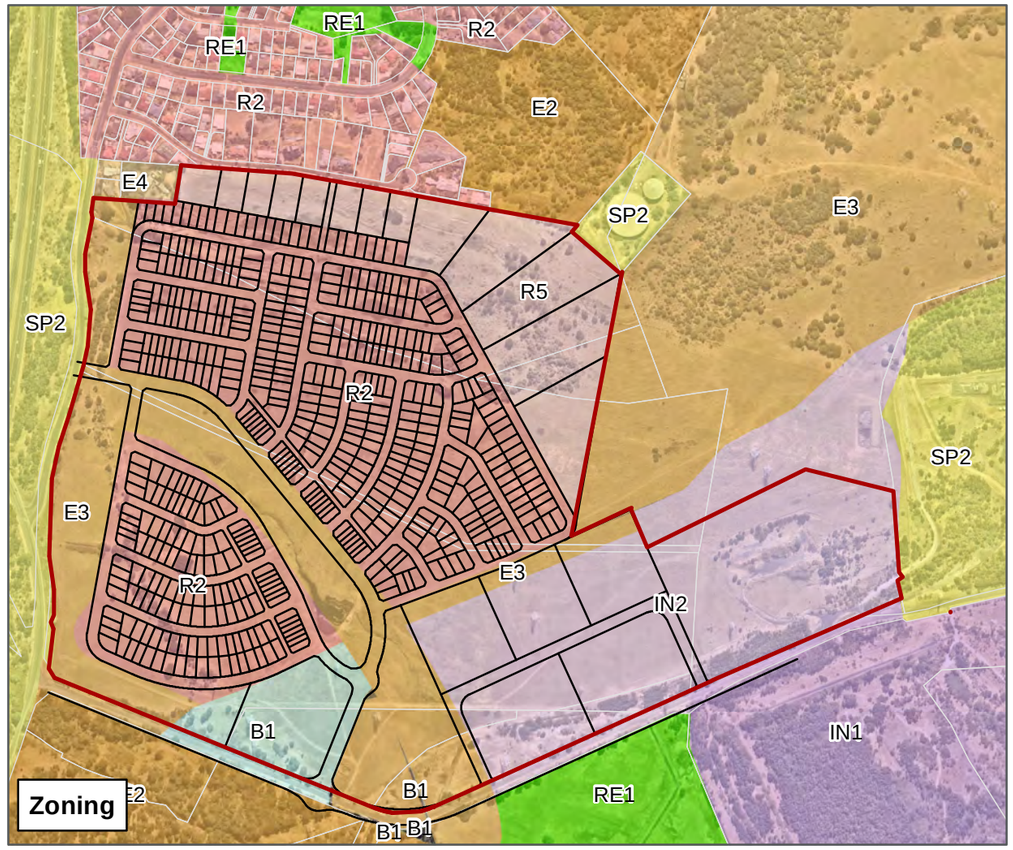
- 200 m²
- 300 m²
- 449 m²
- 39.99 ha

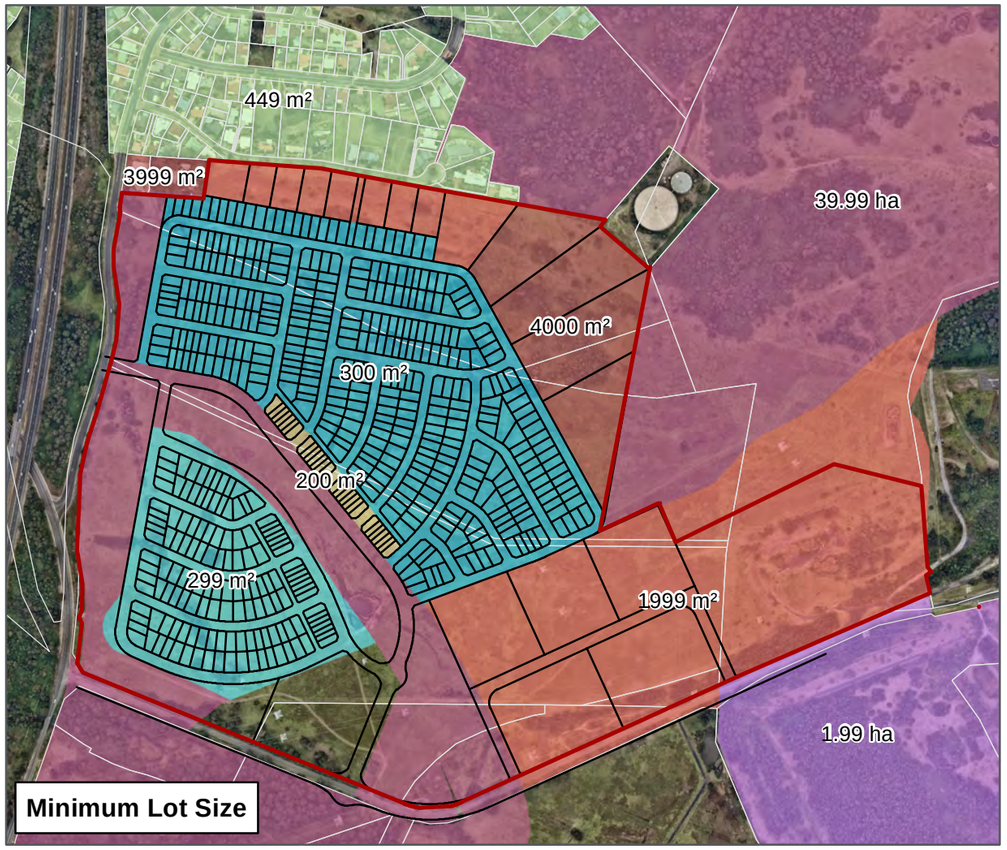
**FIGURE 4-2**

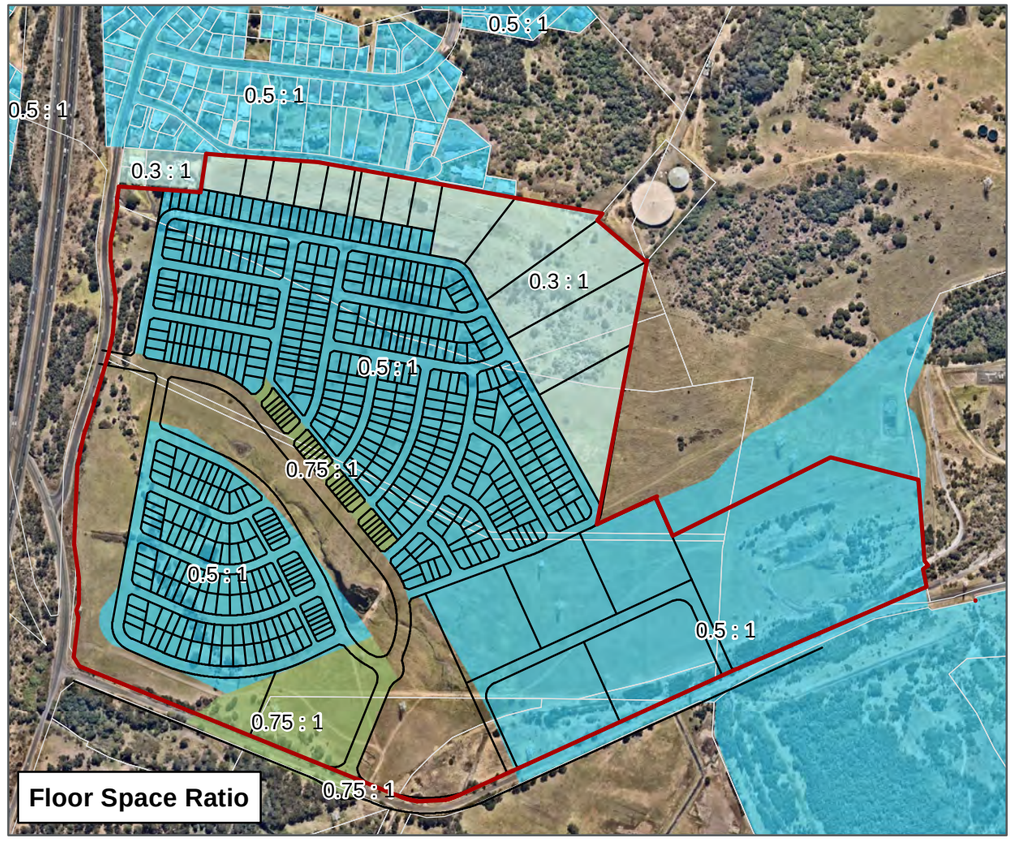
**1:10,000 Scale at A3**

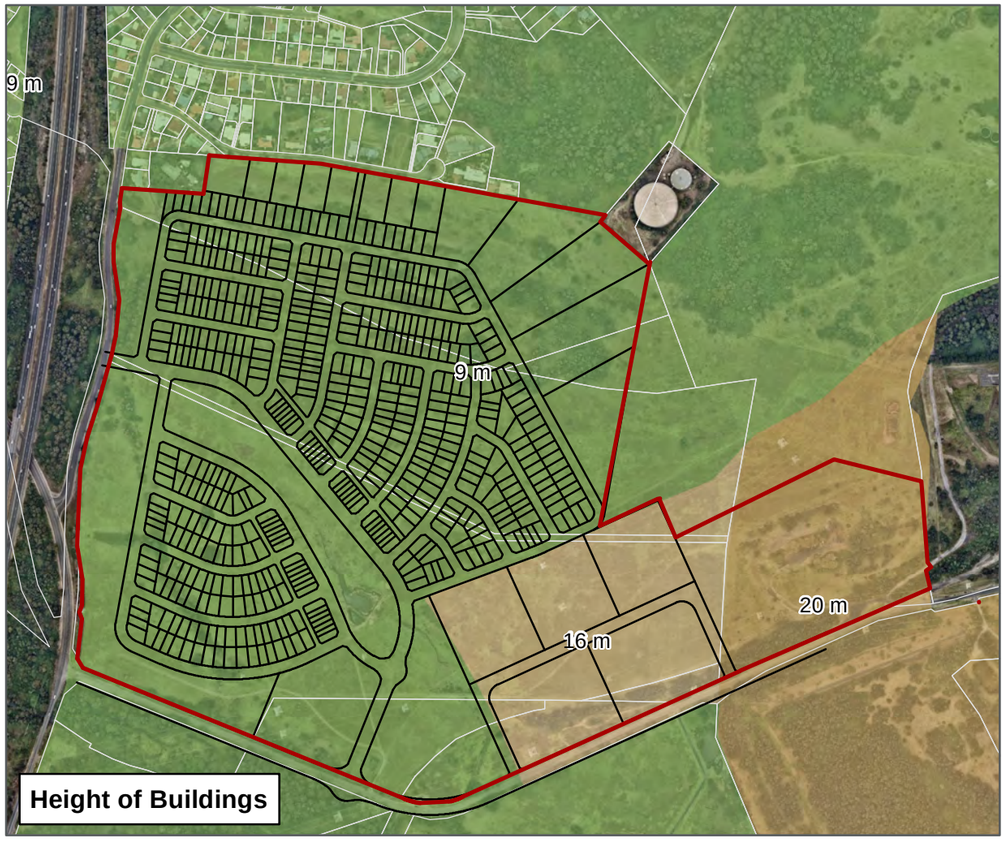
Metres
0 100 200 300 400

Map Produced by Cardno NSW/ACT Pty Ltd (WOL)
Date: 2018-03-23 | Project: 82017142
Coordinate System: GDA 1994 MGA Zone 56
Map: 82017142-01-GS-034-ProposedLEPControlNorth.mxd 01
Aerial imagery supplied by nearmap (October 2017)




# Proposed LEP Planning Controls

## CENTRAL PRECINCT TALLAWARRA LANDS

### Legend

- Proposed Superlot Boundary
- Proposed Lot Layout
- Cadastre (DFSI-SS, 2017)

**Proposed Zoning**

- B1 Neighbourhood Centre
- E2 Environmental Conservation
- E3 Environmental Management
- E4 Environmental Living
- IN1 General Industrial
- IN2 Light Industrial
- R2 Low Density Residential
- R5 Large Lot Residential
- RE1 Public Recreation
- SP2 Infrastructure

**Proposed Maximum Floor Space Ratio (n:1)**

- 0.5

**Proposed Maximum Building Height (m)**

- 9 m
- 16 m
- 20 m

**Proposed Minimum Lot Size**

- 299 m²
- 300 m²
- 449 m²
- 1,999 m²
- 3,999 m²
- 1.99 ha
- 39.99 ha

**FIGURE 4-4**

**1:9,000 Scale at A3**

Metres: 0 100 200 300 400

Map Produced by Cardno NSW/ACT Pty Ltd (WOL)
Date: 2018-05-31 | Project: 82017142
Coordinate System: GDA 1994 MGA Zone 56
Map: 82017142-01-GS-035-ProposedLEPControlCentral.mxd 01
Aerial imagery supplied by nearmap (October 2017)

### 4.6.2 Wollongong Development Control Plan 2009

Wollongong DCP provides detailed planning guidelines for developments within the Wollongong LGA. The DCP contains a number of chapters that apply to a range of land uses, types of developments and specific sites.

As the proposed modification only seeks to amend the planning provisions that relate to the subject land, and does not relate to the development of the site, the provisions of Wollongong DCP do not apply to the modification. However, future development of the site (under a separate application) will be subject to the provisions of Wollongong DCP.

The SEARs require a set of design guidelines to be prepared for the site, and incorporated as a chapter into Wollongong DCP. The site specific DCP will need to be completed prior to the First Future Development Application for the subdivision of the various precincts being determined. The DCP would be prepared in conjunction and subsequently assessed by Council to guide the future development of the site.

## 4.7 Strategic Planning Considerations

### 4.7.1 NSW 2021 – A Plan to Make NSW Number One

NSW 2021 – A Plan to Make NSW Number One is the State Governments strategic business plan, setting priorities for action and guiding resource allocation across NSW. The Plan sets a number of key objectives and goals to drive the economy, improve services and infrastructure and strengthen local environments and communities. The key goals that relate to the site are:

> *Drive economic growth in regional NSW*
>
> *Protect our natural environment*

The Tallawarra Lands site is an important site for the long term economic growth of the Illawarra region. The proposed modification maintains all employment lands and seeks to increase the total area of industrial and residential zoned land across the site. Appropriate mitigation measures have been identified to minimise any impact on the natural environment.

### 4.7.2 Illawarra-Shoalhaven Regional Plan

The Illawarra-Shoalhaven Regional Plan applies to the local government areas of Wollongong, Shellharbour, Kiama and Shoalhaven and provides the strategic policy, planning and decision-making framework to guide the region to sustainable growth over the next 20 years. The Regional Plan is underpinned by a number of key principles that seek to integrate economic, social and environmental considerations to achieve ecologically sustainable growth for the region.

The principles most relevant to this Modification include:

> *Identify and protect land with high environmental value and recognise cultural heritage values*
>
> *support a strong, resilient and diversified economy that will enable the community to respond to environmental, economic and social challenges*
>
> *take a balanced approach to housing that provides choice, affordability, and supports the orderly supply of land for development*

The subject land is an identified growth area in the Regional Plan and the Modification seeks to implement the principles and directions of the Plan by protecting lands with high environmental values, maintaining employment generating lands and providing a greater diversity in housing types to meet the changing needs of the community. Specifically, the Modification seeks to increase residential densities in appropriate locations to facilitate a mix of housing types including traditional houses on individual blocks, smaller and low maintenance houses, terraces and residential flat buildings to better meet the future housing demands of the community.

## 4.8 Guidelines

### 4.8.1 National Airports Safeguarding Framework

The National Airports Safeguarding Framework is a national land use planning framework that aims to improve community amenity by minimising aircraft noise-sensitive developments near airports; and improve safety outcomes by ensuring aviation safety requirements are recognised in land use planning decisions.

The proposed modification does not include any physical works on site, it seeks to refine zone boundaries in an area already zoned for residential development. The National Airports Safeguarding Framework will be considered in future development applications over the site.

### 4.8.2 Lake Illawarra Floodplain Risk Management Study 2012

The Lake Illawarra Floodplain Risk Management Study 2012 identifies and assesses options and actions that could be implemented to manage the flood risk for the Lake Illawarra foreshore. The proposed modification relates only to land north of Yallah Bay Road which is primarily not flood affected. The proposed modification will not impact on any of the floodplain risk management measures outlined in the study.

### 4.8.3 Riparian Corridor Management Study 2004

The Riparian Corridor Management Study seeks to map and assign environmental objectives to watercourses within the Wollongong LGA and Calderwood Valley. The study identifies three categories of riparian land to reflect the relative importance of a watercourse.

Duck Creek is mapped as a Category 1 watercourse and the study seeks to provide a continuous corridor width for flora and fauna movement, provide extensive habitat, maintain the viability of native vegetation and manage edge effects associated with urban development. The proposal relates to land wholly outside of the Duck Creek riparian corridor (zoned E2 Environmental Management) and will not impact on the terrestrial and aquatic habitat of Duck Creek.

There are a number of Category 2 and 3 riparian corridors that traverse the site, and appropriate buffers and water quality measures are in place to achieve the objectives of the Riparian Corridor Management Study.

### 4.8.4 NSW Wetland Management Policy 2010

The NSW Wetland Management Policy 2010 promotes the management of the wetlands of NSW to protect wetland vegetation, water quality, natural productivity and biological diversity and natural flood mitigation. The Policy sets out a range of principles to guide the decision-making by Government agencies in activities affecting wetlands.

There are two SEPP 14 wetlands located on the subject site on the southern side of Duck Creek and the south-eastern part of the site on the northern foreshore area towards Haywards Bay. The proposed modification relates only to land north of Yallah Bay Road and will not impact on either of the SEPP 14 wetlands. Accordingly, the NSW Wetland Policy 2010 in not considered relevant to the proposed modification. Future development to the south of Yallah Bay Road will need to consider the principles of the NSW Wetland Policy 2010.

### 4.8.5 RMS Guide to Traffic Generating Developments

The RTA Guide to Traffic Generating Development outlines all aspects of traffic generation considerations relating to developments. The Guide provides information regarding traffic issues for the preparation and assessment of Development Applications.

The Traffic Impact Assessment prepared by Cardno (2017e) (**Appendix D**) provides commentary on the RTA Guide to Traffic Generating Development.

### 4.8.6 AUSTROADS Guidelines

Austroads publishes a range of guidelines that cover the design, construction, maintenance and operation of the road network in Australia and New Zealand.

The Traffic Impact Assessment prepared by Cardno (2017e) (**Appendix D**) was prepared in accordance with the Austroads Guidelines.

### 4.8.7 NSW Bicycling Guidelines

The NSW Bicycling Guidelines assist road designers, planners and engineers to design and construct high-quality bicycle transport facilities and provide technical guidance on a range of conditions. The proposed modification does not propose any physical works and the NSW Bicycling Guidelines will be a consideration for future development applications over the site.

### 4.8.8 NSW Planning Guidelines for Walking and Cycling

The NSW Planning Guidelines for Walking and Cycling seek to improve the consideration of walking and cycling in the planning and design of places. The Guidelines identify a number of principles to create more pedestrian and cycle friendly neighbourhoods, including connected street patterns, public transport stops, and open space corridors to reinforce local walking and cycling networks and create a safe and comfortable walking and cycling environment.

The modification to the concept plan includes a legible, permeable and connected street layout and open space network that will encourage walking and cycling; and is consistent with the NSW Planning Guidelines for Walking and Cycling.

### 4.8.9 Crime Prevention through Environmental Design (CPTED) Principles

The Crime Prevention through Environmental Design (CPTED) Principles identify opportunities to minimise crime through appropriate environmental design. The revised concept plans for the site incorporates CPTED principles by encouraging passive surveillance of public spaces through appropriate sight lines and street layouts as well as encouraging community ownership of public spaces through the provision of attractive, well maintained and well used spaces.

### 4.8.10 Healthy Urban Development Checklist

The Healthy Urban Development Checklist provides advice on urban development policies, plans and proposals to encourage a built environment that contributes positively to the health of the community. The checklist identifies key characteristics and considerations for health focused design and these are discussed in **Table 4-3** below.

**Table 4-3 Health Urban Development Checklist**

| Quick Guide Checklist | Y/N | Comment |
|---|---|---|
| ***Are there likely to be significant issues related to:*** | | |
| *Access to fresh, nutritious and affordable food?* | *N* | Fresh and nutritious food is readily available in the local area. |
| *Preservation of agricultural lands?* | *N* | The proposal does not affect / remove any productive agricultural lands. |
| *Support for local food production?* | *N* | The proposal does not impact local food production. |
| ***Are there likely to be significant issues related to:*** | | |
| *Encouragement of incidental physical activity?* | *N* | The permeable and connected street and open space networks will encourage incidental physical activity. |
| *Opportunities for walking, cycling and other forms of active transport?* | *N* | The legible, permeable and connected street layout and open space network that will encourage walking and cycling |
| *Access to usable and quality outdoor spaces and recreational facilities?* | *N* | The proposal includes significant useable and quality open space that will be easily accessible to the community. |
| ***Are there likely to be significant issues related to:*** | | |
| *Provision of housing that supports human and environmental health?* | *N* | The proposal will increase the supply of housing to support human and environmental health. |

| Quick Guide Checklist | Y/N | Comment |
|---|---|---|
| *Dwelling diversity?* | *N* | The proposal specifically seeks to increase housing diversity to meet the changing housing needs of the community. |
| *Affordable housing?* | *N* | The proposal seeks provide for a mix of densities, lot sizes and housing types to increase the supply of more affordable housing. |
| *Adaptability and accessibility of housing?* | *N* | The proposal seeks to provide a mix of housing types including adaptable and accessible housing to meet the needs of the community. |
| ***Are there likely to be significant issues related to:*** | | |
| *Availability of public transport services?* | *N* | The proposal includes bus routes to ensure that all future residents have access to public transport. |
| *Reduction of car dependency and encouragement of active transport?* | *N* | The proposal includes a future neighbourhood centre to service the local community and reduce car dependency. |
| *Encouragement of infill development and/or integration of new development with existing development?* | *N* | The proposal seeks to increase the residential densities of the existing Concept Approval. |
| *Telephone and internet connectivity?* | *N* | Utilities and services will be made available at the site. |
| ***Are there likely to be significant issues related to:*** | | |
| *Location of jobs to housing and commuting options?* | *N* | The site is within close proximity to the existing employment centres of Wollongong and Shellharbour and the proposal incorporates a substantial amount of future employment lands. |
| *Access to a range of quality employment opportunities?* | *N* | The site is within close proximity to the existing employment centres of Wollongong and Shellharbour and the proposal incorporates a substantial amount of future employment lands. |
| *Access to appropriate job training?* | *N* | The site is within close proximity of a number of higher education and training institutions. |
| ***Are there likely to be significant issues related to:*** | | |
| *Crime prevention and sense of security?* | *N* | The revised concept plans for the site incorporates CPTED principles. |
| ***Are there likely to be significant issues related to:*** | | |
| *Access to green space and natural areas?* | *N* | The proposal includes substantial open space and natural areas. |
| *Public spaces that are safe, healthy, accessible, attractive and easy to maintain?* | *N* | The proposal identifies areas for safe, attractive and accessible public spaces. |
| *Quality streetscapes that encourage activity?* | *N* | Streetscape design will be subject to future applications over the site. |
| *Sense of cultural identity, sense of place and public art?* | *N* | The proposal promotes a strong sense of place through physical and visual connections to the water and mountains. |
| *Preservation and enhancement of places of natural, historic and cultural significance?* | *N* | The proposed modification does not include any physical works on site. However, the preservation and enhancement of places of historic, natural and cultural significance will be a consideration of future development applications over the site. |
| ***Are there likely to be significant issues related to:*** | | |
| *Access to a range of facilities to attract and support a diverse population?* | *N* | The site is within close proximity to existing services and facilities, and a range of facilities are proposed under the existing Concept Approval. |

| Quick Guide Checklist | Y/N | Comment |
|---|---|---|
| *Responding to existing (as well as projected) community needs and current gaps in facilities and/or services?* | *N* | The site is within close proximity to existing services and facilities, and a range of facilities are proposed under the existing Concept Approval. |
| *Early delivery of social infrastructure?* | *N* | The site is subject to Part 6 of WLEP 2009 which requires satisfactory arrangements to be made for state and local infrastructure (including social infrastructure) prior to the site being developed). |
| *An integrated approach to social infrastructure planning?* | *N* | The site is subject to Part 6 of WLEP 2009 which requires satisfactory arrangements to be made for state and local infrastructure (including social infrastructure) prior to the site being developed). |
| *Efficiencies in social infrastructure planning and provision?* | *N* | N/A |
| ***Are there likely to be significant issues related to:*** | | |
| *Environments that will encourage social interaction and connection among people?* | *N* | The proposal includes an accessible and connected oped space network to encourage social interaction. |
| *Promotion of a sense of community and attachment to place?* | *N* | The proposal promotes a strong sense of place through physical and visual connections to the water and mountains. |
| *Local involvement in planning and community life?* | *N* | N/A |
| *Social disadvantage and equitable access to resources?* | *N* | The proposal promotes equitable access to resources. |
| *Community severance, division or dislocation?* | *N* | The proposal promotes a connected community through the provision of a walkable centre and open space network. |
| ***Are there likely to be significant issues related to:*** | | |
| *Air quality?* | *N* | The proposal maintains appropriate buffers to the Tallawarra Power Station. |
| *Water quality and safety?* | *N* | The proposal includes water quality measures. |
| *Disturbance and health effects associated with noise, odour and light pollution?* | *N* | The proposal maintains appropriate buffers to the Tallawarra Power Station. |
| *Potential for hazards (both natural and man made)?* | *N* | A detailed land capability assessment has been undertaken, and where required, mitigation measures will minimise any potential for hazards. |
| *Vector catchments and the potential for pest borne disease?* | *N* | N/A |

# 5 Environmental Assessment

This section assesses environmental impacts

## 5.1 Key Environmental Aspects

Provide table that summarises the various Environmental aspects, assessed importance and issues, a priority ranking of assessment, what studies have been conducted and how these issues have been addressed

## 5.2 Traffic & Transport

A Traffic Impact Assessment has been prepared by Cardno (2017e) to address the SEARs, with the full assessment contained at **Appendix D**. The SEARs addressed in this section are identified in **Table 5-1**.

**Table 5-1 Secretary's Environmental Assessment Requirements (Flooding)**

| Secretary's Environmental Assessment Requirements | Where Addressed |
|---|---|
| ***6. Transport and Accessibility*** | |
| The modification request shall include a Traffic Impact Study prepared in accordance with the RTA's Guide to Traffic Generating Developments which also addresses:<br>▪ The impact of the additional lots on the road network, including connections to the Princes Highway and the Princes Motorway;<br>▪ Staging and funding of infrastructure, including the provision of connections to Cormack Avenue and Haywards Bay;<br>▪ Mitigation of road traffic noise;<br>▪ Traffic and road safety impacts;<br>▪ Any impacts of the proposed bypass of Albion Park Rail; and<br>▪ The retention of foreshore access links. | **Section 5.2.2 and Appendix E** |

### 5.2.1 Tallawarra Lands Concept Approval

Gabites Porter completed a Traffic Impact Assessment (2011) (TIA) to inform the Tallawarra Lands Concept Plan Approval, with an addendum to the initial TIA provided following comments from Roads and Maritime Services (RMS and Council) (Gabites Porter, 2012). These reports were summarised within the Environmental Assessment completed by DFP (2011) to inform the Concept Approval. The Gabities Porter Assessment investigated the traffic generation rates that would result as part of the development of the Tallawarra Lands, investigating the associated impacts of the surrounding road network. This process identified the road /intersection upgrades that would be required as well as the impacts associated with car parking and public transport provision throughout the site.

The TIA found that 2200 (vehicles per hour) vph would be generated by the development in the morning peak, with 1850 vph generated in the evening. The increase in traffic would not result in any requirements for network upgrades outside of those already identified to respond to natural growth in demand. Four access points will be provided for the site, two from the Princes Highway and one from Cormack Avenue on the western side of the development and the last from Gilba Road to the north. Public Transport would be required, especially connections through to Albion Park Rail and Dapto Train stations and through to the commercial precincts within the site. Walk and cycle paths would need to be provided throughout the site, with connections provided to the Princes Motorway over pass to the north of the site and connections through to Haywards Bay in the south.

### 5.2.2 Concept Plan Modification Impact Assessment

The modification to the precinct boundaries included within this Concept Plan Modification has the potential to alter the TIA undertaken for the Tallawarra Lands. To assess the impact a TIA was conducted by Cardno (2017e), with the full report contained at **Appendix D**. This TIA is supplementary to the initial Tallawarra Lands Concept Plan study completed by Gabities Porter (2011), which remains the primary technical assessment for the overall development.

Cardno (2017e) re-evaluated the items addressed in the approved TIA against the proposed modifications to the Tallawarra Lands. The following summarises the findings of this assessment;

> The proposed increase in development yield does not result in any critical network operational concerns or significant differences when compared with the approved yield (as tested by RMS as part of the APRB design development);

> The intersection performance at Dapto off-ramp/Princes Hwy in the PM peak shows potential capacity issues by 2041, which can be addressed by converting it to traffic signal or roundabout control;

> The development of the Lakeside Precinct and consequential delivery of the Haywards Bay Link are dependent on Energy Australia plans for the site. It is understood that the development of this precinct is not likely to take place in the near future but should this go ahead, the network operation would be identical to that without this development (and it does not require any upgrades to the external road network);

> No substantial issues at the operation/performance of the remaining intersections along all scenarios compared to the original Albion Park Rail Bypass models. LoS was calculated at D or better, which is deemed satisfactory.

### 5.2.3 Mitigation Measures

#### *5.2.3.1 Conditions of Approval*

The Concept Plan Approval included a number of additional requirements for all future approvals with regards to Traffic and Transport as detailed in **Table 5-2**. These requirements are considered sufficient for assessment of the Proposed Modification.

**Table 5-2 Tallawarra Lands Concept Plan Conditions of Approval – Stormwater and Flooding**

| Tallawarra Lands Concept Plan Conditions of Approval | | |
|---|---|---|
| ***Schedule 3 – Future Environmental Assessment Requirements*** | | ***Response*** |
| Roads and Maritime Services Requirements | **14 Only one direct access from the development to the Princes Highway is permitted**<br>Future applications for road works must demonstrate that only one direct access from the development to the Princes Highway is proposed. The access shall be at the existing junction of the Princes Highway and Yallah Bay Road. | |
| | **15 Upgrade of the junction of the Princes Highway and Yallah Bay Road to a roundabout**<br>The first future application to Council which includes works must be accompanied by an approved design for the upgrade of the junction of the Princes Highway and Yallah Bay Road.<br>The intersection must be upgraded to a roundabout. The submitted design must be to the satisfaction of and have been approved by Roads and Maritime Services and Wollongong City Council. | |
| | **16 Requirement for a Concept Design for the Closure of Cormack Avenue**<br>The first future application to Council for superlot subdivision must include a concept design for the physical closure of the existing junction of Cormack Avenue with the Princes Highway.<br>The submitted design must be to the satisfaction of and have been approved by Roads and Maritime Services and Wollongong City Council.<br>The road closure is to be implemented in conjunction with the development of the Central Precinct. | |
| | **17 Requirement for a Concept Design for Traffic Calming of Gilba Road** | |

| | |
|---|---|
| | The first future application for subdivision of the northern residential precinct must include a concept design for the traffic calming of Gilba Road, where is provides access to the northern residential precinct. The proponent shall obtain design criteria from Wollongong City Council |
| | **18 Requirement for a Concept Design for Road works and lighting on the Princes Highway**<br>The first future application which involves works on the Princes Highway must be accompanied by a concept design for all required road works on the Princes Highway. The concept design shall comply with Austroads Guide to Road Design. Any required lighting on the Princes Highway shall be upgraded/provided in accordance with AS/NZS1158. The plan must be to the satisfaction of and approved by Roads and Maritime Services. |
| | **19 Road Network – Design of roads, footpath crossings, footpaths and cycleways**<br>All future application that include roads, footpath crossings, footpaths and cycleways, must demonstrate that these elements have been designed to satisfy or exceed the requirements of Wollongong City Council. |
| | **20 Road link with Haywards Bay required to be traffic calmed and to accommodate two-way movement of buses**<br>The future application which includes the Haywards Bay road link, shall demonstrate that the link can accommodate the two-way movements of buses and that it is traffic calmed to the satisfaction of Wollongong City Council. |

#### *5.2.3.2 Statement of Commitments*

Mitigation measures identified by the SoCs that are applicable to Traffic and Transport, and which would apply to the Modification Proposal, are listed in **Table 5-3** below.

**Table 5-3 Tallawarra Lands Concept Plan Statement of Commitments – Traffic and Transport**

| Tallawarra Lands Concept Plan Statement of Commitments | | *Response* |
|---|---|---|
| Roads / Bridge in E2 Zone | 1. TRUenergy commits to offering to enter into an agreement with Wollongong City Council whereby approval under Part 5 of the EP&A Act would be sought for the proposed roads and bridge in the E2 zone in accordance with Clause 94(1) of SEPP Infrastructure 2007. This process would put in place arrangements for the provision of the proposed roads and bridge in the E2 zone by or on behalf of Council. This includes the bridge across duck creek and the length of road either side of the bridge as well as the road that leads into the B6 enterprise Corridor zoned land from the Princes Highway. | |
| Traffic Management | TRUenergy commits to consulting with Wollongong City Council in place satisfactory arrangements to deliver the following road improvements:<br>▪ The conversion of the intersection of Cormack Avenue and the Princes Highway into a two lane circulating roundabout;<br>▪ Two lane circulating roundabouts at each of the two access points to the site from the Princes Highway;<br>▪ The provision of a roundabout at the site access point off Cormack Avenue;<br>▪ Upgrade Yallah Bay Road to a collector road;<br>▪ Construction of the north-south connector road; and<br>▪ Consequential works to facilitate the site access points. | |

Traffic and Transport issues associated with the development of the Tallawarra Lands would be managed in accordance with the Concept Plan Approval and associated SoCs referred to above. These are considered adequate to address the potential impacts of the Modification Proposal, with no additional significant impact on traffic and transport as a result of the modification.

## 5.3 Stormwater and flooding

A Flood Risk Assessment has been prepared by Cardno (2017a) to address the SEARs, with the full assessment contained at **Appendix E**. The SEARs addressed in this section are identified in **Table 5-4**.

**Table 5-4 Secretary's Environmental Assessment Requirements (Flooding)**

| Secretary's Environmental Assessment Requirements | Where Addressed |
|---|---|
| ***11. Flooding*** | |
| The modification request shall:<br>• Provide an assessment of any additional flood risks associated with the proposal in accordance with the NSW floodplain Development Manual (2005), including the impact of flooding on the development, the impact of the development on flood behaviour and the potential impacts of climate change, coastal processes, sea level rise and an increase in rainfall intensity; and<br>• Address changes in hydrology from the proposed modification (runoff, tidal movement. Flood flows and groundwater regime) and impacts on environmental lands within and surrounding the site. | **Section 5.3.2 and Appendix E** |

### 5.3.1 Tallawarra Lands Concept Approval

Bewsher Consulting completed a Flood Risk Assessment (2010) to inform the Tallawarra Lands Concept Plan Approval. This report was summarised within the Environmental Assessment completed by DFP (2011) to inform the Concept Approval. The Bewsher Assessment investigated the existing flooding characteristics of the site and then determined how this would be altered by the Concept Plan.

The flooding on site principally relates to Duck Creek which runs through the Tallawarra Lands between the Central and Lakeside Precincts. The flooding within the site is generally caused due to the extensive size of the Duck Creek catchment upstream of the site, with some minor flooding experienced within the gullies that drain into Duck Creek from the north.

The assessment undertaken identified that there is a small area that is affected by flooding within the North Shore Precinct that is attributed to drainage gullies that flow directly into Lake Illawarra. The Central Precinct was modelled to have flood affectation through the gully that runs through the middle of the precinct and with minor impacts within the Employment Area fronting Yallah Road. The Southern Precinct will also see some minor flooding impacts. The majority of flooding impacts will be contained within the Duck Creek riparian corridor and the associated wetlands to the south of Yallah Bay Road.

### 5.3.2 Concept Plan Modification Impact Assessment

The modification to the precinct boundaries included within this Concept Plan Modification have the potential to alter the flooding characteristics of the Tallawarra Lands. To assess the impact a Flood Risk Assessment was conducted by Cardno (2017a), with the full report contained at **Appendix E**. This Flood Risk Assessment is supplementary to the initial Tallawarra Lands Concept Plan study completed by Bewsher (2010), which remains the primary technical assessment for the overall development.

Cardno (2017a) re-evaluated the items addressed in the approved flood study against the proposed modifications to the Tallawarra Lands. The following summarises the findings of this assessment;

> Potential Encroachment into Flood Prone Areas – The proposed boundary extensions in both the North Shore and Central Precincts are not within the flood extent. The proposed modification will therefore not cause the project to be subject to any additional flood risk. The modifications will not have any additional impacts on the flooding extent, behaviour or storage within the floodplain.

> Flood-Time Access – The proposed modifications to the North Shore and Central Precincts do not propose any change to the access arrangements to either precinct. As such, there are no changes to the Flood-Time Access assessments undertaken in the Bewsher (2010) study.

> Implications of Potential Climate Change – The areas proposed for development as part of this modification will occur at the same levels or higher than the areas of approved development and, therefore, are not expected to be impacted by the increased lake flood levels as a result of sea level rise or the increase in Rainfall intensity.

Additionally, the Cardno (2017a) assessment reviewed the impact of Hydrologic changes on the Tallawarra Lands site. This assessment encompassed a review of the following assessment covered in the Bewsher (2010) study;

> Changes in Runoff and Associated Impacts – Bewsher (2010) referred to a Drainage Assessment report completed by BMT WBM (2010) to detail the issues associated with site development runoff quality and quantities. These issues were identified as being able to be addressed by adopting a series of mitigation measures in the design phase. The modification does not cover a substantial increase in size compared to the approved development land, meaning that any increase of runoff can be accommodated by the proposed measures for achieving the stormwater quality and quantity objectives for the remainder of the development.

> Changes to Tidal Movements and Associated Impacts – The approved flood study indicates that the proposed development will have no impact on the local tidal regime. The proposed modifications are located in elevations higher than the lowest level within the approved plans, ensuring no impacts to the existing tidal regime.

> Changes to Flood Flows and Associated Impacts – Both the increase in development footprints associated with the North Shore and Central Precincts are assessed as being insignificant when compared against the peak discharges generated from the greater Duck Creek and Lake Illawarra catchments. As such, these increases in developed area are not expected to result in changes in the flood behaviour within Duck Creek or Lake Illawarra.

> Changes to Groundwater Regime and Associated Impacts – The Bewsher (2010) study indicated that proposed work in the North Shore and Central Precinct is not proposed in the low-lying areas where groundwater and saltwater interface occurs. Further to this, development of some of the hilly portions of the site will not change the slow vertical seepage regimes associates with substantially impervious clay-bedrock conditions. Based on these factors, the proposed modifications are not expected to result in any changes to the groundwater regime.

### 5.3.3 Mitigation Measures

#### *5.3.3.1 Conditions of Approval*

The Concept Plan Approval included a number of additional requirements for all future approvals under the Concept Plan Approval with regards to Flooding and Stormwater management as detailed in **Table 5-5**. These requirements are considered sufficient for assessment of the Proposed Modification.

**Table 5-5 Tallawarra Lands Concept Plan Conditions of Approval – Stormwater and Flooding**

| Tallawarra Lands Concept Plan Conditions of Approval | | |
|---|---|---|
| ***Schedule 3 – Future Environmental Assessment Requirements*** | | ***Response*** |
| Future Environmental Assessment Requirements | **2 Stormwater management**<br>Future applications shall be accompanied by a detailed stormwater management plan prepared by a qualified practicing Civil Engineer and in accordance with the requirements of Council which addresses the following:<br>a) Details on how a reduction of rubbish or hydrocarbon pollutants will be achieved prior to discharge to Lake Illawarra; and<br>b) Any structural works, including works for stormwater capture and treatment are required to be located outside riparian areas. | |
| | **3 Stormwater Management Masterplan**<br>The first future application to Council for superlot subdivision must include a stormwater management | |

| | | |
|---|---|---|
| | masterplan consistent with the requirements of Wollongong City Council's LEP, DCP and relevant Australian standards for stormwater management. | |
| | **4 Floodplain Risk Assessment and Management**<br>The first future application to Council for superlot subdivision must include a floodplain risk assessment and management plan consistent with the requirements of Wollongong City Council's LEP, DCP, Duck Creek Flood Study (2012) and the NSW Floodplain Development Manual (2005). | |

### *5.3.3.2 Statement of Commitments*

Mitigation measures identified by the SoCs that are applicable to Stormwater and Flooding, and which would apply to the Modification Proposal, are listed in **Table 5-6** below.

**Table 5-6 Tallawarra Lands Concept Plan Statement of Commitments – Stormwater and Flooding**

| Tallawarra Lands Concept Plan Statement of Commitments | | *Response* |
|---|---|---|
| | 28. Future DAs will adopt the following flood risk management principles. It is noted that these principles exceed, or are equal to, those currently applied by Wollongong City Council in respect of the West Dapto Release Area:<br>• All access roads to development precincts to be at or above 100 year flood level after allowing for year 2100 climate change impacts.<br>• Filling for development areas to be at a minimum level of the 100 year flood level allowing for year 2100 climate change impacts.<br>• Development floors levels for each land use to be at the flood planning levels set by Wollongong City Council's DCP (Chapter E13) | |
| Flood Risk Management | 29. Future DAs will adopt the following flood risk management principles:<br>a) All future development decisions will be based on the most up-to-date flood model available at the time of the future DA and include all components of the project which may influence flood behaviour (e.g. changes to riparian vegetation, filling adjacent to the floodplain, new bridges, etc.). It is recognised that flood models need revision over time as new data becomes available or Government polices alter. This includes the imminent revisions to the rainfall intensity-frequency-duration data published by the Bureau of Meteorology, and changes in Government policy and/or accepted practice concerning the impacts of climate change on sea levels and rainfall intensities. Further, flood levels within development areas remote from the main waterways will be modelled having regard to the capacity of the drainage system of the development area and its overland flow routes.<br>b) Land to be filled will be at sufficient height and grade to allow free-drainage of the filled area into the surrounding waterway.<br>c) When stormwater concept designs are developed for proposed fill areas, potential flood hazard areas will be analysed and managed in accordance with best practice and the requirements of the Floodplain Development Manual and Council's DCP (Chapters E13 and E14). | |

d) No filling of floodplain land will occur which produces off-site impacts in accordance with the "flood affectation" requirements of Chapter E13 of Council's DCP.

e) All future housing will be serviced by at least one road route providing egress off-site and at a height for the entire route which is no lower than the 100 year ARI flood level allowing for year 2100 climate change impacts. Where future housing areas are isolated in a PMF, facilities (e.g. high ground or elevated building floors) will be provided for safe refuge above the PMF level, within the isolated area.

f) The existing old railway bridge across Duck Creek provides significant constriction to flood flows, raising flood levels upstream in major flood events. The proponent commits to the following measures to mitigate flooding impacts:

- Designing the new bridge to provide less constriction to achieve lower upstream flood levels for the 100 year ARI and larger events; and
- Setting the levels of new roads, landfill and habitable floor levels of proposed buildings based on flood modelling consistent with Council's Blockage Policy.

Stormwater and Flooding issues associated with the development of the Tallawarra Lands would be managed in accordance with the Concept Plan Approval and associated SoCs referred to above. These are considered adequate to address the potential impacts of the Modification Proposal, with no additional significant impact on flooding and stormwater as a result of the modification.

## 5.4 Noise

A Noise Assessment has been prepared by Pacific Environment (2017) to address the SEARs, with the full assessment contained at **Appendix F**. The SEARs addressed in this section are identified in **Table 5-7**.

**Table 5-7 Secretary's Environmental Assessment Requirements (Noise)**

| Secretary's Environmental Assessment Requirements | Where Addressed |
|---|---|
| ***5. Noise Assessment*** | |
| The modification request shall include an acoustic assessment prepared by an appropriately qualified acoustic expert, which:<br>• Includes an assessment of acoustic impacts from all surrounding noise sources, including the Tallawarra Power Station and any required buffer zones; | **Section 4 of Appendix F** |
| • Includes an assessment of the cumulative impacts of noise sources (road, rail, aviation, power station, industrial and commercial areas) on the proposed modification; | **Section 4 Appendix F** |
| • Demonstrates that future dwellings on the proposed lots would comply with the noise levels standards specified in the *State Environmental Planning Policy (Infrastructure) 2007*, and the requirements of the *Development of New Rail Corridors and Busy Roads – Interim Guideline, 2008*; | **Section 3.3.3 and Section 3.3.4 of Appendix F** |
| • Demonstrates compliance with the NSW Industrial Noise Policy at the boundary of nearby residential lots; | **Section 3.2 of Appendix F** |
| • Includes a plan clearly illustrating noise contour lines in relation to the proposed expansion of residential uses on the site; | **Figure 7-1 of Appendix F** |
| • Includes an assessment of, and advice on the status of, the matters specified in Schedule 3 Future Environmental Assessment Requirements 5, 6 and 7 of the Concept Approval, and if any of those requirements have been triggered, information on their progression, and | **Section 6 of Appendix F** |

| | |
|---|---|
| • Includes details of ongoing noise management and mitigation measures, including design responses to minimise noise impacts | **Section 8 of Appendix F** |

### 5.4.1 Tallawarra Lands Concept Plan

To inform the Concept Plan, Sinclair Knight Merz (SKM 2011) prepared a Noise Assessment for the Tallawarra Lands. The assessment was reviewed as part of the investigations undertaken and remains the technical noise assessment for the overall approved Concept Plan, with the Pacific Environment (2017) assessment providing the additional technical assessment for the areas of proposed modification consistent with the SKM (2011) assessment.

The assessment comprised:

- An overview of noise issues to identify potential land use conflicts that may arise within the development;
- Development of noise criteria that considers existing and future land uses; and
- A Compatibility Analysis to identify noise control measures that may need to be incorporated into the development to minimise noise conflict in the future.

#### *5.4.1.1 Tallawarra Power Station Noise Impacts*

Noise impacts from the Tallawarra Power Station were assessed to inform the study. Key results show that the power station $L_{Aeq}$ noise impacts within the Central and Southern residential precincts are less than 40 dB(A), and therefore comply with the criteria set out in the *Industrial Noise Policy* (INP) (EPA 2000). Within the North Shore Precinct, $L_{Aeq}$ noise impacts along the southern ridge varied between 35 and 45 dB(A), and it was noted that '*noise attenuation in this area is very steep as a consequence of the screening effect of the ridge*' (SKM 2011).

#### *5.4.1.2 Potential Noise Impacts to Residential Precincts*

Potential noise impacts at the proposed residential precincts in the Tallawarra Lands were assessed and the following conclusions were made in the assessment:

- **North Shore Precinct**: Potential $L_{Aeq}$ and $L_{Amax}$ noise impacts have been predicted for the southern most parts of the precinct as a result of power station noise, however, predicted noise levels rapidly decrease further north due to screening from the ridge. Maximum exceedances of $L_{Aeq}$ noise criteria are expected to occur at properties adjacent to the southern boundary, and to be in the order of 5 dB(A).
- **Central Precinct**: Road noise impacts from the M1 Princes Motorway (formally Southern Freeway) are predicted to exceed night time noise guidelines by approximately 5 dB(A) at properties along the western boundary, whilst minor impacts may occur for properties in the central north area. In addition, rail noise was predicted to potentially exceed noise guidelines by approximately 5 dB(A) across the area, with the exception of the south western corner where exceedances of up to 9 dB(A) have been predicted.

#### *5.4.1.3 Tallawarra Lands Noise Management*

The assessment determined that noise generated by road traffic on the Princes Motorway and rail traffic on the Illawarra Rail Line is expected to result in exceedances of noise guidelines of up to 5 dB(A) in the North Shore and Central Precincts.

As a result, the assessment recommended both passive and active mitigation measures as part of the site development. Passive mitigation refers to noise reductions obtained through the consideration of noise in site planning and building design, while active mitigation sets out methods to reduce noise through the inclusion of noise reducing materials or specific construction techniques.

##### 5.4.1.3.1 Passive Noise Mitigation

The following passive noise mitigation measures were recommended:

- **Building Row Screening**: Where residential properties are constructed, successive rows of buildings will create a substantial shield for subsequent properties.
- **Internal Building Layout**: Where sleeping areas in residential buildings can be positioned at the furthest point from the noise source, substantial screening and distance attenuation benefits can be obtained and as such reduce the impacts of noise for these sensitive building uses.

#### 5.4.1.3.2 Active Noise Mitigation

The following active noise mitigation measures were recommended:

- **Noise Barriers**: A wall or mound constructed along the top of the ridge within the Central Precinct may provide an effective option for mitigating noise from the power station for North Shore Precinct receivers.
- **Building Design**: Where considered necessary, building facades facing the dominant noise source should be constructed of substantial materials such as brick or masonry, or include sound insulation materials in their design.

### 5.4.2 Concept Plan Modification Impact Assessment

A Noise Assessment was prepared by Pacific Environment (2017) to assess the potential noise related issues associated with the proposed modifications to the Tallawarra Lands development. The objective of the assessment was to identify noise issues to allow for the effective management of existing infrastructure combined with maintaining acceptable socio-acoustic standards for proposed land redevelopment.

#### *5.4.2.1 Noise Setting*

The assessment determined that industrial noise emissions from the operations of the Tallawarra Power Station have the greatest potential to influence surrounding ambient noise environs. Secondary noise issues are associated with noise from existing transportation, including road traffic (Princes Motorway), rail (Illawarra Rail Line), and aircraft (Illawarra Regional Airport). Potentially affected receivers located adjacent to or within line of sight of these sources may be subject to potential impacts.

General noise issues are influenced by local industry and the M1 Princes Motorway. Tertiary noise levels include ingress and egress of local traffic flows and general urban noise sources consistent with the proposed land use for the area.

#### *5.4.2.2 Existing Noise Environment*

Unattended noise monitoring was undertaken using Ngara noise loggers and a RION-31. All noise loggers were set to record A-Weighted noise levels every 15 minutes and set to ‘fast’ response time. Short term (attended) noise measurements were also carried out.

Two locations were selected for the North Shore Precinct (E1 and E2) and two for the Central Precinct (W1 and W2). The locations were established to obtain current ambient profiles in the areas representative of the proposed Tallawarra Lands development (refer to Figure 5-1 of the Noise Assessment at **Appendix F**).

Within the North Shore Precinct, noise monitoring results indicate that Location E1 is generally consistent with a low noise environmental, typical of a rural setting. Noise monitoring at E2 was similar, with some influence from the operations of the Tallawarra Power Station.

Noise monitoring within the Central Precinct (Location W1 and Location W2) was consistent with a typical ‘suburban’ noise environment. Night time noise levels were low. Road traffic noise was recorded as being a key contributor (particularly during daytime periods).

#### *5.4.2.3 Noise Design Goals*

Measurements of current conditions from 2017 noise profiles have been referenced in the assessment, with reasonable and feasible noise design goals recommended. Table 5-8**Table 5-8** outlines the recommended noise design goals for the proposed development. The recommended goals maintain consistency with historical data, and reflect current noise environs. Compliance with the night time noise goals will drive the land use compatibility.

**Table 5-8 Recommended Noise Design Goals (Pacific Environment 2017)**

| Location | Measured Level (night) | | | | Amenity Goal (ANL with NSW INP modification) | Intrusive Goal ($L_{A90}$ + 5) |
|---|---|---|---|---|---|---|
| | $L_{Aeq}$ | $L_{A90}$ | Ind Infl | ANL | | |
| **North Shore Precinct** | | | | | | |
| E1 | 37 | 27 | Nil | 40 | 40 | 35 |
| E2 | 39 | 31 | 37 | 40 | 37 | 36 |
| **Central Precinct** | | | | | | |
| W1 | 47 | 30 | Nil | 45 | 45 | 35 |
| W2 | 44 | 34 | 37 | 45 | 45 | 39 |

#### *5.4.2.4 Industrial Noise Impacts*

Modelled noise levels for the Tallawarra Lands indicate that received noise levels within the North Shore Precinct would be expected between 35 – 45 dB(A). Within the Central Precinct modelled noise levels were predicted below 40 dB(A).

Predictions were made using noise enhancing meteorological conditions with both temperature inversion (3ºC/100 metre) and source to receiver wind speeds (2 metres per second) adopted. This provides a worst-case scenario and it is not known if these conditions are a feature for the area.

#### *5.4.2.5 Transportation Noise Impacts*

- **Road -** Noise modelling was undertaken for the Albion Park Rail Bypass by Renzo Tonnin and Associates (2015). Day time $L_{Aeq\ 15\ hr}$ and night time $L_{Aeq.\ 9\ hr}$ predictions have been referenced for 2030 design year (build scenario). Noise levels that have the potential to be at or above the adopted traffic noise goals extend into the western boundary of the Central Precinct.
- **Rail -** Modelled train pass-by events for the Illawarra Rail Line were recorded in the range 45 – 54 dB(A). Maximum noise levels were predicted between 69 – 79 dB(A). Compliance with current rail goals was predicted and no land use planning issues from existing rail noise are anticipated for the North Shore or Central precincts.
- **Aircraft -** The Tallawarra Lands is located outside the Illawarra Regional Airport indicated 20 ANEC contour. The site is considered acceptable for residential purposes in accordance with AS2021-2000 *Acoustics – Aircraft Noise Intrusion – Building Siting and Construction*. No land use planning issues from existing aircraft noise are anticipated for the North Shore or Central Precincts.

#### *5.4.2.6 Urban Noise Impacts*

The dwellings within the Central Precinct are the closest potentially affected receivers, located approximately 400 metres from an area that has been flagged for future industrial and commercial development. At 400 metres, industrial noise (assuming an industrial boundary level of 70 dB(A) to meet compliance with NSW INP requirements), would be expected to result in incremental received noise levels of less than 15 dB(A) and would not contribute to existing industrial noise levels.

It is not anticipated that noise impacts resulting from the development will be any greater than noise impacts on the previously approved lots. Therefore, no land use planning issues from cumulative industrial operations are expected for the North Shore or Central precincts.

#### *5.4.2.7 Recommendations*

The assessment identified several planning measures to mitigate or reduce potential land use conflicts including:

> Noise levels and associated attenuation should be re-evaluated as the development progresses southwards towards the Power Station(s), with the development that has occurred potentially helping to attenuate noise impacts and therefore minimising the need for noise mitigation.

> Include a covenant on the title for properties with potential external noise levels above 40 dB(A) – this will make it clear to prospective purchasers that the land may be subject to noise impacts from the existing Tallawarra Power Station.

> Include provisions on the 88B Instrument for the design and construction of properties where internal noise levels have the potential to be above the recommendations of Australian Standard (2000), *AS2107 Acoustics – Recommended Design Sound Levels and Reverberation Times for Building Interiors.*

At property mitigation can include measures to increase the acoustic performance of residences, with the focus to protect the internal amenity of the property. Upgrades to facades should be implemented on a case by case basis and would depend on proposed building layout and proposed design.

### 5.4.3 Mitigation Measures

#### *5.4.3.1 Conditions of Approval*

The Concept Plan Approval included a number of additional requirements for all future approvals under the Concept Plan Approval with regards to noise as detailed in **Table 5-9**.

**Table 5-9 Tallawarra Lands Concept Plan Conditions of Approval – Noise**

| Tallawarra Lands Concept Plan Conditions of Approval | | |
|---|---|---|
| ***Schedule 3 – Future Environmental Assessment Requirements*** | | |
| Future Environmental Assessment Requirements | **5 Acoustic Impacts - Residential**<br>Future applications that propose to create residential allotments must be accompanied by an acoustic assessment which demonstrates that it will be possible for future dwellings on the proposed allotments to comply with the noise level standards specified in *State Environmental Planning Policy (Infrastructure) 2007* and with the requirements of the *Development near Rail Corridors and Busy Roads – Interim Guideline, 2008*. | The Noise Assessment prepared by Pacific Environment demonstrates that it will be possible for future dwellings on the proposed allotments to comply with the relevant noise level standards. |
| | **6. Acoustic Impacts – Industrial uses**<br>Future application for industrial developments shall be accompanied by an acoustic assessment which provides:<br>a) Details on on-going noise management during operation of the site for the life of the development to ensure adequate amenity levels for all users of the site;<br>b) Mitigation measures to minimise noise disturbance to residential buildings on the site and to adjoining or adjacent properties; and<br>c) Compliance with the NSW Industrial Noise Policy is achieved at the boundary of nearby residential lots. | A Noise Assessment has been prepared that details on-going noise management, mitigation measures to minimise noise disturbance and compliance with the NSW Industrial Noise Policy, |
| | **7. Per lot industrial noise contribution calculations**<br>The future application for subdivision of the industrial zoned lands shall be accompanied by a noise management plan that includes industrial noise contribution calculations and allocates a sound power levels to each lot within the industrial zoned areas of the site, such that acceptable noise levels are not exceeded within residential areas, the Central Precinct Neighbourhood Centre, and other sensitive receptors. The industrial noise contribution calculations shall be prepared by an appropriately qualified acoustic expert. | A Noise Assessment has been prepared that includes an industrial noise calculation at Section 5 of **Appendix F.** |

## 5.5 Biodiversity

A Biodiversity Assessment Report (BAR) was prepared by Ecoplanning (2017) to address the SEARs, with the full assessment contained at **Appendix G**. The SEARs addressed in this section are identified in **Table 5-10**.

**Table 5-10 Secretary's Environmental Assessment Requirements (Flora and Fauna)**

| Secretary's Environmental Assessment Requirements | Where Addressed |
|---|---|
| ***7. Flora and Fauna*** | |
| The modification request shall: | |
| • Include an assessment of biodiversity impacts in accordance with the "avoid, minimise and offset hierarchy", the *NSW Biodiversity Offset Policy for Major Projects,* using an appropriate biodiversity assessment methodology such as the *Framework for Biodiversity Assessment* 2014, and the *Environment Protection and Biodiversity Conservation Act 1999* (Cth); | A Framework for Biodiversity Assessment (2014) has been completed for the proposed development. |
| • Provide a field survey of the site in accordance with the *Threatened Species Assessment Guideline,* including:<br>a) An assessment and evaluation of the likely impacts on threatened species and their habitat; and<br>b) A description of the proposed actions to avoid or mitigate impacts or compensate for unavoidable impacts on threatened species and their habitat; | A field survey has been conducted, and assessment made on the likely impacts on threatened species and their habitat in Section 5 and Section 6 of **Appendix G**. Where impacts were not avoidable, mitigation measures and offsets are provided **Appendix G**. |
| • Outline the measures for conservation/management of high environmental value and biodiversity corridor lands identified in the *Illawarra Shoalhaven Regional Plan 2015*, any vegetation with connective importance, and to protect and manage the riparian corridor and adjacent aquatic habitat; | The study area is not identified as a biodiversity corridor under the Illawarra Shoalhaven Regional Plan 2015. The proposal will not result in the fragmentation or isolation of other remnants, as it does not act as an intermediary patch between two (or more) areas of habitat. The vegetation in the subject site mostly consists of fragmented patches of disturbed vegetation and edges of larger patches of bushland. Therefore, the vegetation in the subject site is not of connective importance. No riparian corridors are located within the subject site. |
| • Provide an updated Environmental Management Strategy (EMS) which addresses potential impacts (during all phases of development) on aquatic and terrestrial flora and fauna and their habitats (within the meaning of the *Threatened Species Conservation Act 1995* and the *Fisheries Management Act 1994*), in accordance with the OEH *Threatened Species Survey and Assessment Guidelines*, and DPI Fisheries' *Policy and Guidelines for Fish Habitat Conservation and Management 2013*. Provide details on monitoring programs designed to assess impacts on water quality, water flow and aquatic and riparian environments downstream of the proposal area; | Consideration of potential indirect impacts that may be incurred during all phases of development will be managed through the CEMP (see **Section 5.2.2 of Appendix G**). An EMS may form a component of the CEMP and will be more appropriately prepared at DA or detailed design stage when potential indirect impacts are more readily defined. It is noted that survey for terrestrial flora and fauna and their habitats has been completed in accordance with the TSSA Guidelines. No fisheries considerations have been identified. |
| • Address the potential impacts of the proposed modification on wetlands, including hydrologic regime/groundwater recharge, water quality and loss/degradation of habitat, and measures to minimise impacts; | Field assessment determined there to be no wetlands within the subject site. Several constructed farm dams were identified within the subject site, however have been mapped by NPWS (2002), as artificial wetlands, and have since been field validated as constructed waterbodies. |

| | |
|---|---|
| • Provide an updated survey of wetlands, including an inventory of wetland vegetation and mapped boundaries of wetland by vegetation type, using GIS; | Field assessment determined there to be no wetlands within the subject site |
| • Provide updated details of the presence and distribution of Groundwater Dependent Ecosystems (GDEs) and identify any potential impacts of GDEs; and | The Groundwater Dependent Ecosystems (GDE) Atlas identifies Terrestrial GDEs within the study area (see Appendix E of **Appendix G**). These areas are specific to vegetated areas of the site, including areas consisting predominantly of woody weed species. High and moderate potential GDEs have been identified in the study area based on regional studies. A small amount of impacts will be incurred to terrestrial GDEs within the study area, with all unavoidable impacts offset in accordance with the Framework for Biodiversity Assessment (2014). |
| • Provide updated investigations and mapping of Endangered Ecological Communities and justify/detail any impacts on the approved widths of riparian buffers, including to Lake Illawarra in the North Shore Precinct, any other proposed conservation methods on the site, and mitigation measures. | Endangered Ecological Communities in the study area were mapped and all unavoidable impacts to these communities were calculated (see **Section 3**). The proposal is situated outside of the riparian buffers associated with Lake Illawarra (Section 2.2 of **Appendix G**). |

### 5.5.1 Tallawarra Lands Concept Plan

An Ecological Assessment (EA) prepared by Eco Logical Australia (ELA, 2011a) informed the Tallawarra Lands Concept Plan Approval. The EA report was reviewed as part of the investigations undertaken and remains the technical ecological assessment for the overall approved Concept Plan, with the Ecoplanning (2017) assessment providing the additional technical assessment for the areas of proposed modification consistent with the ELA (2011a) assessment.

The assessment involved a review of readily available literature and database records pertaining to the ecology of the site, and a review of aerial photography and contour information to broadly verify the previous vegetation mapping prior to the site inspection.

A general site inspection was conducted by two ecologists over a four-day period. The following tasks were undertaken throughout the surveys:

> Verify the vegetation mapping previously undertaken across the study area and in particular the presence of Endangered Ecological Communities (EECs) listed under the TSC Act and EPBC Act;

> Conduct targeted surveys for threatened flora species;

> Assess and map fauna habitat values across the study area;

> Assess and map the condition of the vegetation type present; and

> Assess the likelihood of the study area to provide potential habitat for threatened and migratory species listed under the TSC Act and EPBC Act.

A target survey was completed in addition to the general site inspection to cover the remaining threatened flora species.

#### *5.5.1.1 Site Analysis*

The study area has undergone extensive past disturbance, particularly in the south and east where a number of former ash ponds used by the original coal fired Tallawarra Power Station now remain. Extensive vegetation clearance has occurred across the remainder of the site, mostly for grazing purposes. This has resulted in large areas of exotic grassland.

Despite the history of disturbance, the site retains ecological values in the form of remnant native vegetation, habitat for threatened species, riparian wetland features and a regional corridor linkage.

#### *5.5.1.2 Vegetation Communities*

A number of vegetation types were identified throughout the study area including natural remnants, EECs and areas that have been planted as part of past revegetation works. The six EECs recorded within the study are included:

> Swamp Sclerophyll Forest on Coastal Floodplains on the NSW North Coast, Sydney Basin and South East Corner Bioregions (SSF)

> Illawarra Lowlands Grassy Woodland of the Sydney Basin Bioregion (ILGW)

> Swamp Oak Floodplain Forest on the NSW North Coast, Sydney Basin and South East Corner Bioregions (SOFF)

> Coastal Saltmarsh of the Sydney Basin Bioregion (CS)

> Freshwater Wetlands on Coastal Floodplains (FW)

> Illawarra Subtropical Rainforest in Sydney Basin Bioregion (ISR)

None of the communities listed within the study area are listed under the EPBC Act.

#### *5.5.1.3 Retention of EEC Vegetation*

The Concept Plan requires the clearance of 51.63 ha of vegetation, of which 4.37 ha are EECs. The remaining 117.23 ha of EEC vegetation is to be preserved. The EA identified the following measures to retain EEC vegetation (and threatened species habitat) in the Concept Plan:

> Dedication of a number of environmental reserves including:
  - Duck Creek corridor;
  - A large wetlands reserve in the south east;
  - A reserve on the western boundary of the site near Yallah Creek;
  - Foreshore reserve between the power station and Duck Creek;

> Retention of vegetation in other areas of the site including:
  - Mount Brown;
  - Around a number of artificial wetlands;
  - In areas of open space.

#### *5.5.1.4 Threatened Flora and Fauna*

A number of threatened species listed on the TSC Act and/or EPBC Act were observed during the site inspections. The threatened species identified, however, were restricted to more mobile species such as bats and birds. There were no threatened amphibians, reptiles or mammals (excluding bats) recorded on the site. In addition, no Green and Golden Bell Frogs were observed at the site despite extensive targeted surveying.

#### *5.5.1.5 Potential Habitat*

Natural and artificial wetlands are present across the subject site, including two that are protected under NSW State Environmental Planning Policy 14 – Coastal Wetlands (SEPP 14). These wetlands occur in the south eastern portion of the site and are retained in the Concept Plan.

The numerous wetlands located throughout the study area provide potential habitat for a variety of species including birds, reptiles, mammals and amphibians. The largest wetland is located in the south west of the site and provides the greatest habitat value as it contains a variety of habitat features. This area is particularly important for a number of threatened and migratory species, including twelve threatened bird species and eighteen migratory bird species recorded during the site inspection.

The assessment also found that potential habitat is present within the subject site for eleven threatened flora species. Only one species, *Chorizema parviflorum* listed as an Endangered Population in Wollongong LGA, was found on the site during the targeted threatened flora searches.

#### *5.5.1.6 Assessment against Part 3A of the EP&A Act*

The proposal will result in EEC and wetland clearance and retention across the study area. As such, the EA assessed the proposal against Part 3A of the EP&A Act.

The proposal was considered to meet the 'maintain and improve' test under Part 3A as it:

> Will conserve all key habitat areas across the site through zoning for environmental protection;

> Will conserve the largest and most consolidated stand of vegetation in the south-east of the site;

> Will conserve the largest and most valuable artificial wetlands which provide habitat for threatened and migratory birds in the south east of the site and mitigation measures will be implemented to prevent indirect impacts;

> Implement a Vegetation Management Plan that will reduce the weed invasion in remnant vegetation across the study area and include substantial revegetation of Duck Creek and other riparian zones;

> Improve connectivity of the Duck Creek and regional corridors and will not fragment any current corridors;

> Result in approximately 187.63 ha of vegetation being protected across the study area which includes a number of EECs and two SEPP 14 wetlands; and

> Is unlikely to have a significant impact on any EPBC listed species.

The EA concluded that provided the recommended mitigation measures are implemented and environmental conservation areas are managed, it is unlikely that the proposal would result in a significant impact on any matters of National Environmental Significance (NES) listed under the EPBC Act.

### 5.5.2 Concept Plan Modification Impact Assessment

A BAR (Ecoplanning 2017) was prepared by an Accredited BioBanking Assessor (No. 76) from Ecoplanning under Part 7A of the TSC Act. The report has been undertaken to accompany the modification to the Concept Plan, approved under Part 3A of the EP&A Act, relating to the proposed mixed-use development over 3 precincts on the Tallawarra Lands. The aim of the report was to assess the direct impacts to the ecological values of the development site.

A large majority of the study area consists of 'cleared land' and 'weeds and exotics' with vegetation in a highly modified condition. The native vegetation communities identified in the assessment occurred in a modified – highly modified condition due to weed invasion, underscrubbing and grazing of livestock. As such, the majority of the vegetation in the study area was allocated a condition class of 'underscrubbed' or 'Lantana'.

Plot based vegetation survey data was captured and used for the assessment, and a targeted threatened species survey was also conducted (refer to **Appendix G**).

#### *5.5.2.1 Native Vegetation*

Four native vegetation types were identified in the study area. These communities include:

> Sydney Blue Gum X Bangalay – Lilly Pilly moist forest in gullies and on sheltered slopes, southern Sydney Basin Bioregion (PCT1245)

> Forest Red Gum - Thin-leaved Stringybark grassy woodland on coastal lowlands, southern Sydney Basin Bioregion (PCT838)

> Whalebone Tree – Native Quince dry subtropical rainforest on dry fertile slopes, southern Sydney Basin Bioregion (PCT1300)

> Swamp Oak floodplain swamp forest, Sydney Basin Bioregion and South East Corner Bioregion (PCT1232)

The total area of each vegetation type identified in the study area is displayed in **Table 5-11** below.

**Table 5-11 Vegetation Types and Zones and the Total Area within the Study Area and Subject Site**

| Vegetation type (NPWS 2002) | Plant community type (OEH 2017) | Threatened ecological communities | | Condition (Ancillary code) | Area within study area (ha) | Area within subject site (development lands) (ha) |
|---|---|---|---|---|---|---|
| | | EPBC Act | TSC Act | | | |
| Moist Box-Red Gum Foothills Forest (MU13) | PCT 1245 - Sydney Blue Gum x Bangalay - Lilly Pilly moist forest in gullies and on sheltered slopes, southern Sydney Basin Bioregion (SR652) | N | N | Under-scrubbed | 0.89 | 0.00 |
| | | | | Lantana | 22.20 | 2.55 |
| Coastal Grassy Red Gum Forest (MU23) | PCT 838 - Forest Red Gum - Thin-leaved Stringybark grassy woodland on coastal lowlands, southern Sydney Basin Bioregion (SR545) | CEEC | EEC | Under-scrubbed | 0.71 | 0.25 |
| | | | | Lantana | 2.22 | 0.99 |
| | | | | Scattered Paddock Trees | 0.30 | 0.12 |
| Lowland Dry-Subtropical Rainforest (MU4) | PCT 1300 - Whalebone Tree - Native Quince dry subtropical rainforest on dry fertile slopes, southern Sydney Basin Bioregion (SR662) | N | EEC | Lantana | 1.10 | 0.00 |
| Coastal Swamp Oak Forest (MU36) | PCT 1232 - Swamp Oak floodplain swamp forest, Sydney Basin Bioregion and South East Corner Bioregion (SR649) | N | EEC | Under-scrubbed | 0.57 | 0.33 |
| - | - | N/A | N/A | Cleared Land | 178.84 | 93.67 |
| | - | N/A | N/A | Weeds and Exotics | 11.11 | 2.81 |
| | - | N/A | N/A | Artificial wetland | 1.08 | 0.59 |
| **Total** | | | | | **219.02** | **101.31** |

A majority of the vegetation type has a moderate – high cover of woody weeds in the midstorey and has been mapped under the condition class ‘Lantana’. A small strip of vegetation along the western boundary of the study area has been mapped ‘underscrubbed’. This vegetation contains minimal *Lantana camara**, which has likely been removed in the past adjacent to the access road, allowing cattle to access and graze in the vegetation zone. This has prevented the establishment of native midstorey species.

The vast majority of the Central and North Shore Precincts are mapped as cleared land or weeds and exotics, with 97.07 ha (95.8%) of the 101.2 ha development footprint mapped as non-native vegetation. The most significant patches of native vegetation within the study area, on the northern boundary of the site, have been avoided and will not be impacted by the proposal. This retained vegetation is contiguous with a substantial remnant of native vegetation, zoned E2 – *Environmental Conservation*

#### *5.5.2.2 Other Vegetation*

Three other distinct vegetation assemblages were recorded within the development site; however, none are remnant vegetation types. These vegetation assemblages included:

- *Cleared land* – includes all cleared land on the site and is dominated by grasses and herbaceous weeds.
- *Weeds and exotics* – this vegetation consists predominately of woody weeds, which comprises 95-100% of the vegetation cover in the zone.
- *Artificial wetlands* – includes all permanent waterbodies within the study area.

#### *5.5.2.3 Threatened Species*

Ecosystem threatened species were predicted based on habitat surrogates, and a number of ecosystem credit species were predicted on the site. The ecosystem credit species predicted are provided in Table 4.1 of the BAR at **Appendix G**.

In accordance with Section 6.5.1.3(a) of the Framework for Biodiversity Assessment (FBA), each species was assessed to determine whether the species is likely to occupy the site based on habitat features and quality. To do this, threatened species, populations and migratory species recorded within 5 km of the development site were obtained from a search of the *Atlas of NSW Wildlife* (OEH 2017) and their likelihood of occurrence was assessed. The potential for each threatened species, population or migratory species to occur was then considered following review of available habitat within the development site.

The likelihood of occurrence assessment determined some of the candidate species as “not present” within the development site. The remaining candidates were assessed under Step 3 of the FBA, which involved a survey effort within and surrounding the development site, including a threatened flora survey in accordance with *NSW Guide to Surveying Threatened Plants* (OEH 2016). The survey found that the remaining candidates were either not present within the subject site or had low potential of being present within the subject site. The results of the survey are displayed in Figure 4.3 of the BAR at **Appendix G**.

#### *5.5.2.4 Direct Impacts*

Direct impacts to the ecological values of the development site are limited, as the majority of the development is associated with cleared land. However, direct impacts will occur to small areas of native vegetation. The proposed development will result in the clearing of 4.24 ha of native vegetation, which represents just 4.2% of the development site and 15.5% of the total native vegetation mapped within the study area. The assessment determined that completely avoiding the impacts to native vegetation is not considered feasible.

The proposal will also remove potential foraging and roosting/sheltering/breeding habitat for fauna. The assessment determined that the likelihood of the majority of threatened fauna utilising the subject site is considered low.

#### *5.5.2.5 Indirect Impacts*

Indirect impacts from the proposed development may include noise and/or erosion associated with the construction phase of the project. These impacts will be managed through the development of a CEMP.

#### *5.5.2.6 Onsite Measures to Avoid and Minimise Direct and Indirect Impacts*

As described above, the complete avoidance of impacts is not possible, despite the largest patches of on-site vegetation being avoided. Small, less viable patches of native vegetation are proposed to be impacted and as such, several measures were recommended in the assessment to reduce impacts where possible. These include:

> **Loss of Fauna Habitat** – A number of non-threatened species such as birds, arboreal mammals and amphibians are likely to be present at the development site. Appropriate pre-clearance protocols will be put in place at the time of construction to avoid and mitigate any potential harm or injury to these individuals. These protocols should be included as a component of the CEMP.

> **Construction Environmental Management Plan** – To avoid potential indirect offsite impact during construction, an appropriate erosion and sedimentation control plan should be in place following best practice protocols such as Landcom (2004). It is recommended that this is included in a site specific Construction Environmental Management Plan (CEMP), prior to any construction works taking place. The CEMP will be required to span the pre, during and post-construction period, and will include the above pre-clearance and fauna management protocols.

> **Landscape Planting** – A landscaping scheme using native species suitable for the site would be developed to accompany development applications for the Lands. The landscaping would help to reintroduce vegetation in areas of the site currently comprising cleared grass.

### 5.5.3 Mitigation Measures

#### *5.5.3.1 Conditions of Approval*

The Concept Plan Approval included a number of additional requirements for all future approvals under the Concept Plan Approval with regards to biodiversity as detailed in **Table 5-12**. These requirements are considered sufficient for assessment of the proposed modification.

**Table 5-12 Tallawarra Lands Concept Plan Conditions of Approval – Biodiversity**

| Tallawarra Lands Concept Plan Conditions of Approval | | |
|---|---|---|
| ***Schedule 3 – Future Environmental Assessment Requirements*** | | ***Response*** |
| Future Environmental Assessment Requirements | **10 Amended Vegetation Management Plan**<br>The first future application to Council shall be accompanied by an amended Vegetation Management Plan, which includes the following requirements:<br>a) Inspection of revegetated and weed managed areas by an appropriately qualified environmental expert to ascertain whether the works are self-sustaining. If they are self-sustaining, develop an ongoing management regime for these areas in perpetuity; and/or<br>b) The provision of a vegetation condition report prepared by an appropriately qualified environmental expert at the end of the initial five-year establishment period. The condition report shall outline additional management measures to be undertaken if after five years it is determined that the revegetated areas are not self-sustaining. The condition report shall also outline recommendations for the management in perpetuity of the areas covered by the VMP. | A VMP would be prepared to accompany the first future application. This would remain unchanged by this proposed modification. |

#### *5.5.3.2 Statement of Commitments*

Mitigation measures identified by the SoCs that are applicable to Biodiversity, and which would apply to the Modification proposal, are listed in **Table 5-13** below.

**Table 5-13 Tallawarra Lands Concept Plan Statement of Commitments – Biodiversity**

| Tallawarra Lands Concept Plan Statement of Commitments | | *Response* |
|---|---|---|
| Ecologically Sustainable Development | 12. Precinct scale and other major development applications consistent with the Concept Plan will demonstrate how they address the relevant desired sustainability outcomes contained in the Sustainability Report prepared by Urbis and dated October 2010. | Sustainability outcomes will be addressed within the individual Development Applications for any Precinct Scale and other major development applications submitted. |

| | | |
|---|---|---|
| Ecology | 18. TRUenergy commits to implementing the mitigation measures detailed in Table 12 of the Ecological Assessment report dated 4 March 2011. | BridgeHill commits to implementing the measures detailed with the Ecologocal report that accompanied the Concept Approval in addition to the requirements detailed within **Appendix G** |
| In perpetuity security of biodiversity outcomes | 18a. TRUenergy commits to entering into discussions with relevant authorities, or recognised private conservation land managers such as Bush Heritage Australia, to arrange for transfer of ownership of the areas of retained vegetation; and/ore<br>Dedicating the conservation lands to Wollongong City Council as reserves to be administered under the Local Government Act; and/ore<br>Establishing an in-perpetuity Property Vegetation Plan under the *Native Vegetation Act 2003*; and/or<br>Applying for Conservation Agreement under the *National Parks and Wildlife Act 1974*; and/or<br>Establishing a conservation covenant under *Nature Conservation Trust Act*; and/or<br>Securing in perpetuity the biodiversity outcomes of the retained vegetation of the E2 lands through other appropriate legal mechanism(s). | BridgeHill continues to commit to this commitment made by TRUenergy. |
| | 18b. TRUenergy commits to holding discussions with the relevant authorities (such as Lake Illawarra Authority and Wollongong City Council) about entering into possible Voluntary Planning Agreements (VPAs) involving future land ownership transfers, infrastructure provision, site remediation and implementation of the Vegetation Management Plan. Any VPAs entered into will specify the works to be undertaken, the party responsible for carrying out the works and the timeframe within which works will be undertaken. | BridgeHill commits to holding discussions with relevant authorities about entering into possible Voluntary Planning Agreements (VPAs) as discussed in the Statement of Commitments that accompanied the Concept Approval. |
| Ecology | 19. TRUenergy commits to implementing the Vegetation Management Plan prepared by Eco Logical dated 4 February 2011, unless other arrangements are made arising out of VPA discussions referred to in Commitment 18b. | |
| | 20. TRUenergy commits to implementing the Environmental Management Strategy prepared by Eco Logical dated 4 February 2011. | |
| | 21. TRUenergy commits to the recommendations detailed in Section 5.1 of the GDE Risk Assessment prepared by Eco Logical Australia dated 19 April 2012. | |

Biodiversity issues associated with the development of the Tallawarra Lands would be managed in accordance with the Concept Plan Approval and associated SoCs referred to above. These are considered adequate to address the potential impacts of the Modification Proposal.

## 5.6 Bush fire

A Bush fire Assessment has been prepared by Peterson Bush fire (2017) to address the SEARs, with the full assessment contained at **Appendix H**. The SEARs addressed in this section are identified in **Table 5-14**.

**Table 5-14 Secretary's Environmental Assessment Requirements (Bush fire)**

| Secretary's Environmental Assessment Requirements | Where Addressed |
|---|---|
| ***14. Bush fire*** | |
| ▪ The modification request shall demonstrate compliance with the relevant provisions of *Planning for Bush fire Protection 2006*. | **Section 5.6.2.3 and Appendix H** |

### 5.6.1 Tallawarra Lands Concept Approval

A Bush fire Assessment completed by Eco Logical Australia (ELA, 2011b) informed the Tallawarra Lands Concept Plan Approval. The Environmental Assessment (DFP, 2011) that informed the Concept Approval summarised this report, detailing the bush fire protection measures that would be required by the Approved Concept Plan. These measures specifically related to the location of Asset Protection Zones (APZs), APZ management, building construction standards and public road design.

This assessment required a detailed assessment of the vegetation types and coverage that occurs throughout the Tallawarra Lands site. The site has a diverse make up, with areas of forest, woodland, freshwater and saline wetlands. These zones are spread across the site with the wetlands occurring to the south of the Tallawarra Power Station and the forest/woodlands occurring around Mount Brown and the former storage areas associated with the Power Station. An assessment of slope was conducted in conjunction with the assessment of vegetation types, to enable the determination of APZ requirements. This investigation found slopes to be most prominent around Mount Brown, affecting the North Shore and Central Precincts.

**Figure 5-1** details the locations and dimensions of the APZs proposed for the Concept Plan Approval.

**Figure 5-1 Concept Plan Approval APZ Locations and Dimensions**

In addition to the APZ requirements detailed in the ELA (2011b) assessment, the report addressed the following measures that remain applicable to the proposed modification;

> APZ Fuel Management

> APZ Management Responsibility

> Perimeter access

> Building Construction

> Access, and

> Services

### 5.6.2 Concept Plan Modification Impact Assessment

The increase to the approved zone boundaries within the Concept Plan Approval has the potential to affect the assessment for bush fire risk discussed above. Peterson Bush fire has prepared a Bush fire Assessment (Peterson Bush fire, 2017) to achieve this requirement, with the full assessment contained at **Appendix H**. The following summarises the key findings of this Assessment and details any modifications that are required for bush fire protection throughout the North Shore and Central Precincts of the Tallawarra Lands.

#### *5.6.2.1 Background*

The bush fire assessment conducted by Peterson Bush fire investigated the impacts that the modification to the zone boundaries would have on the previous outcomes of the Bush fire Assessment conducted by Eco Logical Australia (ELA, 2011b). This specifically focused on the following;

> Identify the bush fire hazard affecting the proposal;

> Identify the bush fire protection measures required for the proposed modifications; and

> Inform the preparation of the EIS

These investigations were conducted to ensure compliance with the NSW Rural Fire Service (RFS) document *Planning for Bush fire Protection 2006* (PBP). The ELA (2011b) report was reviewed as part of the investigations undertaken and remains the technical bush fire assessment for the overall approved Concept Plan, with the Peterson Bush fire (2017) assessment providing the additional technical assessment for the areas of proposed modification consistent with the ELA (2011b) assessment.

#### *5.6.2.2 Assessment of Bush fire hazard*

##### 5.6.2.2.1 North Shore Precinct

The proposed modification will see the extension of residential lots upslope to the south towards the ridgeline. The modification does not alter the assessment provided within the ELA (2011b) report. The primary hazard for this Precinct lies at the western end of the Precinct in the vicinity of Mount Brown. Mount Brown is characterised by a forest covering, surrounded by cleared pasture that will remain cleared as open space. The pasture grass does not contain enough representation of native species for it to be classified as a grassland hazard.

A secondary bush fire hazard extends along the foreshore of Lake Illawarra at the northern boundary of the precinct. This vegetation consists of remnant patches of lake-side *Casuarina glauca* (She Oak) which are connected by extensive, advanced vegetation of open forest. This area was classified as ‘Low hazard’ by the ELA (2011b) report due to the constrained width of the corridor and the fact it does not connect to the other areas of bush fire hazard within the Tallawarra Lands. Whilst there is no proposed modification to the boundaries within this area, the classification of the hazard will be dependent on the final use of this corridor. Should the extensive vegetation remain it would produce a corridor greater than 50m wide and therefore constitute a forest hazard. A perimeter road has been included in the revised Concept Design that provides an appropriately sized APZ and access for firefighting. It is noted that the Concept Approved boundary is not proposed to change in this area.

#### 5.6.2.2.2 Central Precinct

The Central Precinct is exposed to bush fire hazards from the north-east, south and west, as well as a potential introduced hazard along a narrow riparian corridor within the centre of the Precinct. The proposed modifications to the Precinct occur along the eastern side where low density lots and large lot residential areas will push eastwards into cleared pasture areas. It is only the proposed large lots at the north-eastern corner of the Precinct that will be exposed to a bush fire hazard. These lots are large in size with adequate space for APZ's within lots and adequate access for firefighting purposes.

Other minor boundary alterations that are proposed to occur along the riparian corridor within the centre of the Precinct and adjoining open space in the south-western corner do not alter the hazard assessment presented within ELA (2011b).

### *5.6.2.3 Bush fire Protection measures*

The proposed modifications have been assessed against the provisions within PBP to ensure compliance can be achieved. These provisions require APZs and access to be assessed at the Concept Plan stage, with a range of further measures to be implemented at the various follow on stages of development. The following sections discuss the implications of the proposed modifications on these two requirements.

#### 5.6.2.3.1 Asset Protection Zones

Following an assessment of the site constraints associated with the proposed boundary modifications for each of the precincts the following APZ adjustments are required.

North Shore Precinct

> Only the southern boundary of the Precinct will be modified, consisting of an extension southwards towards the ridge. The western portion of the southern boundary will be adjacent to forest on an upslope requiring a minimum 20m APZ. The remainder of the southern boundary will be adjacent to cleared open space and therefore an APZ is not required. This APZ requirement is consistent with the ELA (2011b) assessment

> The increased density of lots along the northern boundary via a reduction of the lot size does not alter the APZ requirements of PBP.

Central Precinct

> The extension of the boundary to the east will primarily be into cleared open space where an APZ is not required. The exception is the north-east corner where large lots may adjoin vegetation in steep-downslopes. An APZ dimension has not been specified for the interface lots due to their large size and ability to accommodate an APZ at maximum dimension (i.e. 60 m). The final APZ dimension will depend on the location of a dwelling within the lot.

> The minor modification to the boundary in the south-western corner do not alter the APZ assessment within ELA (2011b). The minimum 10m APZ along the low hazard corridor remains valid and the southern and western interfaces so not require an APZ due to open space adjacent.

> The increased density of lots via reduction in lot size and enlargement of the R2 zone does not alter the APZ requirements of PBP.

All required APZs can be accommodated within the proposed modified Concept Plan extents. As such, the proposed modification complies with PBP. **Figure 5-2** and **Figure 5-3** show the locations and dimensions of the APZs that are required to be altered by the Modifications to the Approved Concept Plan.

**Figure 5-2 North Shore Precinct APZ Locations and Dimensions**

**Figure 5-3 Central Precinct APZ Locations and Dimensions**

#### 5.6.2.3.2 Access

A number of factors must be assessed regarding access arrangements as detailed within the PBP. The proposed modifications are assessed against these factors below;

Alternate access and egress

> The proposed modified concept layouts for both the North Shore and Central Precincts are assessed as having a logical public road configuration that will provide multiple access/egress points ensuring alternate directions for evacuation and response, thus demonstrating compliance with PBP.

Perimeter access

> All hazard interface locations with APZs have adequate access provided by way of public perimeter roads, thus demonstrating compliance with PBP.

Design and Construction Standards

> All public roads have been designed to allow compliance with the PBP design and construction standards as detailed in **Appendix H**. The Concept Layout for the two precincts is able to satisfy PBP access requirements.

### 5.6.3 Mitigation Measures

#### *5.6.3.1 Conditions of Approval*

The Concept Plan Approval included a number of additional requirements for all future approvals under the Concept Plan Approval with regards to bush fire as detailed in **Table 5-15**. These requirements are considered sufficient for assessment of the Proposed Modification.

**Table 5-15 Tallawarra Lands Concept Plan Conditions of Approval – Bush fire**

| Tallawarra Lands Concept Plan Conditions of Approval | | |
|---|---|---|
| ***Schedule 3 – Future Environmental Assessment Requirements*** | | ***Response*** |
| Rural Fire Service Requirements | **23 Location of buildings and facilities on Bush fire Prone Land to consider the requirement for Asset Protection Zones**<br>Future applications which include Bush fire Prone Land must be accompanied by bush fire assessment report which demonstrates that the development meets the requirements of *Planning for Bush fire Protection 2006.* | All development Applications that include bushfire prone land will be accompanied by a Bush fire assessment report. The design of the layout as detailed within the Modified Concept Plan have taken into account the requirements stipulated within *Planning for Bush fire Protection 2006.* |
| | **24 Bush fire protection for the access to the tourist facility**<br>Future applications for the tourist facility include a bush fire assessment report that demonstrates that development complies with Section 4.2.7 of *Planning for Bush fire Protection 2006*, including asset protection zones and roads. | The future application for development of a tourist facility will be accompanied by a bush fire assessment report that details that the requirements stipulated within *Planning for Bush fire Protection 2006* have been taken into account. |

#### *5.6.3.2 Statement of Commitments*

Mitigation measures identified by the SoCs that are applicable to Bush fire, and which would apply to the Modification Proposal, are listed in **Table 5-16** below.

**Table 5-16 Tallawarra Lands Concept Plan Statement of Commitments – Bush fire**

| Tallawarra Lands Concept Plan Statement of Commitments | | *Response* |
|---|---|---|
| Bush fire | 22. TRUenergy commits to implementing the recommendations and management measures contained in the Bush fire Planning Assessment prepared by Eco Logical Australia dated 4 February 2011. | BridgeHill will continue to commit to the recommendations and management measures contained in the Bushfire Assessment prepared by ELA (2011b) as well as the additional |

| | |
|---|---|
| | recommendations contained within the Peterson Bush fire Assessment (2017). |

Bush fire issues associated with the development of the Tallawarra Lands would be managed in accordance with the Concept Plan Approval and associated SoCs referred to above. There are considered adequate to address the potential impacts of the Modification Proposal.

## 5.7 Geotechnical

A Geotechnical Report was prepared by Cardno (2017b) to address the SEARs, with the full assessment contained at **Appendix I**. The SEARs addressed in this section are identified in **Table 5-17**.

**Table 5-17 Secretary's Environmental Assessment Requirements (Geotechnical)**

| Secretary's Environmental Assessment Requirements | Precinct | Comments |
|---|---|---|
| Impacts of potential earthworks however detailed assessment would be undertaken as part of future detailed DA | Central | There is a risk of erosion and disturbance of the soils during earthworks. Additional investigation / laboratory tests of erodibility of the soils is required prior to works commencing.<br>This area poses moderate risks, however, these can be managed by appropriate engineering design, to be determined by further intrusive investigation and assessment. It is anticipated that expanding the area poses limited slope instability risk for residential development following appropriate engineering design |
| | North Shore | There is a risk of erosion and disturbance of the soils during earthworks. Additional investigation / laboratory tests of erodibility of the soils is required prior to works commencing.<br>The expanded areas of the North Shore Precinct are not expected to have significant geotechnical constraints. |

### 5.7.1 Tallawarra Lands Concept Plan

A Geotechnical, Contamination and Ground Water Investigation Report for the Tallawarra Lands was prepared by Coffey Environments (2010) for the North Shore, Central and Southern precincts of the site. The objective of the report was to collect and collate information on contamination, geotechnical, groundwater and acid sulfate soil concerns. The geotechnical report was reviewed as part of the investigations undertaken and remains the technical geotechnical assessment for the overall approved Concept Plan, with the Cardno (2017b) assessment providing the additional technical assessment for the areas of proposed modification consistent with the Coffey (2010) assessment.

During the initial planning phase of the investigation for the site, a list of preliminary terrain units was formulated to better target the various areas of the site with subsurface investigation works. The preliminary terrain units were coded as follows:

> (A) – Ash Dams

> (B) – Undulating slopes

> (C) – Low lying with soft soils

> (D) – Steep slopes

A simple qualitative rating system was developed as part of the assessment to provide a broad indication of the relative difficulty for development from the geotechnical perspective within the various terrain units at the subject site. A summary of the geotechnical constraints taken from the report is provided in **Figure 5-4** below.

**Figure 5-4 Summary of Geotechnical Constraints based on Simple Qualitative Rating System**

| | |
|---|---|
| Green | Generally no significant geotechnical constraints to urban development within these areas. Further geotechnical assessment works required during planning and detailed design stages for future development.<br><br>The 'A' (Alluvial) and 'H-L' (Hillside – Lower) terrain units are included in this category. These areas of the site are more suited to either residential single or two storey housing or commercial type developments. Some earthworks required to develop housing over the Alluvial Terrain areas. |
| Yellow | Land requiring some geotechnical engineering assessment to design and construct standard urban developments such as residential subdivisions. More limited ground treatment necessary compared to 'Red' areas below. Development possible but would require input from the geotechnical engineer.<br><br>The 'F-3' (Ash Pond 3, <2m of Unit 5A soils), 'F-5' (General Fill), 'F-E1' (Fill over Unit 5A soils <2m thick) and 'E-1' (Unit 5A soils <2m thick) areas fall into this category. |
| Light Purple | Moderate risk (with some high risk) of landslide in these areas. Further detailed geotechnical assessment works would be necessary to further refine areas suitable for development. Some of this land may be excluded from future development.<br><br>The 'H-U' (Hillside – Upper) areas fall into this category. |
| Red | Land requiring significant geotechnical assessment to design and construct to urban development standard. Development could be possible but would likely require significant geotechnical remedial works. Detailed geotechnical advice during the planning and design stages would be required.<br><br>The 'F-1' (Ash Pond 1+2 with <2m of Unit 5A soils), 'F-2' (Ash Ponds 1+2 with >2m of Unit 5A soils), 'F-4' (Ash Pond 3 with >2m of Unit 5A soils), 'F-E2' (Fill overlying Unit 5A soils thicker than 2m) and 'E-2' (Unit 5A soils thicker than 2m) all fall into this category. |

The areas generally considered feasible for development from the geotechnical perspective were:

> The North Shore Residential Precinct

> The Display Village and Central Residential Precinct and the Local Centre, the northern sections of the Employment Lands, and the Tourism area

> Some areas of the Employment Lands and the western portions of the Lakeside Residential Precinct

The areas that are considered to be more technically challenging (from a geotechnical perspective) for development were:

> The remainder of the Employment Lands generally south of Yallah Bay Road and the Sports Ground.

> The Primary School and Retirement Living area and the remainder of the Employment Lands near the Primary School and Retirement Village, and the central and eastern parts of the Lakeside Residential Precinct.

#### *5.7.1.2 Site Investigation*

A site walkover to identify areas of environmental and chemical concern and geotechnical constraint was undertaken as part of the assessment. The following site investigations were conducted:

> A Geotechnical investigation which consisted of 86 test pits, 7 boreholes, 9 groundwater monitoring wells and 24 peizocones. The depth of investigation varied between 0.5m and 24m.

> 24 Cone penetration tests and pore pressure dissipation tests were carried out.

> A Shrink swell test, particle size distribution including hydrometer and the Attenberg Limits test with linear shrinkage were conducted on selected samples.

The Central Precinct was divided into two parts. The site adjacent to the proposed expansions was identified as Zone 2 (D) and the proposed modification site was identified as Zone 4(B) (D). The North Shore Precinct was identified as Zone 1 (B) and was adjacent to Zone 4 (B) (D).

Summaries of each of the zones are detailed in the subsections below.

#### *5.7.1.3 Central Precinct*

According to the ASS Mapping presented in the report, the Central Precinct was a 'No Known Occurrence' zone for ASS.

Rock depths within the Central Precinct were determined to be at 1.0m – 3.0m depth. An area of fill was identified during the study in the north west portion of the precinct, with an inferred depth of 1.0m – 2.0m.

The geotechnical assessment of the zones within the Central Precinct determined the following:

***Zone 4 (B) (D):***

> *"Upper steep slopes of hillside areas generally with slopes greater than about 10°, either colluvial and/or residual soils present in the areas. Soil cover generally less than 2m in most areas with some deeper areas near gullies overlying Budgong Sandstone."*

> *"Moderate Risk (with some high risk) of landslide in these areas. Further detailed geotechnical assessment works would be necessary to further refine areas suitable for development. Some of this land may be excluded from future development."*

#### *5.7.1.4 North Shore Precinct*

According to ASS Mapping presented in the report, the North Shore Precinct was also a 'No Known Occurrence' zone for ASS.

Rock depths were determined to be at 1.0m – 2.0m in depth. An area of fill was identified during the study in the north eastern portion of the site with an inferred depth of 1.0m – 2.0m.

The geotechnical assessment of the zones within the North Shore Precinct determined the following:

***Zone 1 (B):***

> *"Lower undulating footslopes of hillside areas, generally with slopes less than or equal to about 10°, either colluvial and/or residual soils present in the areas. Soil cover generally less than 2m in most areas with some deeper areas near gullies overlying Budgong Sandstone."*

> *"Generally no significant geotechnical constraints to urban development within these areas. Further geotechnical assessment works required during planning and detailed design stages for future development."*

### 5.7.2 Concept Plan Modification Impact Assessment

A Geotechnical Report was prepared by Cardno (2017b) to review geotechnical constraints associated with the Tallawarra Lands to address the SEARs requirements for the proposed modification to the Tallawarra Concept Plan. A site walkover and site investigation was conducted for the modification areas.

A summary of the investigations is provided in the subsections below.

#### *5.7.2.1 Central Precinct*

A site walkover was conducted which identified steep slopes within the Central Precinct. Although no dams were located within the expanded areas, several dams were located on site suggesting high ground water levels. The investigation also found existing structures located adjacent to the site.

Site investigations consisted of six (6) hand augured test pits. The encountered subsurface stratum and rock levels are detailed in Table 5-1 of the Geotechnical Report at **Appendix I**. The depth of sandstone levels were consistent with the subsoil investigation conducted by Coffey, and the geology was found to be consistent with the Wollongong Area Coastal Quaternary Geology Map.

Further intrusive investigation is recommended to confirm the extent of any instability prior to works being undertaken. The Central Precinct (expansion area) poses moderate risks; however, these can be managed by appropriate engineering design, to be determined by further intrusive investigation and assessment.

#### *5.7.2.2 North Shore Precinct*

During the site walkover, undulating slopes were observed in the North Shore Precinct. Several dams were also recorded within the precinct.

Site investigations consisted of ten (10) hand augured or excavated test pits. The encountered subsurface stratum and rock levels are detailed in Table 5-2 of the Geotechnical Report at **Appendix I**. The depth of sandstone levels were consistent with the subsoil investigation conducted by Coffey, and the geology was found to be consistent with the Wollongong Area Coastal Quaternary Geology Map.

The expanded areas of the North Shore Precinct are not expected to have major geotechnical constraints. The existing data provides sufficient geotechnical information at this stage to understand the geotechnical constraints. Consequently, the proposed expansion does not present further geotechnical constraint.

### 5.7.3 Mitigation Measures

#### *5.7.3.1 Statement of Commitments*

Mitigation measures identified by the SoCs that are applicable to Geotechnical, and which would apply to the Modification proposal, are listed in **Table 5-18** below.

**Table 5-18 Tallawarra Lands Concept Plan Statement of Commitments – Geotechnical**

| Tallawarra Lands Concept Plan Statement of Commitments | | *Response* |
|---|---|---|
| Geotechnical | 5a. TRUenergy commits to undertaking further geotechnical engineering assessment of those parts of the Concept Plan development footprint identified as being constrained in the Geotechnical, Contamination and Groundwater Investigation dated 30 July 2010, prepared by Coffey Environments. | Further Geotechnical Investigations will be undertaken as part of individual Development Applications for actual works on site. |

Geotechnical issues associated with the development of the Tallawarra Lands would be managed in accordance with the Concept Plan Approval and associated SoCs referred to above. These are considered adequate to address the potential impacts of the Modification Proposal.

## 5.8 Contamination

An Environmental Site Assessment (ESA) was prepared by Cardno (2017c) to address the SEARS, with the full assessment contained at **Appendix J**. Additionally, BridgeHill has engaged Easterly Point Environmental to act as the site auditor for the development of the site, with an Interim Site Audit Advice contained at **Appendix O**. The SEARs addressed in this section are identified in **Table 5-19**.

**Table 5-19 Secretary's Environmental Assessment Requirements (Contamination)**

| Secretary's Environmental Assessment Requirements | Response |
|---|---|
| ***10. Groundwater/Contamination/Acid Sulphate Soils*** | |
| The modification request shall:<br>• Undertake a review of the current hydrogeological setting, with an update of the remediation of contamination within the approved Concept area; | A Geotechnical Report has been prepared by Cardno (refer to **Appendix I**) to review the current hydrogeological setting on the site. |
| • Identify whether the proposed additional footprint comprises contaminated land or groundwater contamination and include a detailed description of the soil sampling methodology, any required remediation measures and ongoing site contamination management in accordance with *Contaminated Land Management Act 1997* (CLM Act) and the *Managing Land Contamination: Planning Guidelines*; | **Section 4-6** of **Appendix I** |
| • Include an updated investigation of AEC, including: | This requirement is not considered relevant to the ESA |

| | |
|---|---|
| ○ The potential for contaminants to be present in soil and groundwater in the vicinity of the ash ponds to be mobilised and transported to the adjacent shallow aquifer, duck creek and the receiving waters of Lake Illawarra and measures to address this, including the feasibility of remediation of contaminated soils and/or containment of contamination sources;<br>○ Potential for contamination in the vicinity of the Ash Ponds to adversely affects GDEs on the site;<br>○ Measures to ensure that the environmental attributes of conservation lands on the site are not adversely impacted upon by soil and groundwater contaminants;<br>○ Any risks to human health or the environment;<br>○ Recommendations for ongoing management of contaminated groundwater. | due to the considerable distance between the modification areas and the ash ponds to south. The ash ponds are not located in the North Shore or Central precincts. |
| • Provide verification by an auditor accredited under the CLM Act of the adequacy of the above investigation, effectiveness of any proposed remediation, and suitability of the site for the proposed modification in accordance with SEPP 55 – Remediation of Land; | An auditor has been engaged to review the investigation, with further details at **Appendix O** |
| • Assess and advise on the status of the contamination matters specified in Schedule 3 Future Environmental Assessment Requirements 11 and 12 of the Concept Approval and, if any of those requirements have been triggered, information on their progression; | Refer to discussion in **Appendix J** regarding the requirements of Schedule 3, Requirements 11 and 12. |

### 5.8.1 Tallawarra Lands Concept Plan

To inform the Concept Plan, Coffey Environments completed a Geotechnical, Contamination and Groundwater Investigation (2010) of the Tallawarra Lands. The objectives of the investigation were to obtain information in relation to geotechnical, contamination, groundwater and acid sulfate soil issues within the Tallawarra Lands to assess the feasibility of the Concept Plan. The scope of the investigation included a desktop study, intrusive site investigations to assess subsurface conditions, sampling and analysis of site soil and groundwater, interpreting data collected and reporting the findings.

#### *5.8.1.1 Contamination*

The contamination assessment identified nine potential AECs associated with potentially contaminating activities/sources that included:

> AEC 1 – Ash Ponds;

> AEC 2 – Other Fill Sources of Unknown Origin and Quality;

> AEC 3 – Weathering of Hazardous Building Materials, Pesticide Use, Chemical Storage;

> AEC 4 – Former Heggies Contractor Area;

> AEC 5 – Small Testing Laboratory and Coal Fired Oven;

> AEC 6 – Filling and Disposal of Waste in Farm Dams or Other Areas;

> AEC 7 – Weed Control;

> AEC 8 – Oil Skimmer Area; and

> AEC 9 – Access Road and Grassed Area.

The investigation identified soil contamination within AEC2, AEC3, AEC4, AEC8 and AEC9. The contamination identified exceeded human health investigation levels for residential with accessible soils. The contamination included asbestos and lead, arsenic, petroleum hydrocarbons and aldrin (pesticides). It is likely that the contamination is localised to the AEC and the associated activity, which may have caused the contamination.

The assessment determined that the potential for soil contamination to constrain the proposed Concept Plan is low, and that further investigation of the identified AECs that fall within the proposed development areas can be addressed at the time of any earthworks for subdivision. Areas outside of the AECs are not

suspected of having had activities that could have caused land contamination. Consequently, further assessment of these areas was not considered appropriate.

Elevated concentrations of zinc, copper and arsenic were reported at some locations exceeding the provisional based phytoxicity levels. This may indicate that some plant species sensitive to zinc and arsenic could be affected if this soil was used as a growing medium.

The former ash ponds were the largest potential AEC at the site. Elevated concentrations of heavy metals and ammonia were reported in groundwater collected from monitoring wells targeting the ash ponds. It is likely that the power station ash could be contributing to the contamination identified on the site, however, the natural surrounding environment cannot be ruled out as a potential source. As a result, further assessment would be required to determine the significance of the exceedances.

#### *5.8.1.2 Acid Sulfate Soils*

The results of the assessment indicate that acid sulfate soils are present within certain parts of the site. A combination of a desktop study, field mapping, logging and analytical testing was used to assess the extent of the site where acid sulfate soils could exist. These areas were predominately in the southern parts of the site with low lying alluvial/estuarine environments. The majority of these areas where the Concept Plan shows building zones coincide with the former ash ponds, and have already been filled or will most likely require filling to raise grounds levels due to flooding issues. Therefore, significant disturbance to underlying acid sulfate soils is unlikely and is not considered to pose a major constraint for redevelopment of the site based on the Concept Plan.

### 5.8.2 Concept Plan Modification Impact Assessment

An ESA was prepared by Cardno (2017c) to assess for potential contamination in portions of the North Shore and Central Precincts of the proposed Tallawarra Lands development that were not encompassed in the original Concept Approval. The following sections summarise the key findings of the assessment.

#### *5.8.2.1 Background*

The ESA forms a portion of the Modification request and specifically addresses the SEARs (as detailed in Section 1.5 of the assessment contained in **Appendix J**).

#### *5.8.2.2 Soil Analytical Results*

Fieldwork and soil sampling activities were undertaken by an experienced environmental scientist. Based on the soil analytical results, soils are impacted with Contaminants of Potential Concern (COPC) at concentrations above one of the Tier I screening values as summarised below:

> One soil sample reported a copper concentration that exceeds the NEPM EIL criteria for urban residential and public open space.

> Four soil samples reported copper at concentrations that exceed the NEPM EIL criteria for national parks and areas of high conservation value.

> Soil samples with elevated concentrations of copper were generally collected from the topsoil layer between surface and 0.2 m bgl, although one exceedance was reported at a depth of 1.0 m bgl.

> All samples that reported elevated copper in surface soils were collected from the Central Precinct and the sample with elevated copper at 1.0 m bgl was collected from the North Shore Precinct.

#### *5.8.2.3 Preliminary CSM and Risk Assessment*

During the assessment, a preliminary Conceptual Site Model (CSM) was developed to assess the fate and transport of COPCs relative to site specific subsurface conditions with regard to their potential risk to human health and the environment.

The assessment identified that there are currently no COPCs present in the Central and North Shore Precinct modification areas at concentrations above the Tier I human health screening values. Potential human receptors in the modification areas are currently limited to farm workers and workers completing maintenance on subsurface utilities.

Copper is present at the site at concentrations above the Tier I ecological screening values. Ecological receptors of significance were not identified at or within close proximity to the modification areas. The nearest significant ecological receptors are located outside of the Tallawarra Lands development footprint and include Duck Creek to the south and Lake Illawarra to the east and north. Therefore, the likelihood of a completed receptor pathway is unlikely under the current land use. If soil disturbance and earthworks are required during the proposed redevelopment of the site, potential mismanagement of excavated soil could result in a completed pathway.

The exceedances of the Tier I ecological screening levels were marginally above the criteria and concentrations were relatively consistent across the sampling locations indicating that they may be representative of background concentrations. The overall potential risk to the local environment based on the measured copper concentrations is considered low. A site auditor accredited under the Contaminated Land Management Act 1997, has been engaged by Bridgehill to provide audit services during the assessment and remediation of the site. The auditing provides an additional level of diligence to ensure a comprehensive assessment is undertaken.

### 5.8.3 Mitigation Measures

#### *5.8.3.1 Conditions of Approval*

The Concept Plan Approval included a number of additional requirements for all future approvals under the Concept Plan Approval with regards to contamination management as detailed in **Table 5-20**. These requirements are considered sufficient for assessment of the Proposed Modification.

**Table 5-20 Tallawarra Lands Concept Plan Conditions of Approval – Contamination**

| Tallawarra Lands Concept Plan Conditions of Approval | | |
|---|---|---|
| | ***Schedule 3 – Future Environmental Assessment Requirements*** | ***Response*** |
| Future Environmental Assessment Requirements | **11 Further investigation of the Areas of Environmental Concern and engagement of a Site Auditor accredited under the *Contaminated Land Management Act 1997***<br>Future applications that include those lands nominated as Areas of Environmental Concerns (AECs) in the Coffey Environments Report (2010) must be accompanied by a further environmental assessment report. In addition to adopting the recommendations contained in Section 12 of the Coffey Environments Groundwater Modelling Assessment report, the further investigations must consider:<br>• The potential for contaminants present in the soil and groundwater in the vicinity of the ash ponds to be mobilised and transported to the adjacent shallow aquifer, Duck Creek and ultimately to the receiving waters of Lake Illawarra, and measures to address this including the feasibility of remediation of contaminated soils and/or the containment of the sources of contamination;<br>• Measures to ensure that the environmental attributes of conservation lands on the site are not adversely impacted on by contaminants present in the soil and groundwater;<br>• Recommendations for the ongoing management of contaminated groundwater;<br>• The potential for the contamination present in soil and groundwater in the vicinity of the ash ponds to adversely affect groundwater dependent ecosystems on the site; and<br>• Any risks to human health or the environment.<br>Following the completion of the further investigations, the proponent must engage a Site Auditor accredited under the Contaminated Land Management Act 1997 to verify the adequacy of the investigations (and any proposed remediation) and certify that the site is suitable for the proposed use. | An ESA has been prepared by Cardno (2017) as described in **Section 5.8.3**.<br>The ESA has considered the potential for contaminants present in the soil and groundwater within the modification areas.<br>The ESA also outlines measures to address contaminants and ensure that the environmental attributes if conservation lands on the site are not adversely impacted.<br>Marc Salmon of Easterly Point Environmental Pty Ltd, a site auditor accredited under the Contaminated Land Management Act 1997, has been engaged by Bridgehill to provide audit services during the assessment and remediation of the site. An Interim Site Audit Advice is contained at **Appendix O**. |

| | | |
|---|---|---|
| | **12 Engagement of a site auditor to verify the adequacy of asbestos soil sampling and asbestos contamination investigations**<br>The first future application to Council must include a verification from a Site Auditor accredited under the *Contaminated Land Management Act 1997* to assess the adequacy of the investigations and asbestos soil sampling undertaken by Douglas Partners (July 2010) and certification of the suitability of the site for the proposed use. | An auditor called on to verify the adequacy of an investigation undertaken 7 years previously will almost certainly require that additional supplementary investigations be undertaken, which are of uncertain scope at this stage. Where remediation is required in order for any part of the site to be made suitable for its approved Concept Plan use, it will not be possible to obtain the required certification as to land use suitability at the superlot subdivision stage.<br>It is proposed to amend this condition to require site auditor verification and certification of site use suitability as part of any development application for subdivision of the land (excluding superlot subdivision). The certification of land use suitability should also be extended to allow a certification either that the land is suitable for the use *or can be made suitable for the use, subject to implementation of a RAP*, to allow for the possibility that some remediation works may need to be undertaken in conjunction with subdivision works. |

### *5.8.3.2 Statement of Commitments*

Mitigation measures identified by the SoCs that are applicable to contamination, and which apply to the Modification Proposal, are listed in **Table 5-21** below.

**Table 5-21 Tallawarra Lands Concept Plan Statement of Commitments – Contamination**

| Tallawarra Lands Concept Plan Statement of Commitments | | Response |
|---|---|---|
| Land Contamination | 6. TRUenergy commits to continuing investigations into the areas of environmental concern (AECs) identified in the Geotechnical, Contamination and Groundwater Investigation dated 30 July 2010, prepared by Coffey Environments. The AECs to be further investigated are those parts of the site that fall within proposed development areas. | An ESA has been provided to further investigate the areas of environmental concern within the proposed development areas (refer to **Appendix J**). |
| | 6a. TRUenergy commits to managing land contamination in accordance with State Environmental Planning Policy No. 55 – Remediation of Land and the Managing Land Contamination: Planning Guidelines. | The proposal complies with the provisions of SEPP 55 (as discussed in **Section 4.5.4**). |
| | 7. TRUenergy commits to undertaking any requirements for remediation and management as part of the findings from the further investigations of the AECs. | An ESA has been prepared that provides mitigation measures to be implemented for the remediation and management of contamination on the site (refer to **Appendix J**), |
| | 8. TRUenergy commits to implementing the recommendations detailed in the Preliminary Hydrogeological Assessment – Ash Ponds dated 23 November 2010, prepared by Coffey Environments. | The recommendations detailed in the Preliminary Hydrogeological Assessment – Ash Ponds will be implemented as part of |

| | |
|---|---|
| | construction works associated with the Lakeside Precinct. Energy Australia are retaining ownership of this parcel of land. |
| 9. The recommendations detailed in the Register of Hazardous Materials Report in Residences in North Shore Precinct dated 15 March 2010 prepared by Coffey Environments will be implemented. | The recommendations detailed in the Register of Hazardous Materials Report in Residences in the North Shore Precinct will be implemented to avoid any adverse environmental impacts. |

Contamination issues associated with the development of the Tallawarra Lands would be managed in accordance with the Concept Plan Approval and associated SoCs referred to above. These are considered adequate to address the potential impacts of the Modification Proposal.

## 5.9 Visual and Urban Design

A Visual Impact Assessment has been prepared for the North Shore and Central Precincts of the Tallawarra Lands by Cardno (2017d) to address the SEARs, with the full assessment contained at **Appendix K**. The SEARs addressed in this section are identified in **Table 5-22**.

**Table 5-22 Secretary's Environmental Assessment Requirements (Visual Impact Assessment)**

| Secretary's Environmental Assessment Requirements | Where Addressed |
|---|---|
| ***4. Visual Impacts*** | |
| The modification request shall provide a detailed visual impact assessment of the proposal from key viewpoints including views towards the site from Shellharbour LGA. The assessment shall provide a comparative analysis of the visual impacts of the proposed compared against the Concept Approval. | **Section 5.9.2 and Appendix K** |

### 5.9.1 Tallawarra Lands Concept Approval

Richard Lamb & Associates prepared a 'Visual, landscape and scenic resource management considerations report' (Lamb 2011) to inform the Tallawarra Lands Concept Plan Approval. DFP (2011) incorporated the outcomes of this report into the overall Environmental Assessment for the Tallawarra Lands, with Lamb (2011) recommending a range of visual and urban design considerations that should be reviewed in the development of the site.

To inform this report, an assessment of the existing character of the site was undertaken. The site is characterised by a rural setting, comprising mostly of grazing land on a varied topography. The Tallawarra power station and its associated distribution network provide a distinct industrial feel to certain aspects of the site. The site is elevated to the north with Mount Brown prominent with low-lying areas to the south along the Lake Illawarra foreshore. Other prominent features around the site include the various riparian creek lines and swamp vegetation, with some significant stands of vegetation.

Lamb (2011) divided the site into four scenic quality zones based on their intrinsic visual constraints, with visual exposure from external viewing locations, physical and natural features and their spatial arrangement with the immediate surrounding context. The visual catchment for the site was determined as being relatively large based on the proposed development on the slopes of Mount Brown being visible from the surrounding residential suburbs. Close viewing locations relate to Yallah Bay Road, the Princes Highway and public recreation areas along the Lake Illawarra Foreshore. Middle and distant views are available from the surrounding suburbs of Koonawarra, Kanahooka, Albion Park, Oak Flats, Shellharbour, Mt Warrigal, Windang, Primbee, Lake Heights and Berkeley. This is predominately a factor of the lakeside location of the Tallawarra Lands.

The visual impact of the proposed concept plan was then assessed from these locations to compare the existing situation with the proposed development. This assessment investigated the impact from a range of close, middle and distant views. This assessment found that the Approved Concept Plan would provide the following impacts;

> The proposed concept plan is compatible with the scenic resource management principles.

> In most views residential developments on the site will be seen in the context of the residential developments of the lakeside suburbs such as Koonawarra, Haywards Bay, Oak Flats, Shellharbour, Mt Warrigal and others and/or the suburbs of Dapto and Kanahooka.

> The employment uses (industry/business) are proposed on parts of the site with low external visual exposure and will not have any significant visibility for the external domain with the exception of some views from the south and southwest of the site.

> Other employment uses (neighbourhood centre and enterprise/business) are also proposed on parts of the site with limited external visual exposure.

> The proposed concept plan appropriately retains, adapts and enhances the scenic resources of the site which include Mount Brown slopes, ridgelines, creek lines, lake foreshore edge and water bodies.

> It provides for new visual and physical linkages and internal road networks that provide increased and improved access to internal scenic resources as well as externalises the site with the surrounding context.

> Views of the important ridgelines, high points and prominent slopes will be maintained by strategic location of residential development below the visual horizon at the finer grain.

> There would not be any significant interruption of existing views from the external domain. The view composition of part of the view comprising the site may alter, but the overall visual experience will not be affected.

### 5.9.2 Concept Plan Modification Impact Assessment

The precinct boundary modifications proposed to the Approved Concept Plan has the potential to alter the Visual Impact Assessment conducted by Lamb (2011). Cardno (2017d) have prepared a Visual Impact Assessment to assess the impact that any modification will have to both internal and external sensitive receivers within the vicinity of the Tallawarra Lands, specifically relating to the North Shore and Central Precincts. The full report is contained at **Appendix K**, and is summarised below.

The Lamb (2011) assessment conducted to inform the overall Concept Approval remains the primary study for the Tallawarra Lands site, with the Cardno assessment providing supplementary assessment to reflect the proposed modifications.

#### *5.9.2.1 Assessment of Modifications*

The proposed modifications will provide additional residential lots to be included within both the North Shore and Central Precinct. The North Shore Precinct will see the southern boundary to the R2 zone moved further south into the E3 zoned land. This alteration will see the zone boundary relocate to the south side of the ridgeline that runs from Lake Illawarra through to the summit of Mount Brown. Additionally, the existing high voltage electricity towers will be removed with the transmission lines redirected underground. The Central precinct modifications primarily comprise of boundary adjustments to the R5 land on the southern slopes of Mount Brown eastwards also into the E3 zoned land.

These changes were assessed through a photographic survey and the production of artist impressions to determine the overall impact of the changes. The artist impressions were produced by John Haycraft of Haycraft Duloy, Architectural Illustrators who were responsible for the impressions produced within the Approved Concept Plan. This approach allowed a more direct comparison to be made between the Approved Concept Plan and the proposed modifications.

Within the North Shore Precinct, most of the views towards the site include the Illawarra Escarpment as a continuous backdrop and horizon, which provides the dominant visual feature and limits sky lining of future development. The additional development would not impact on the visual significance of the Escarpment, which is recognised as being of high visual value by the *Visual Quality Analysis of Escarpment Scenic Values* (DSB Landscape Architects 2006) and *Illawarra Escarpment Heritage Assessment* (Mayne – Wilson and Associates 2007). These reports are reflected in the *Illawarra Escarpment Strategic Management Plan* (2005) and informed the *Illawarra Escarpment Land Use Review Strategy* (1 June 2007 and *Illawarra Escarpment Explanatory Document* 1 June 2007 (HLA Envirosciences Pty Ltd on behalf of Wollongong City Council). The DCP Chapter B6 recognises and aims to protect the visual character of the Escarpment. The

DCP Chapter B6 notes that the *Illawarra Escarpment Strategic Management Plan* recognises the 'significant scenic and aesthetic value of the Escarpment'. Conversely, the immediate visual context of the site comprising Mount Brown is not recognised in literature as a visually significant site. Consequently, impacts on local views are not considered to be major constraints.

The proposed modifications will result in additional detached dwellings located along the ridgeline extending east from Mount Brown, with a minor extension onto the north facing slope of the Precinct. These changes will be offset by the proposed removal of the high voltage electricity transmission towers. The Lamb report (2011) recommends that to preserve the visual quality of the locality, building envelopes should not extend beyond the horizon line. The view analysis undertaken within the Cardno (2017d) assessment found that in all available views towards the North Shore Precinct, the Illawarra Escarpment is a continuous horizon element. As such, single dwellings on the ridgeline resulting from this modification will be viewed against the backdrop of the Escarpment and will not form horizon views. With the removal of the electricity towers, it is assessed that the proposed modifications to the North Shore Precinct are acceptable with respect to their visual impact.

The modifications within the Central Precinct are characterised by the same backdrop of the Escarpment as described for the North Shore Precinct from both medium and distant viewing locations. When observed from close range, the proposed additional dwellings accessed from Carlyle Close will form the horizon line. These close range viewing points are observable from Yallah Bay Road, with it being assessed as not critical as they are incidental views only and the view would quickly open up with movement to the east to include Mount Brown and its surrounding vegetation. Additionally, the visual character of the area when viewed from Yallah Bay Road will undergo substantial change as a result of the development, with the additional dwellings on the ridgeline comprising a minor portion of this view.

The impact of additional dwellings along the ridgeline fronting Carlyle Close could be further controlled by requiring houses to be set back from Carlyle Close, as well as controls to cap building height and to carry out ridgeline tree planting. Other extensions in zone boundaries along the western and eastern precinct edges would have minimal impacts on the visual quality of the locality when compared to the approved Concept Plan.

#### *5.9.2.2 Recommendations*

Cardno (2017d) provided a number of recommendations to further ensure that the development of the Tallawarra Lands does not create visual impacts within the surrounding area. These recommendations included;

> Envelope and height controls should be mandated to minimise the visibility of new development along ridgelines. Specifically, new development accessed from Carlyle Close should be subject to setback and height controls to ensure that its visibility above the ridgeline is minimised.

> Existing vegetation on the site should be retained and enhanced where possible.

> Landscape treatment should include large forest scale trees, preferably of species endemic to the locality. These should be planted within lots and as street trees and should be concentrated on the higher lands and ridgelines where new development is likely to be most visible.

> A materials and colours palette should be included as part of a suite of development controls for the site. This should be aimed at minimising visual impacts of new built form.

### 5.9.3 Mitigation Measures

#### *5.9.3.1 Statement of Commitments*

Mitigation measures identified by the SoCs that are applicable to Visual and Urban Design, and which would apply to the Modification Proposal, are listed in **Table 5-23** below.

**Table 5-23 Tallawarra Lands Concept Plan Statement of Commitments – Visual and Urban Design**

| Tallawarra Lands Concept Plan Statement of Commitments | | |
|---|---|---|
| Urban Design Strategies | 10. The urban design strategies recommended in the Richard Lamb and Associates Visual, Landscape and Scenic Resource Management Considerations will be | BridgeHill commits to implementing the requirements stipulated within the Richard Lamb |

| | | |
|---|---|---|
| | reviewed and adopted for future development I the following areas of the Concept Plan site as identified in the Report:<br>• The large lot and central residential precinct in Visual Exposure Zone A and north shore residential precinct in Visual Exposure Zone B<br>• The lakeside residential precinct in Visual Exposure Zone D<br>• The employment in Visual Exposure Zones A and D | and Associates report that accompanied the Concept Approval and the additional requirements detailed within **Appendix K** |

Visual and urban design issues associated with the development of the Tallawarra Lands would be managed in accordance with the Concept Plan Approval and associated SoCs referred to above. These are considered adequate to address the potential impacts of the Modification Proposal.

## 5.10 European Heritage

A Statement of Heritage Impact has been prepared for the North Shore and Central Precincts of the Tallawarra Lands by Biosis (2017a) to address the SEARs, with the full assessment contained at **Appendix L**. The SEARs addressed in this section are identified in **Table 5-24**.

**Table 5-24 Secretary's Environmental Assessment Requirements (European Heritage)**

| Secretary's Environmental Assessment Requirements | Where Addressed |
|---|---|
| ***12. European Heritage and Aboriginal Cultural Heritage*** | |
| The modification request shall include a revised: | |
| • Heritage Impact Assessment prepared in accordance with the NSW Heritage Manual which addresses the significance of, and provides an assessment of, the impact on heritage significance of heritage items, landscape features and vegetation on the site and items in the vicinity, and | **Section 5.10.2 and Appendix L** |
| • Aboriginal Cultural Heritage Assessment in accordance with the *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW* (DECCW, 2011), and *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (DECCW). | **Section 5.11.2, Appendix M and Appendix N** |

### 5.10.1 Tallawarra Lands Concept Approval

A Statement of Heritage Impact for the Tallawarra Lands was completed by Biosis (2010a) to inform the Tallawarra Lands Concept Plan Approval. The Environmental Assessment (DFP, 2011) that informed the Concept Approval summarised this report, detailed the heritage management measures that would be required by the Approved Concept Plan. These measures are detailed below.

This assessment was conducted through an extensive review of the existing Commonwealth, State and local statutory and non-statutory registers to determine the presence of any known heritage features within the vicinity of the Tallawarra Lands. In conjunction with this search, research was conducted into the historical context of the site. This focused on the settlement patterns of the area, with the aim of identifying the location of land grants to determine the ownership arrangements and positioning of structures throughout the site. These two processes identified three (3) listed sites and 10 possible archaeological sites as detailed in **Table 5-25** located both within and in the immediate surrounds of the Tallawarra Lands.

**Table 5-25 Concept Approval list of European Heritage Sites**

| Secretary's Environmental Assessment Requirements | |
|---|---|
| ***Listed Heritage Items – Wollongong LEP 2009*** | |
| Mount Brown Reserve | Item No. 6339 |
| Military Bunker | Item No. 61016 |
| Yallah Homestead | Item No. 6437 |
| ***Listed Heritage Items – Wollongong LEP 2009*** | |

| | |
|---|---|
| TH1 | Existing Structure in the north west corner of the site, most recently a riding school. Possibly "O'Brien's House" present at least by 1916 |
| TH2 | Potential archaeological site near a large fig tree to the west of the site and adjacent to the Princes Higway. Possibly part of "Jordan's Farm" in the late nineteenth century. |
| TH3 | Potential archaeological site slightly to the north of TH2. Possibly part of "Jordan's Farm" in the late nineteenth century |
| TH4 | TH4 Potential archaeological site south of Duck Creek and adjacent to the Princes Highway. Possibly part of the Wollingurry Dairy, early 20th century |
| TH5 | Potential archaeological site south of Duck Creek and east of TH4. House known as "Wollingurry" situated on Wollingurry Dairy, early 20th century. |
| TH6 | Former Yallah Platform. Removed to Albion Park rail museum in 1980s. TH7 Former Smelting Company rail alignment (adjacent to the Study Area) |
| TH7 | Former Smelting Company rail alignment (Adjacent to the Study Area) |
| TH8 | Pair of existing tanks at the base of Mount Brown, built c.1950. |
| TH9 | A more widespread group of structures in the southern part of the Study Area; grouped together as the aerial photographs are unclear. Shown as "Beachgrove" in 1970s and possibly part of Wollingurry Dairy, early 20th Century. |
| TH10 | Group of structures east of TH6. Shown as "Roscommon" in the 1970s and possibly part of Wollingurry Dairy, early 20th Century. |

The initial study conducted by Biosis (2010a) indicated that only TH1-6 and TH8-10 occurred within the study area and would potentially be affected by the developable areas of the Approved Concept Plan. The Biosis study (2010a) recommended the following measures be put in place to ensure that impacts to heritage items are minimised;

1. Where practicable, avoid impact to all identified heritage items and archaeological sites. Those sites have been identified as: TH1, TH2, TH3, TH4, TH5, TH9 and TH10. The area to the east of the concrete house (LEP Item 6437) may also be archaeologically sensitive.
2. Prepare an archaeological assessment for each potential archaeological site (including the area around the Concrete House) if impacts are unavoidable. This would include areas which are not built upon but will be affected by landscape works, infrastructure, road making, etc., depending on impacts to the landscape and ground levels. The appropriate stage for the preparation of archaeological assessments would be after Project Application and prior to construction commencing.
3. There is existing road and rail corridor infrastructure on the site which can inform the location of new roads through the development. It is recommended that when designing the street layout and street hierarchy of the development the reuse of these alignments are considered.
4. There are historical road and boundary alignments which are no longer visible on the ground (for example the boundaries and road through "Jordan's Farm") which could also inform the layout of streets and blocks within the study area.
5. If significant variations occur, for example a significant increase in or relocation of development areas, then a reassessment of the impact of the development may be required. Depending upon the location any such variations, additional archaeological survey and assessment by a qualified heritage consultant may be required.
6. Consult with the cultural heritage specialists if intending to do any invasive work on site (e.g. geotechnical investigation) in areas identified as heritage items or as potential archaeological sites.
7. Determine an interpretation strategy (location, content, design) as part of the subsequent detailed project application.

### 5.10.2 North Shore and Central Precinct Statement of Heritage Impact

The modifications to the boundaries for the North Shore and Central Precincts within the Concept Plan Approval has the potential to affect the assessment of European Heritage Impact discussed above. Biosis has prepared an updated Statement of Heritage Impact that focuses on the North Shore and Central

Precincts (Biosis, 2017a) to ensure that no further impacts occur to the surrounding heritage features. The full assessment is contained at **Appendix L**. The following summarises the key findings of this assessment and provides an updated Statement of Heritage Impact that relates to the modified North Shore and Central Precincts.

#### *5.10.2.1 Background*

The *Tallawarra Lands, Northern and Central Precincts: Statement of Heritage Impact* prepared by Biosis (2017a) investigated the impacts that the modification to the zone boundaries would have on the previous outcomes of the Statement of Heritage Impact conducted by Biosis (2010a). This specifically focused on the following:

> Identify and assess the heritage values associated with the study area. The assessment aims to achieve this objective through providing a brief summary of the principle historical influences that have contributed to creating the present – day built environment of the study area using resources already available and some limited new research.

> Assess the impact of the proposed works on the cultural heritage significance of the study area.

> Identifying sites and features within the study area which are already recognised for their heritage value through statutory and non-statutory heritage listings.

> Recommend measures to avoid or mitigate any negative impacts on the heritage significance of the study area.

This assessment was conducted in accordance with current heritage guidelines including *Assessing Heritage Significance* (NSW Heritage Office, 2001), *Assessing Significance of Historical Archaeological Sites and "Relics"* (NSW Heritage Branch, Department of Planning, 2009) and the *Burra Charter* (Australia ICOMOS, 2013). The Biosis (2010a) report was reviewed as part of the investigations undertaken and remains the overall Statement of Heritage Impact for the overall approved Concept Plan, with the Biosis (2017a) assessment providing additional focused assessment for the areas of proposed modifications consistent with the Biosis (2010a) assessment.

#### *5.10.2.2 Assessment of Heritage Impact*

The methodology undertaken for the updated report replicated that undertaken previously, with a review of Commonwealth, State and Local statutory and non-statutory registers and further research into the sites history. This approach allowed for further information to be incorporated into the initial study following ongoing research in this area.

This review identified that four of the identified potential archaeological sites lie in or adjacent to the North Shore and Central Precinct. **Table 5-26** details these four locations within the study area.

**Table 5-26 Summary of heritage values associated with the study area**

| Item No. | Description | Date | Location |
|---|---|---|---|
| TH1 | Existing structures in the north west corner of the Northern Precinct visible from 1949 to present, most recently a riding school.<br>"O'Brien's House" identified present at least by 1916, appears to have been located 200 metres west of the present day structures and have been removed during the 1950s. Area is currently marked by a stand of trees. | c.1949 – present<br>c.1905 – c.1950 | North Shore Precinct |
| TH2 | Series of buildings near a large fig tree to the west of the site and adjacent to the Princes Highway. Likely to have been constructed following the 1905 formation of the Lakelands Estate. | c.1949 – c,1994 | Central Precinct |
| TH3 | Series of buildings slightly to the north of TH2. Likely to have been constructed following the 1905 formation of the Lakelands Estate. | c.1949 – c,1994 | Central Precinct |

| | | | |
|---|---|---|---|
| TH7 (Former Railway Alignment) | Former alignment of the Illawarra Harbour & Land Corporation Railway that borders the North Shore Precinct. | c.1897 | North Shore Precinct |

To assess the heritage significance of these areas, a site inspection was undertaken by Biosis with the aim of identifying heritage values associated with the study area. This inspection found that no evidence remains of these former site uses above ground, with the only discernible remains relating to the location of significant stands of vegetation that relate to former household gardens. Areas TH1-3 were identified as being associated with the 1905 subdivision of the land, with the structures being constructed after this date. The existing building at TH1 was assessed as being from the 1930's and not holding significant heritage value. O'Brien's House, which is located adjacent TH1 is associated with an earlier period of occupation of the site. The probable house location has no physical structures remaining. Biosis (2017a) has indicated that this style of occupation has many similar remaining examples throughout the Illawarra and wider NSW. Coral Vale, which is located to the West of the site, being an example of this.

TH7 relates to the former alignment of a railway line that ran to Tallawarra Point adjacent to the North Shore Boundary. No physical evidence of this alignment remains in this area, with other portions of the line locally listed within the West Dapto area. As such, these potential archaeological deposits were assessed as having a low potential.

The three registered heritage items in the vicinity of the study area were also assessed to determine the impact that the proposed modifications to the Concept Plan would have on these items. **Table 5-27** discusses these impacts.

**Table 5-27 Assessment of impacts to heritage items either within or adjacent to the study area**

| Heritage Item | Significance | Discussion | Assessment | Mitigation Measures |
|---|---|---|---|---|
| Mount Brown Reserve | Local | The proposed North Shore and Central Precincts will not impact directly upon the Mount Brown Reserve, however they will result in an impact upon lines of sight from and to the reserve, specifically to and from the Lake Illawarra foreshore and escarpment. The proposed subdivision, specifically the proposed modification in the North Shore and Central Precinct is located on the northern slope and lower foothills of Mount Brown and will not be visible from many points within the Mount Brown Reserve. This is consistent with the level of impact to the item under the Concept Approval. | Indirect – visual | None |
| Military Bunker | Local | The Military Bunker is located outside of the study area within a heavily vegetated area and is not visible from either the Central or North Shore Precinct. As such, the development and specifically the modification will not impact upon this heritage item. | No impact | None |

#### *5.10.2.3 Statement of Heritage Impact*

Biosis (2017a) provided the following Statement of Heritage Impact as a result of the proposed modifications to the Tallawarra Lands Concept Approval;

> *"The proposed modification will have a minimal impact upon the historical heritage values associated with the study area. The project will result in an indirect aesthetic impact upon the significance of Mount Brown Reserve, specifically views to and from the item. The North Shore Precinct is adjacent to the heritage item, with development within this location isolated to the northern slope, which will reduce the level of impact to views from the item. The Military Bunker is located within a heavily vegetated area and the proposed modification will have no impact to the item. The study area was identified to contain four sites, TH1, TH2, TH3 and O'Brien's Farm which have been assessed as not possessing any significance. Impacts to potential archaeological remains, if they are encountered these can be managed through an unexpected finds procedure during construction works.*
>
> *The project has been assessed as being acceptable from a heritage perspective."*

### 5.10.3 Mitigation Measures

#### *5.10.3.1 Conditions of Approval*

The Concept Plan Approval included a number of additional requirements for all future approvals under the Concept Plan Approval with regards to heritage management as detailed in **Table 5-28**. These requirements are considered sufficient for assessment of the Proposed Modification.

**Table 5-28 Tallawarra Lands Concept Plan Conditions of Approval - Heritage**

| Tallawarra Lands Concept Plan Conditions of Approval | | |
|---|---|---|
| ***Schedule 3 – Future Environmental Assessment Requirements*** | | ***Response*** |
| Future Environmental Assessment Requirements | **8 Cultural Heritage Management Plan**<br>The first future application to Council (refer to condition A6) shall be accompanied by a Cultural Heritage Management Plan that details how impacts on Aboriginal and non-Aboriginal heritage across the entire site will be minimised and managed. The plan shall include, but not necessarily be limited to:<br>a) Specific measures to be applied to works undertaken in close proximity to identified Aboriginal and non-Aboriginal heritage items to minimise and avoid impacts on these items;<br>b) How heritage items (Aboriginal objects and relics or works) discovered during the construction of the project will be considered and managed. This shall include a component within the site induction program for construction workers on Aboriginal and non-Aboriginal heritage within the project area;<br>c) Stop-work and notification procedures to be implemented should any unexpected impact archaeological deposits and/or State significant relics not previously identified be discovered;<br>d) A procedure for continued consultation with the relevant Aboriginal stakeholders; and<br>e) Procedures to be followed should non-compliance against any of the provisions of the management plan occur.<br>All future application must demonstrate how they will implement the Cultural Heritage Management Plan. | A Cultural Heritage Management Plan would be prepared to accompany the first future application. This would remain unchanged by this proposed modification. |

#### *5.10.3.2 Statement of Commitments*

Mitigation measures identified by the SoCs that are applicable to Heritage management, and which would apply to the Modification Proposal, are listed in **Table 5-29** below.

**Table 5-29 Tallawarra Lands Concept Plan Statement of Commitments – European Heritage**

| Tallawarra Lands Concept Plan Statement of Commitments | | Response |
|---|---|---|
| European Heritage | 17. TRUenergy commits to implementing the management recommendations in Section 7.2 of the *Statement of Heritage Impact: Tallawarra Lands Part 3A*, prepared by Biosis Research, dated September 2010.<br>TRUenergy commits to obtaining assessments of significance / assessments of archaeological potential in relation to sites TH2, TH3, TH4, TH5, TH9 and TH10.<br>TRUenergy commits to ensuring that if substantial intact archaeological deposits and/or State significant relics not previously identified are discovered, work will cease in the affected area(s), the Heritage Council will be notified and the required assessment / approval will be sought prior to works continuing in the affected area(s). | BridgeHill commits to implementing the recommendations contained within the initial investigation undertaken for the Concept Approval in addition to the recommendations contained within **Appendix L** |
| Heritage | 17a. TRUenergy commits to preparing a Heritage Management Plan detailing how construction impacts on Aboriginal and non- | BridgeHill commits to implement the requirements stipulated within |

| | |
|---|---|
| Aboriginal heritage will be minimised and managed. The Plan shall include, but not necessarily be limited to:<br>i. Specific measures to be applied to works undertaken in close proximity to identified Aboriginal and non-Aboriginal heritage items and "Defined Areas of Aboriginal Sensitivity" to minimise and avoid impacts on these items;<br>ii. How heritage items (Aboriginal objects and relics or works) discovered during the construction will be considered and managed. This shall include a component within the site induction program for construction workers on Aboriginal and non-Aboriginal heritage within the site area;<br>iii. Stop-work and notification procedures to be implemented compliant with Heritage Office and OEH guidelines should any unexpected intact archaeological deposits and/or State significant relics not previously identified be discovered; and<br>iv. The procedure for continued consultation with the relevant Aboriginal stakeholders. | the TRU energy statement of commitments 17a. |

Heritage issues associated with the development of the Tallawarra Lands would be managed in accordance with the Concept Plan Approval and associated SoCs referred to above. These are considered adequate to address the potential impacts of the Modification Proposal.

## 5.11 Aboriginal Heritage

Archaeological Reports and Aboriginal Cultural Heritage Assessments have been prepared for both the North Shore and Central Precincts of the Tallawarra Lands by Biosis (2017) to address the SEARs, with the assessments for the North Shore Precinct contained at **Appendix M** and the assessments for the Central Precinct contained at **Appendix N**. The SEARs addressed in this section are identified in **Table 5-30**.

**Table 5-30 Secretary's Environmental Assessment Requirements (Aboriginal Heritage)**

| Secretary's Environmental Assessment Requirements | Where Addressed |
|---|---|
| ***12. European Heritage and Aboriginal Cultural Heritage*** | |
| The modification request shall include a revised: | |
| • Heritage Impact Assessment prepared in accordance with the NSW Heritage Manual which addresses the significance of, and provides an assessment of, the impact on heritage significance of heritage items, landscape features and vegetation on the site and items in the vicinity, and | **Section 5.10.2 and Appendix L** |
| • Aboriginal Cultural Heritage Assessment in accordance with the *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW* (DECCW, 2011), and *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (DECCW). | **Section 5.11.2, Appendix M and Appendix N** |

### 5.11.1 Tallawarra Lands Concept Approval

To inform the Concept Plan Approval, Biosis completed an extensive assessment of the Aboriginal heritage of the Tallawarra Lands. The Report, Tallawarra Lands: Part 3A Concept Plan Aboriginal Archaeological Assessment (Biosis, 2010b), was summarised in the Environmental Assessment (DFP, 2011) that informed the Concept Approval. The Biosis (2010b) Assessment made a number of recommendations and mitigation measures, which were adopted in the Statement of Commitments that apply to the entire site.

The Biosis (2010b) Archaeological Assessment encompassed the following:

> **Aboriginal Consultation** – Biosis established a consultation process to engage with a range of Aboriginal Stakeholders that had expressed an interest in the site. This process was conducted in accordance with established guidelines at the time. This process ensured that the Aboriginal community were provided an opportunity to express a view about the methodology to be employed throughout the study of the Aboriginal Heritage values of the Tallawarra Lands site. This process continued throughout the assessment process, with the Aboriginal community invited to participate with archaeological investigations and to provide comment on all findings before processes were finalised.

- **Review of Heritage Registers and Planning Documents** – A search of all applicable databases and heritage registers was undertaken to determine the known Aboriginal Heritage sites within the Tallawarra Lands. This process identified 9 sites within the Tallawarra Lands site boundary within the Aboriginal Heritage Information Management System (AHIMS)
- **Investigation of site geology** – An assessment of the environmental background of the site was conducted providing context for the archaeological assessment and sub-surface investigations. The study area is characterised by its lake front position and its interface with the various tributaries that flow from the Escarpment. Mount Brown is prominent within the site with a significant ridge line running from the lake in an east-west direction to the top of Mount Brown. These features provide an abundance of different food sources based off the estuarine quality of the lake and the interface lands along creek lines. Mount Brown provides a significant land mark that is symbolic in Aboriginal culture.
- **Investigation of local Aboriginal Archaeology** – A review of the known Aboriginal Archaeological context of the local area. This investigation focused on developing local land use patterns to aid in the determination of areas of archaeological potential. This review highlighted the potential of the Mount Brown ridgeline and the areas where two different environments met. This review highlighted four previously identified Potential Archaeological Deposit (PAD) sites throughout the Tallawarra Lands.
- **Fieldwork** – To determine the potential of the PAD sites a series of 73 test pits was undertaken across 10 different sites. These sites were chosen based on the location of PADs and to test the different landform types throughout the site to establish historic land use patterns. A total of 24 Aboriginal stone artefacts and one small piece of ochre were uncovered. These artefacts predominately came from the creek and drainage line land formations. This process established eight new Aboriginal Archaeological Sites throughout the Tallawarra Lands. The Assessment at **Appendix M** details the revised PAD sites and Archaeological sites following the Biosis (2010b) assessment.
- **Findings Significance Assessment** – An assessment of the identified sites, from both the listed sites and from site investigations, was conducted against the significance values outlined in the Australia International Council of Monuments and Sites (ICOMOS) Burra Charter (Australia ICOMOS 1999). An assessment of significance was conducted for each of the identified sites, with all sites having a high Aboriginal Stakeholder cultural value; and a range of sites identified as having a low or moderate assessment of significance for Archaeological or scientific value.
- **Impact Assessment** – The assessment concluded with an assessment of the Concept Plan against the identified Aboriginal Heritage sites. This assessment identified each of the elements of the Approved Concept Plan and what impacts, if any, this would have on the identified Aboriginal Heritage. This information is contained within Table 58 of Biosis (2010b).
- **Site Management processes and recommendations** - The Assessment concluded with a range of recommendations and mitigation measures. These are detailed below;
  - Conservation through Avoidance. This is the primary mitigation and management strategy. As noted by Biosis, the Concept Plan has been refined to take in to account Aboriginal Heritage where possible.
  - Direct Impacts to known archaeological sites. Where registered Aboriginal archaeological sites, PADs and areas of high archaeological sensitivity cannot be avoided, further archaeological investigation will be required, including excavation and recording, to determine the archaeological and cultural significance of the site prior to ground disturbance. Where artefacts are recovered or require relocation, a Care and Control Agreement should be developed and implemented in consultation with registered Aboriginal stakeholders.
  - Aboriginal stakeholder consultation. This has commenced and further consultation will be required as noted in Biosis report.
  - Ongoing management. To successfully manage and mitigate Aboriginal cultural heritage within the Study Area, an Aboriginal Cultural Heritage Management Plan (ACHMP) should be developed, in consultation with relevant Aboriginal stakeholder groups and DECCW. This would consider the management and mitigation of Aboriginal cultural heritage at key stages of future development, including construction, and vegetation remediation/rehabilitation. The ACHMP will incorporate contingency plans to manage Aboriginal cultural heritage within the Study Area.

- Cultural heritage awareness training.
- Procedures for unanticipated Aboriginal sites identified during works
- Procedures for discovery of human remains identified during works.

### 5.11.2 Concept Plan Modification Impact Assessment

The proposed boundary increases contained within this modification of the Concept Plan Approval have the potential to impact further on Aboriginal Heritage items within the vicinity of the North Shore and Central precincts. Biosis has prepared two archaeological assessments and two Aboriginal cultural heritage assessments to meet this requirement, with the full assessments contained at **Appendix M** and **Appendix N**. The following sections summarise the key findings of these assessments. The methodology employed for these reports followed the methodology followed during the initial Concept Plan assessment, with minor modifications to allow for current guidelines.

These reports should be read in conjunction with the initial Tallawarra Lands Concept Plan Aboriginal Archaeological Assessment (Biosis, 2010b). This report remains the overarching assessment of the entire Tallawarra site, with the four Biosis assessments providing site specific advice for the North Shore and Central Precincts.

#### *5.11.2.1 North Shore Precinct*

Biosis (2017b) conducted a review of archaeological studies that have been undertaken throughout the vicinity of the North Shore Precinct since the completion of the initial Tallawarra lands Archaeological Assessment that informed the Concept Plan. Two further studies have been undertaken in the area since this time, with both relating to works along the Lake Illawarra Foreshore for a bike and pedestrian path. These studies identified two new PAD areas and one new artefact scatter at Tallawarra Point. A search of AHIMS database was undertaken, with two sites located within the North Shore Precinct.

An archaeological survey was undertaken throughout the Precinct to attempt to re-identify the Aboriginal archaeological sites identified within the AHIMS search and to undertake a systematic survey of the study area targeting areas with the potential for Aboriginal Heritage. A total of 5 transects were walked on the 29th June 2017 that did not yield any new Aboriginal sites or artefacts. Section 4 of the Archaeological Report **Appendix M** contains further details of this survey. This survey led the Biosis (2017b) assessment to conclude that the majority of the North Shore Precinct has a low Archaeological potential, with the ridgeline running from Lake Illawarra through to Mount Brown having a medium Archaeological potential.

Biosis (2017b) conducted a significance assessment against the two Aboriginal sites identified through the AHIMS search, with this assessment finding the sites to be of low scientific significance as discussed within **Table 5-31**. These two sites were predicted to be directly impacted by the proposed layout of the North Shore Precinct, with a total loss of value.

**Table 5-31 Statements of scientific significance for archaeological sites recorded within the study area.**

| Site Name | Statement of Significance |
|---|---|
| **Boomberry Point 1 52-5-0223** | This site consisted of shell midden containing one shell species. The site was exposed on the side of a track in a hill slope landform. The site was noted to be badly disturbed with highly fragmented shell. The site has been assessed as having low archaeological significance. |
| **Elizabeth Point 1 52-5-0225** | Elizabeth Point (52-5-0225) was recorded as an isolated stone artefact located on a walking track. The artefact was a grey chert flake piece, common in the region and was observed to have been disturbed by the walking track. The site has been assessed as having low archaeological significance. |

#### 5.11.2.1.2 North Shore Precinct Recommendations

> **Recommendation 1**: Further archaeological assessment is required in areas of moderate archaeological potential

Areas identified as having high and moderate archaeological potential should be avoided wherever possible (Figure 10 of **Appendix M**). If impact to these areas cannot be avoided subsurface investigations (test excavations) will be required prior to the commencement of works as a condition of

the DA or concept approval. Test excavations should be conducted in accordance with the *Code of Practice for archaeological investigation for Aboriginal objects in NSW* (DECCW 2010b) and *Aboriginal cultural heritage consultation requirements for proponents in New South Wales* (DECCW 2010c).

> **Recommendation 2**: No further archaeological assessment is required in areas of low archaeological potential

No further archaeological work is required in areas identified as having low archaeological potential except in the event that unexpected Aboriginal sites, objects or human remains are unearthed during development (refer to Recommendations 6 and 7 below).

> **Recommendation 3**: Fencing of AHIMS sites

AHIMS sites or PAD areas located within 30 metres of the area of proposed works should be clearly marked and fenced in order to avoid unintentional impacts during construction.

> **Recommendation 4**: Aboriginal cultural heritage induction for workers and contractors

The locations of each AHIMS site and PAD area located within the Tallawarra Lands development should be clearly mapped. Workers and contactors working at, or visiting the site should be made aware of the location of all AHIMS sites and PAD areas within the Tallawarra Lands development through an Aboriginal cultural heritage induction.

> **Recommendation 5**: Application for an Aboriginal heritage impact permit (AHIP)

Should the Development Application (DA) be approved, it is recommended that an application be made to OEH for an AHIP to destroy the listed Aboriginal sites within the study **The AHIP should be for a term of ten (10) years.** The sites that will be impacted by the proposed works are as follows:

- Boomberry Point 1 (AHIMS 52-5-0223)
- Elizabeth Point (AHIMS 52-5-0225)

> **Recommendation 6**: Discovery of Unanticipated Aboriginal Objects

All Aboriginal objects and places are protected under the *NSW National Parks and Wildlife Act 1974*. It is an offence to knowingly disturb an Aboriginal site without a consent permit issued by the OEH. Should any Aboriginal objects be encountered during works associated with this proposal, works must cease in the vicinity and the find should not be moved until assessed by a qualified archaeologist. If the find is determined to be an Aboriginal object, the archaeologist will provide further recommendations. These may include notifying the OEH and Aboriginal stakeholders.

> **Recommendation 7**: Discovery of Aboriginal Ancestral Remains

Aboriginal ancestral remains may be found in a variety of landscapes in NSW, including middens and sandy or soft sedimentary soils. If any suspected human remains are discovered during any activity you must:

1. Immediately cease all work at that location and not further move or disturb the remains
2. Notify the NSW Police and OEH's Environmental Line on 131 555 as soon as practicable and provide details of the remains and their location
3. Not recommence work at that location unless authorised in writing by OEH.

> **Recommendation 8**: Continued consultation with the registered Aboriginal stakeholders

As per the *Aboriginal cultural heritage consultation requirements for proponents 2010* (DECCW 2010a), it is recommended that the proponent provides a copy of this draft report to the Aboriginal stakeholders and considers all comments received. The proponent should continue to inform these groups about the management of Aboriginal cultural heritage sites within the study area throughout the life of the project.

> **Recommendation 9**: Continued consultation with the registered Aboriginal parties

#### *5.11.2.2 Continue to inform these groups about the management of Aboriginal cultural heritage sites within the study area throughout the life of the project. This recommendation is in keeping with the consultation requirements. Central Precinct*

Biosis (2017c) conducted a review of archaeological studies that have been undertaken throughout the vicinity of the Central Precinct since the completion of the initial Tallawarra lands Archaeological Assessment that informed the Concept Plan. Two further studies have been undertaken in the area since this time, with both relating to works along the Lake Illawarra Foreshore for a bike and pedestrian path. These studies identified to new PAD areas and one new artefact scatter at Tallawarra Point. A search of AHIMS database was undertaken, with four sites located within the Central precinct.

An archaeological survey was undertaken throughout the Precinct to attempt to re-identify the Aboriginal archaeological sites identified within the AHIMS search and to undertake a systematic survey of the study area targeting areas with the potential for Aboriginal Heritage. A total of 5 transects were walked on the 29th June 2017 that did not yield any new Aboriginal sites or artefacts. Section 4 of **Appendix N** contains further details of this survey. This survey led to the Biosis (2017c) assessment concluding that the majority of the Central Precinct has a medium Archaeological potential, with the southern slope of Mount Brown assessed as having a low potential and the drainage line that runs through the middle of the Central precinct having a High Archaeological potential.

Biosis (2017c) conducted a significance assessment against the four Aboriginal sites identified through the AHIMS search, with this assessment finding three sites of low scientific value and one of medium value, as discussed within **Table 5-32**. These four sites were predicted to be directly impacted by the proposed layout for the Central Precinct, with a total loss of value.

**Table 5-32 Statements of scientific significance for archaeological sites recorded within the study area.**

| Site Name | Statement of Significance |
|---|---|
| **Tallawarra Pipeline PAD 3**<br>**52-5-0523** | This PAD site was registered by the Wadi Wadi Coomaditchie following the completion of a field survey for a proposed pipeline easement. The PAD area is situated on a mid slope ridge on a moderate slope. It overlooks a small drainage feature to the south west and Duck Creek to the south. PAD sites represent a common example of a site within the Illawarra region. However; archaeological testing has not been conducted at this site, therefore the site content and representativeness of the site cannot be adequately assessed. The site has no direct historical or aesthetic associations. This site has been assessed as having unknown scientific significance. The site displays low levels of disturbance and represents a common example of a site within the area. The site also has no direct historical or aesthetic associations and has a low scientific potential. The scientific significance of this site has been assessed as moderate. |
| **TLPD AFT 7**<br>**52-5-0613** | Site was recorded as a stone artefact scatter following test excavations conducted at the site. The excavations identified one chert core and one silcrete flake. The site was located on a drainage feature in an upper slope landform. The site displays low levels of disturbance and represents a common example of a site within the area. The site has no direct historical or aesthetic associations. The scientific significance of this site has been assessed as moderate. |
| **TLPD AFT 8**<br>**52-5-0614** | Site was recorded as a stone artefact scatter located on a moderate slope north or Yallah Bay Road. Two artefacts were identified during test excavations of the site, consisting of one chert flake and one chert flake fragment. The site displays low levels of disturbance and represents a common example of a site within the area. The site has no direct historical or aesthetic associations. The scientific significance of this site has been assessed as moderate. |
| **TLPD AFT 9**<br>**52-5-0615** | The site was recorded as an isolated artefact and was located on a spurline in a hillcrest landform. The artefact was uncovered during test excavations of the site and one piece of debitage was identified. A fig tree associated with TLPD AFT 9 (52-5-0615) was identified as being culturally important in previous assessments (Biosis 2010b). The fig tree is of cultural value as they are the main trees used for either men's business or women's business, as meeting places, and are known to be used in the area as birthing trees. The site displays low levels of disturbance and represents a common example of a site within the area. The site has no direct historical or aesthetic associations. The scientific significance of this site has been assessed as moderate. |

#### 5.11.2.2.2 Central Precinct Recommendations

> **Recommendation 1**: Further archaeological assessment is required in areas of moderate and high archaeological potential

Areas identified as having high and moderate archaeological potential should be avoided wherever possible (Figure 10 of **Appendix M**). If impact to these areas cannot be avoided subsurface investigations (test excavations) will be required prior to the commencement of works as a condition of the DA or concept approval. Test excavations should be conducted in accordance with the *Code of Practice for archaeological investigation for Aboriginal objects in NSW* (DECCW 2010b) and *Aboriginal cultural heritage consultation requirements for proponents in New South Wales* (DECCW 2010c).

> **Recommendation 2**: Further archaeological assessment is required at Tallawarra Pipeline PAD 3 (AHIMS 52-5-0523)

If impacts to Tallawarra Pipeline PAD 3 (AHIMS 52-5-0523) cannot be avoided, subsurface investigations (test excavations) will be required prior to the commencement of works as a condition of the DA or concept approval. Test excavations should be conducted in accordance with the *Code of Practice for archaeological investigation for Aboriginal objects in NSW* (DECCW 2010b) and *Aboriginal cultural heritage consultation requirements for proponents 2010* (DECCW 2010a).

> **Recommendation 3**: Conservation of Fig Tree associated with TLPD AFT 9 (AHIMS 52-5-0615)

If possible the Fig Tree associated with TLPD AFT 9 (AHIMS 52-5-0615) should be conserved and incorporated into the modification of the concept approval.

> **Recommendation 4**: No further archaeological assessment is required in areas of low archaeological potential

No further archaeological work is required in areas identified as having low archaeological potential except in the event that unexpected Aboriginal sites, objects or human remains are unearthed during development (refer to Recommendations 8 and 9 below).

> **Recommendation 5**: Fencing of AHIMS sites

AHIMS sites or PAD areas located within 30 metres of the area of proposed works should be clearly marked and fenced in order to avoid unintentional impacts during construction.

> **Recommendation 6**: Aboriginal cultural heritage induction for workers and contractors

The locations of each AHIMS site and PAD area located within the Tallawarra Lands development should be clearly mapped. Workers and contactors working at, or visiting the site should be made aware of the location of all AHIMS sites and PAD areas within the Tallawarra Lands development through an Aboriginal cultural heritage induction.

> **Recommendation 7**: Application for an Aboriginal heritage impact permit (AHIP)

Should the Development Application be approved, it is recommended that an application be made to OEH for an AHIP to destroy the listed Aboriginal sites within the study area which are currently protected under the NSW *National Parks and Wildlife Act 1974*. **The AHIP should be for a term of ten (10) years.** The sites that will be impacted by the proposed works are as follows:

- Tallawarra Pipeline PAD 3 (AHIMS 52-5-0523)
- TLPD AFT 7 (AHIMS 52-5-0613)
- TLPD AFT 8 (AHIMS 52-5-0614)
- TLPD AFT 9 (AHIMS 52-5-0615)

> **Recommendation 8**: Discovery of Unanticipated Aboriginal Objects

All Aboriginal objects and places are protected under the *NSW National Parks and Wildlife Act 1974*. It is an offence to knowingly disturb an Aboriginal site without a consent permit issued by the OEH. Should any Aboriginal objects be encountered during works associated with this proposal, works must cease in the vicinity and the find should not be moved until assessed by a qualified archaeologist. If the find is

determined to be an Aboriginal object, the archaeologist will provide further recommendations. These may include notifying the OEH and Aboriginal stakeholders.

> **Recommendation 9**: Discovery of Aboriginal Ancestral Remains

Aboriginal ancestral remains may be found in a variety of landscapes in NSW, including middens and sandy or soft sedimentary soils. If any suspected human remains are discovered during any activity you must:

1. Immediately cease all work at that location and not further move or disturb the remains
2. Notify the NSW Police and OEH's Environmental Line on 131 555 as soon as practicable and provide details of the remains and their location
3. Not recommence work at that location unless authorised in writing by OEH.

> **Recommendation 10**: Continued consultation with the registered Aboriginal stakeholders

As per the *Aboriginal cultural heritage consultation requirements for proponents 2010* (DECCW 2010a), it is recommended that the proponent provides a copy of this draft report to the Aboriginal stakeholders and considers all comments received. The proponent should continue to inform these groups about the management of Aboriginal cultural heritage sites within the study area throughout the life of the project.

### 5.11.3 Mitigation Measures

#### *5.11.3.1 Conditions of Approval*

The Concept Plan Approval included a number of additional requirements for all future approvals with regards to Aboriginal heritage as detailed in **Table 5-33**. These requirements are considered sufficient for assessment of the Proposed Modification.

**Table 5-33 Tallawarra Lands Concept Plan Conditions of Approval – Aboriginal Heritage**

| Tallawarra Lands Concept Plan Conditions of Approval | | |
|---|---|---|
| ***Schedule 3 – Future Environmental Assessment Requirements*** | | ***Response*** |
| Future Environmental Assessment Requirements | **8 Cultural Heritage Management Plan**<br>The first future application to Council (refer to condition A6) for shall be accompanied by a Cultural Heritage Management Plan that details how impacts on Aboriginal and non-Aboriginal heritage across the entire site will be minimised and managed. The plan shall include, but not necessarily be limited to:<br>f) Specific measures to be applied to works undertaken in close proximity to identified Aboriginal and non-Aboriginal heritage items to minimise and avoid impacts on these items;<br>g) How heritage items (Aboriginal objects and relics or works) discovered during the construction of the project will be considered and managed. This shall include a component within the site induction program for construction workers on Aboriginal and non-Aboriginal heritage within the project area;<br>h) Stop-work and notification procedures to be implemented should any unexpected impact archaeological deposits and/or State significant relics not previously identified be discovered;<br>i) A procedure for continued consultation with the relevant Aboriginal stakeholders; and<br>j) Procedures to be followed should non-compliance against any of the provisions of the management plan occur.<br>All future application must demonstrate how they will implement the Cultural Heritage Management Plan. | A Cultural Heritage Management Plan would be prepared to accompany the first future application. This would remain unchanged by this proposed modification. |

#### *5.11.3.2 Statement of Commitments*

Mitigation measures identified by the SoCs that are applicable to Aboriginal Heritage, and which would apply to the Modification Proposal, are listed in **Table 5-34** below.

**Table 5-34 Tallawarra Lands Concept Plan Statement of Commitments – Aboriginal Heritage**

| Tallawarra Lands Concept Plan Statement of Commitments | | Response |
|---|---|---|
| Aboriginal Heritage | 16. TRUenergy commits to implementing the recommendations of the Aboriginal Archaeological Assessment. | BridgeHill commits to implementing the recommendations contained within the initial investigation undertaken for the Concept Approval in addition to the recommendations contained within **Appendix M** and **Appendix N** |
| Heritage | 17a. TRUenergy commits to preparing a Heritage Management Plan detailing how construction impacts on Aboriginal and non-Aboriginal heritage will be minimised and managed. The Plan shall include, but not necessarily be limited to:<br>v. Specific measures to be applied to works undertaken in close proximity to identified Aboriginal and non-Aboriginal heritage items and "Defined Areas of Aboriginal Sensitivity" to minimise and avoid impacts on these items;<br>vi. How heritage items (Aboriginal objects and relics or works) discovered during the construction will be considered and managed. This shall include a component within the site induction program for construction workers on Aboriginal and non-Aboriginal heritage within the site area;<br>vii. Stop-work and notification procedures to be implemented compliant with Heritage Office and OEH guidelines should any unexpected intact archaeological deposits and/or State significant relics not previously identified be discovered; and<br>viii. The procedure for continued consultation with the relevant Aboriginal stakeholders. | BridgeHill commits to implement the requirements stipulated within the TRU energy statement of commitments 17a. |

Aboriginal heritage issues associated with the development of the Tallawarra Lands would be managed in accordance with the Concept Plan Approval and associated SoCs referred to above. There are considered adequate to address the potential impacts of the Modification Proposal.

## 5.12 Utility Servicing

The SEARs identified a requirement to investigate the existing capacity of the site and any additional requirements required by the proposed medication. Additionally, an investigation of sustainability initiatives into reducing drinking water demand is to be undertaken. The SEARs addressed in this section are identified in **Table 5-35**.

**Table 5-35 Secretary's Environmental Assessment Requirements (Utilities)**

| Secretary's Environmental Assessment Requirements | Where Addressed |
|---|---|
| ***17. Utilities*** | |
| The modification request shall:<br>• Address, in consultation with relevant agencies, the existing capacity and requirements of the proposal for the provision of utilities, including staging of infrastructure works and protection of utilities' assets; and | **Section 5.12.2** |
| • Outline any proposed sustainability initiatives to reduce the demand for drinking water, including alternative water supply, end users of drinking and non-drinking water, water sensitive urban design and proposed water conservation measures.. | **Section 5.3 and Appendix E** |

### 5.12.1 Tallawarra Lands Concept Approval

To aid in the design of the Tallawarra Lands Concept Plan, Northrop (2010) prepared a 'Report on Siteworks and Utilities Infrastructure'. This report investigated the existing service provision across the site, identifying what service infrastructure would need to be provided. This report was summarised in the Environmental Assessment prepared by DFP (2011). The Northrop investigation identified the following;

#### *5.12.1.1 Sewerage*

No sewer connections points are readily available for servicing the ultimate development of the Tallawarra Lands. There is the potential for some of the development within the Central Precinct to be serviced with access to sewer within the Princes Highway.

Preliminary advice from Sydney Water indicated that sewer servicing could occur by connection to existing Sydney Water infrastructure to the north of the development. This would require at least one Sydney Water Sewerage Pump Station to be established on-site. Sydney Water were investigating options for this, with a determination indicated to be made available in November 2011.

#### *5.12.1.2 Water*

Preliminary investigations and discussions with Sydney Water confirmed that water servicing of the Tallawarra Lands could occur by extension of the Dapto Reservoir Supply system at the north of the site. This would require;

> The establishment of the main water supply connection point and extension to occur as part of the initial development phases. This will provide the main source of potable, fire and back-up water supply.

> The implementation of rainwater harvesting and re-use opportunities to encourage mains water conservation (at least) through localised non-potable uses. This is expected to be promoted throughout the development stages.

#### *5.12.1.3 Natural Gas*

Whilst extensive natural gas services exist on site associated with the Tallawarra CCGT power station, the Tallawarra Lands will require new local network services. Alinta advised that current network planning allows for servicing of the Tallawarra Lands. This provision of services generally occurs as development demands, with the overall strategy for the site being determined by on-going demands and staging of the development.

#### *5.12.1.4 Electricity*

Integral Energy indicated that the site is not readily serviced by the existing major on-site infrastructure. Local networks in the area do not have the capacity to service much (if any) of the Tallawarra Lands. Preliminary advice indicated that electricity supply to the ultimate development of Tallawarra will require the establishment of a 132kV / 11kV Zone Substation, with this required within 3 to 4 years of the commencement of development works.

#### *5.12.1.5 Telecommunications*

Consultation with Telstra indicated that optical fibre would be available in July 2011. Implementation of the telecommunications network will then take place as development demands, and staging will therefore be progressive.

### 5.12.2 Concept Plan Modification Impact Assessment

In order to assess the potential impact of the increased densities and proposed adjustments to the precinct boundaries, Cardno undertook preliminary discussions with the various service providers to determine the degree of impact to developed servicing strategies. The advice contained below summarises these findings. It should be noted that the Northrop (2010) investigation remains the technical document for the Tallawarra Lands Concept Approval, with follow up investigations forming supplementary information to the completed investigation.

#### *5.12.2.1 Northern Precinct*

##### 5.12.2.1.1 Sewerage

A feasibility application has been submitted to Sydney Water and the assessment found that the current wastewater system could accommodate up to 300 dwellings, which is less than the approved concept number of dwellings for the area (approximately 360 dwellings). Given the increase in density and lot yield proposed in this modification Sydney Water notes that the findings of their current report need to be revisited to define an appropriately sized scheme to ensure the development is adequately serviced. Based on a preliminary concept design undertaken by Cardno's Sydney Water Accredited Water Servicing Coordinator (WSC), the system could be serviced by either an upsizing of the previously proposed main or by constructing a duplicate main. This would need to be confirmed during the concept and detailed design stages of the development as part of the Section 73 application process.

Based on preliminary advice received and noted above, it is expected that the additional densities and lot yield increases can be accommodated however this will require further network analysis by Sydney Water, design iterations by an accredited WSC and possible changes to the proposed system upgrades suggested in Sydney Water's planning report for the area. It should be noted that the concept design approved number of dwellings was greater than what the system could have potentially handled so additional modelling and design work would have been required irrespective of this modification.

##### 5.12.2.1.2 Water

A feasibility application has been submitted to Sydney Water and the assessment found that drinking water could be supplied to the proposed development from the existing drinking water system in Gilba Street (from Goondah Avenue). It was noted in the advice letter from Sydney Water that this section of watermain may need be to upsized from 100mm to 150mm to ensure sufficient supply to the increased development area. This will be reviewed and addressed as part of future Section 73 applications once development consent is obtained from the consent authority.

Based on the preliminary advice received and noted above, it is expected that there will be no water supply issues that would prevent the density increase proposed, nor the increase in proposed developable land for the northern precinct.

##### 5.12.2.1.3 Natural Gas

A preliminary design was completed by Jemena back in 2011. Jemena are still to confirm the increased density and lot yield can be accommodated. Previous experience within the Illawarra indicates that the size of the mains proposed in the preliminary design are not expected to be an issue.

##### 5.12.2.1.4 Electricity

Preliminary investigations undertaken by previous consultants indicated that the existing local electricity supply network in Gilba Road had capacity to supply approximately 240 residential lots in the North Shore Precinct. To service further lots, augmentation to the existing network would be required via construction of a new 11kV feeder between Kanahooka Road and Edgeworth Avenue. Further work was proposed to reconfigure the 11kV network to make the supply available to supply further lots.

Given the number of lots in the approved concept design required further upgrades to the existing system, it is expected that the proposed upgrades would enable the increased densities and lot yield to be satisfactorily serviced without impacting on existing Endeavour Energy (EE) customers. Cardno's experience on similar projects indicates that EE would be able to make minor adjustments to the existing network prior to making significant infrastructure investments (i.e. zone substations) and be able to service the proposed increase in densities/lot yield in the northern precinct.

##### 5.12.2.1.5 Telecommunications

Previous investigations by other consultants confirmed that Telstra could supply the development on an as needs basis. Tallawarra Lands have been registered with NBN Co.

Given the increase in densities/yield is fairly minor in the overall telecommunications network for the area, it is expected that any changes in infrastructure required would be minor, if any. This would be confirmed by either Telstra or NBN Co at the time of further design development.

#### *5.12.2.2 Central Precinct*

##### 5.12.2.2.1 Sewerage

A feasibility application has been submitted for the overall development (in addition to the separate one submitted for the North Shore Precinct) rather than a distinct one for the Central Precinct. A previous feasibility application submitted by another consultant, which outlined a number of options to service the central precinct with a wastewater strategy, was submitted to Sydney Water. At the time of preparation of the current feasibility application it was noted by the consultant that Sydney Water's Growth Servicing Plan (GSP) highlighted the development to occur in the Tallawarra Lands area. Further reports have since been prepared by Sydney Water and their design consultants that outlines a strategy for the delivery by Sydney Water of a wastewater pump station (WWPS) and section of rising (pressure) main to service the central (and southern) precincts.

Based on the level of infrastructure to be delivered by Sydney Water it is expected that the currently proposed WWPS and rising main would have sufficient capacity to service the proposed increase in densities/lot yield within the central precinct. This would need to be confirmed by Sydney Water during design for the appropriate stage.

##### 5.12.2.2.2 Water

A feasibility application has been submitted for the overall development (in addition to the separate one submitted for the North Shore Precinct) rather than a distinct one for the Central Precinct. A previous feasibility application submitted by another consultant outlined the connection to an existing 300mm drinking watermain on the corner of Yallah Bay Road and Princes Highway. This strategy would need to be confirmed by Sydney Water during the detailed design and Section 73 application for the Central Precinct.

Given the size (and subsequent capacity of this main) it is expected that the increase in densities/lot yield would be able to be serviced by the 300mm watermain without any further augmentation to the system. This would need to be confirmed by Sydney Water during design for the appropriate stage however based previous experience water supply will not be a constraint to increasing the developable area nor increased density.

##### 5.12.2.2.3 Natural Gas

A preliminary design was completed by Jemena back in 2011. Jemena are yet to confirm the increased density and lot yield can be accommodated. Previous experience within the Illawarra indicates that the size of the mains proposed in the preliminary design are not expected to be an issue.

##### 5.12.2.2.4 Electricity

Preliminary investigations undertaken by previous consultants indicated that the existing local electricity supply network had the capacity to service approximately 150 dwellings in the central precinct. The 11kV supply point of connection would need to be confirmed by EE once an application was made to connect as part of the detailed design phase. Further upgrades and the construction of a new zone substation (funded by EE) would need to be constructed, not only as part of the Tallawarra Lands project, but other major urban land releases in the vicinity. The timing of the delivery of the proposed zone substation would be dependent on the number of applications for connection received by EE.

Similar to the North Shore Precinct the existing electricity supply network did not have sufficient capacity (without further augmentations) to supply the concept approved number of lots within the central precinct (approximately 300 lots). Based on this, and the required augmentations to achieve the concept approved number of lots, previous experience suggests that by constructing a new zone substation in the vicinity of the site EE would have sufficient additional capacity to service the increased densities/lot yield in the Central Precinct.

#### 5.12.2.2.5 Telecommunications

Previous investigations by other consultants confirmed that Telstra could supply the development on an as needs basis. Tallawarra Lands have been registered with NBN Co.

Given the increase in densities/yield is fairly minor in the overall telecommunications network for the area, it is expected that any changes in infrastructure required would be minor, if any. This would be confirmed by either Telstra or NBN Co at the time of further design development.

### 5.12.3 Mitigation Measures

#### *5.12.3.1 Conditions of Approval*

The Concept Plan Approval included a number of additional requirements for all future approvals with regards to Utilities as detailed in **Table 5-36**. These requirements are considered sufficient for assessment of the Proposed Modification.

**Table 5-36 Tallawarra Lands Concept Plan Conditions of Approval – Utilities**

| Tallawarra Lands Concept Plan Conditions of Approval | | |
|---|---|---|
| ***Schedule 3 – Future Environmental Assessment Requirements*** | | ***Response*** |
| Sydney Water Requirements | **22 Options Report and the endorsement of a Preferred Servicing Strategy**<br>The first development application to Council (refer to Condition A6) submitted to Wollongong City Council must be accompanied by a Preferred Servicing Strategy endorsed by Sydney Water. | .A plan will be prepared by Sydney Water to accompany the first development application. |

#### *5.12.3.2 Statement of Commitments*

Mitigation measures identified by the SoCs that are applicable to Utilities, and which would apply to the Modification Proposal, are listed in **Table 5-37** below.

**Table 5-37 Tallawarra Lands Concept Plan Statement of Commitments – Aboriginal Heritage**

| Tallawarra Lands Concept Plan Statement of Commitments | | Response |
|---|---|---|
| Utilities Infrastructure | 15. TRUenergy commits to implementing the utilities servicing strategies identified in the Report on Siteworks and Utilities Infrastructure, prepared by Northrop. | BridgeHill also commits to implementing the utilities and servicng strategies identified in the Northrop Report. |

Utilities issues associated with the development of the Tallawarra Lands would be managed in accordance with the Concept Plan Approval and associated SoCs referred to above. There are considered adequate to address the potential impacts of the Modification Proposal.

# 6 Conclusion & Recommendations

This section provides a conclusion to the report

## 6.1 Conclusions

The Tallawarra Lands Concept Plan Approval (Concept Plan) (MP09_0131) was approved on 23 May 2013 for a mixed use development including residential, commercial, industrial, retail and public open space, along with conservation areas. The approval provides the overarching requirements for the future residential development of the land. Since this approval was granted the need for housing within the Illawarra has increased and the type of housing stock required has shifted as the demographics of the area changed. Additionally, the southern Lakeside Precinct is being held by Energy Australia and not therefore developable, reducing the overall yield of residential and employment lands.

The proposed modification seeks to increase the density of development within the northern half of the site that is proposed to be developed by amending zone boundaries and minimum lot sizes to meet this increase in demand and the changing demographic requirements. The modification also seeks to amend a number of conditions of the original Concept Plan approval to acknowledge changes that have occurred over the four years since the approval was granted. These changes primarily comprise the separation of the North Shore and Central precincts from the Southern Precinct and the associated requirements of the first development application.

The Tallawarra Lands is a Transitional Part 3A project, and the modification provisions under section 75W (now repealed) of the EP&A Act continue to apply. A review of the legal precedent for section 75W modifications has been undertaken, which illustrates that the scale of modification is within the bounds of section 75W.

Comprehensive assessment of the potential environmental impacts associated with the project has been undertaken. The assessments have reviewed the existing studies that informed the Concept Approval in consideration of the existing land use and legislative context. The studies have then considered the potential for additional impacts resulting from the modification and, where required, how these impacts can be offset. A summary of the findings of the key studies is below.

The acoustic assessment considered the industrial, transport and urban noise affectation. The assessment found that the noise impacts resulting from the development will not be any greater than noise impacts on the previously approved lots. Therefore, no land use planning issues from cumulative industrial operations are expected for the North Shore or Central precincts.

The traffic impact assessment prepared for the modification found that the revised development yield did not result in any critical network operational concerns or significant differences when compared with the approved yield. The report identified a number of intersections that had performance issues in the future, however it was noted these could be addressed by standard intersection upgrades, either by traffic signals or roundabout control.

The ecological assessment considered direct and indirect impacts resulting from the proposed modification. Direct impacts to the ecological values are limited, as the majority of the development is associated with cleared land, with only a further 4.2% of the development site being cleared as a result.

Indirect impacts from the proposed development may include noise and/or erosion associated with the construction phase of the project. These impacts will be managed through the development of a CEMP and a landscape scheme using native species to help reintroduce vegetation in areas of the site currently comprising cleared grass, improving biodiversity and visual amenity, with associated environmental sustainability benefits.

The proposed modification has been assessed against the provisions within *Planning for Bush fire Protection 2006* (PBP) to ensure compliance can be achieved. These provisions require Asset Protection Zones and Access to be provided. These measures have been incorporated into the proposed modification layout to ensure compliance with PBP.

The potential for stability issues has been considered through desk top and intrusive investigations. The assessment found that the expanded Central Precinct poses moderate geotechnical risks, with the North Shore Precinct having low risk. The potential risks can be managed by appropriate engineering design, which would be determined through future intrusive investigation and assessment prior to works commencing.

The contamination investigation comprised desk top and intrusive investigations. The assessment identified that there are currently no Contaminants of Potential Concern (COPC) present in the Central and North Shore Precinct modification areas at concentrations above the Tier I human health screening values.

Copper is present at the site at concentrations above the Tier I ecological screening values. However, ecological receptors of significance were not identified at or within close proximity to the modification areas. The overall potential risk to the local environment based on the measured copper concentrations is considered low. A site auditor accredited under the Contaminated Land Management Act 1997, has been engaged by Bridgehill to provide audit services during the assessment and remediation of the site. The auditing provides an additional level of diligence to ensure a comprehensive assessment is undertaken.

A visual assessment has been undertaken using the methodology employed for the Concept Approval. The assessment found that while the development would result in additional urban development being visible from viewing points beyond the site, the potential impact is limited and partially offset through the relocation of powerlines underground and removal of associated stanchion's.

The proposed changes are assessed and clearly illustrated through a photographic survey and the production of artist impressions to determine the overall impact of the changes. The modifications are characterised by the backdrop of the Escarpment, which forms the dominant feature and minimises sky lining, which in conjunction with controls to cap building height and to carry out ridgeline tree planting will limit visual impact.

The environmental assessments illustrate that the proposed modification subject to the identified mitigation and management measures will not create a significant environmental impact beyond that approved by the Concept Plan. The modification would contribute to meeting the residential and employment needs of the Illawarra consistent with State and local strategic planning documentation. Consequently, the modification provides a contemporary approach to realising the potential of the site, while addressing the potential for impact and is considered worthy of support.

# 7 References

This section identifies reference material used in this report

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Tallawarra Lands Concept Plan
Approval Modification

# APPENDIX A

## SEARS

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# APPENDIX B

## SEARS COMPLIANCE TABLE

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# APPENDIX C

# STAKEHOLDER ENGAGEMENT PLAN

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# APPENDIX D

## TRAFFIC

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# APPENDIX E

## FLOOD RISK ASSESSMENT

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# APPENDIX F

## NOISE ASSESSMENT

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# APPENDIX G

# BIODIVERSITY ASSESSMENT REPORT

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# APPENDIX H

## BUSH FIRE ASSESSMENT

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# APPENDIX

# I

## GEOTECHNICAL REPORT

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# APPENDIX J

## ENVIRONMENTAL SITE ASSESSMENT

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# APPENDIX K

## VISUAL IMPACT ASSESSMENT

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# APPENDIX L

## STATEMENT OF HERITAGE IMPACT

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# APPENDIX M

## ARCHAEOLOGICAL REPORT: NORTH PRECINCT

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# APPENDIX N

## ARCHAEOLOGICAL REPORT: CENTRAL PRECINCT

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# APPENDIX O

## INTERIM SITE AUDIT ADVICE

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# APPENDIX P

## LANDSCAPE PLAN

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# APPENDIX Q

## LANDSCAPE VISUAL ASSESSMENT

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