MOTT MACDONALD

80 Betty Cuthbert Drive, Lidcombe Master Plan

Preliminary Environmental Assessment Report

Planning Proposal

04 August 2021

Confidential

Issue and revision record

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Contents

1 Introduction

Mott MacDonald has been engaged by Department of Planning, Industry and Environment (DPIE), to conduct a Preliminary Environmental Assessment to guide the planning proposal for rezoning of 80 Betty Cuthbert Drive, Lidcombe (the Project). The purpose of this Preliminary Environmental Assessment report is to assist in the identification of key environmental considerations to inform the development of the project.

1.1 Regional context

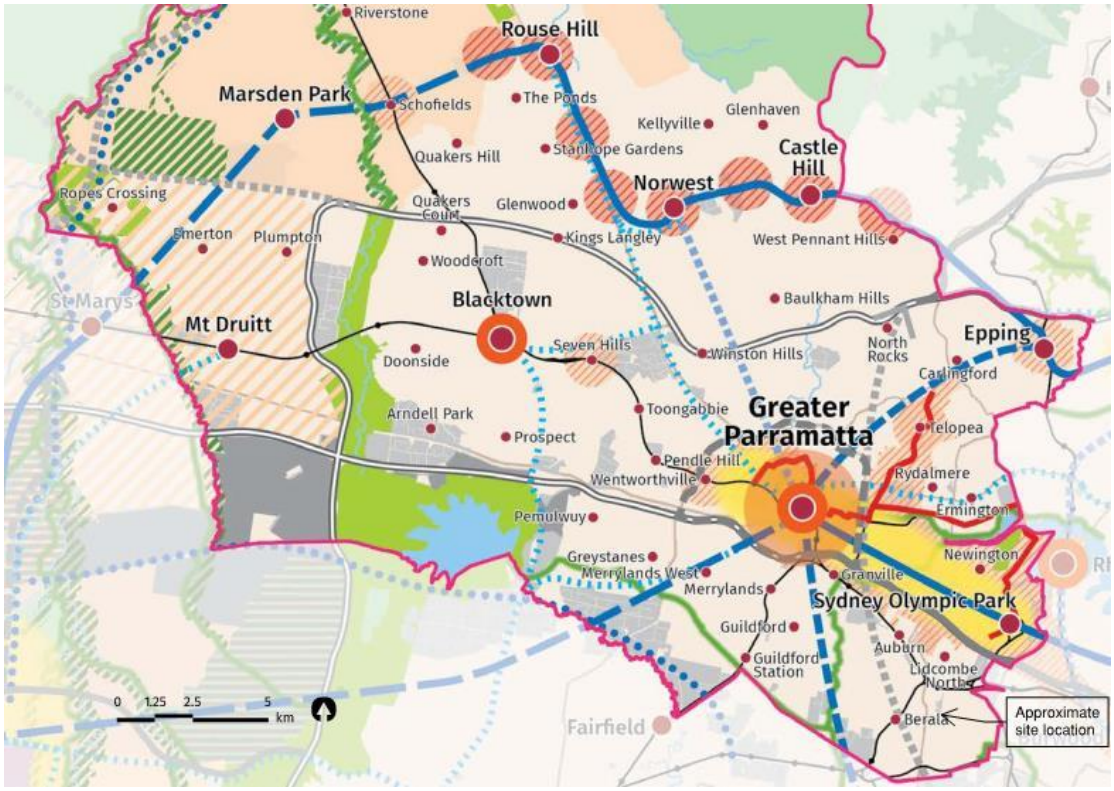
The site is located within the suburb of Lidcombe, approximately 15km west of Sydney CBD and within the Cumberland local government area. The closest major interchange station is Lidcombe Station, 1.5km north of the site, and Berala Station is the nearest station, 1.2km west of the site. The site is surrounded by a mixture of land uses and facilities, with residential land to the north, east and south, an educational site to the south east and the Carnarvon Golf Course to the west.

In March 2018 the NSW Government released the Greater Sydney Region Plan which outlined a vision of three cities; a western parkland city, a central river city and an eastern harbour city. The study area lies within the Central City District as shown in Figure 1 below. It is within close proximity to Lidcombe North and Berala local centres, which have been identified for urban renewal.

1.2 Study area

The project site is located at 80 Betty Cuthbert Drive, Lidcombe (Figure 2). It has a primary frontage to Joseph Street between Georges Avenue to the north and Botanica Drive to the south. The site is approximately 5.8ha in area. It is currently occupied by Multiple Sclerosis Limited (MSL); existing development of the site includes a 1970's circa 4,300sqm brick building that provides office space, treatment facilities and respite care facilities to support the operations of MSL. The existing MSL facilities are positioned at the high point of the site and cover approximately 12% of the site area. The remainder of the site is unused, consisting of amenity grassland with scattered trees. Existing vehicle access to the site is via the intersection of Joseph St and Botanica Drive. The existing access route then enters the site on the southern side via Betty Cuthbert Drive with an existing internal road continuing to the centre of the site where the MSL facility currently lies.

Figure 1: Central city plan



Source: Central City District Plan (Greater Sydney Commission, 2018)

Figure 2: Site overview

Source: Google Earth (2018)

1.3 Proposed development

In 2017, DPIE prepared a master plan for the site which allocated land for a future educational establishment, health facility and for residential use. The masterplan has been developed with key stakeholders, Department of Education (DE) and Multiple Sclerosis Limited (MSL). The future educational establishment will be developed by the DE and the health facility by MSL.

The future educational establishment will be located on a 1.85 ha parcel in the central western portion of the site. The education establishment, for the purpose of this assessment, has been assumed as a 1,000 student primary school, to accommodate a maximum capacity scenario for development of that land. It should be noted that this is an assumption made for this assessment and the establishment may be a different type of school.

A 0.95 ha site adjacent Joseph Street will be used for a new health facility, and the surplus land (approx. 1.78 ha) will be rezoned to medium density residential land (excluding road and drainage areas) and divested. The concept plan of the development is shown in Figure 3 below.

Figure 3: Concept Indicative Layout Plan

Source: Urbis - 80 Betty Cuthbert Drive, Lidcombe – Indicative Layout Plan (02 August 2021)

1.4 Purpose of report

The purpose of this Preliminary Environmental Assessment report is to assist in the identification of key environmental considerations to inform the planning proposal for 80 Betty Cuthbert Drive. Project considerations have been identified for both the construction and operation phase of the

project, where relevant. Recommendations are provided to address the identified project considerations and to fill any data gaps that are apparent. The areas considered in this assessment include:

- noise and vibration;
- fauna and flora biodiversity;
- landscape and visual;
- heritage;
- air quality; and
- surface and groundwater.

1.5 Investigation methodology

This Preliminary Environmental Assessment has relied on publicly available data and a site walkover carried out on 7 March 2019. The following publicly-available data sources have been reviewed:

- NSW Office of Environment and Heritage BioNet database
- NSW Office of Environment and Heritage state heritage register
- NSW Office of Environment and Heritage register of Aboriginal places
- Cumberland Local Environment Plan
- NSW Office of Environment and Heritage air quality database
- NSW Office of Environment and Heritage eSPADE
- Department of Primary Industries (Water) water monitoring database
- Water NSW water quality database

2 Planning and legal considerations

The development of the project must comply with the following planning laws and legislation:

- Environmental Planning and Assessment Act 1979
- Environmental Planning and Assessment Regulations 2000
- Cumberland Local Environment Plan
  - Auburn Local Environmental Plan (2010)
  - Parramatta Local Environmental Plan (2011)
  - Holroyd Local Environmental Plan (2013)
- Relevant State Environmental Planning Policies
- Biodiversity Conservation Act 2016
- Protection of the Environment and Operations Act 1997
- Water Management Act 2000
- Environment Protection and Biodiversity Conservation Act 1999
- Roads Act 1993
- Waste Avoidance and Resource Recovery Act 2001

3 Environmental assessment

A review of the baseline environment and how the project will interact with the environment during both construction and operation has identified the following key environmental considerations for the project:

- Noise and vibration
- Biodiversity (fauna and flora)
- Landscape and visual
- Heritage
- Air quality
- Surface and groundwater

The following subjects will be considered in stand-alone reports and therefore will not be considered in this report:

- Traffic and transport (report reference: MMD-405675-PP-RP-01)
- Utilities and infrastructure (report reference: MMD-405675-PP-RP-02)
- Flooding and water quality management (report reference: MMD-405675-PP-RP-03)
- Contamination (report reference: MMD-405675-PP-RP-04).

3.1 Noise and vibration

3.1.1 Existing environment

The project site is relatively undeveloped, dominated by trees and open grassland. It is surrounded by medium density residential properties on three sides (Figure 4) resulting in a quiet ambient noise environment over most of the site; noise sources noted during the Mott MacDonald visit on 7 March 2019 were limited to infrequent visitors to the existing MSL building, birds, and dogs barking from the adjacent properties.

Joseph Street, a 6-lane road runs along the western boundary of the project site leading to road-generated noises dominating the ambient noise environment and elevated noise levels in the western areas of the site. To the west of the road lies Coleman Park and Carnarvon golf course.

3.1.2 Considerations

The close proximity of sensitive receptors (residential properties) to the site suggests noise and vibration could be a significant issue during construction; the construction phase would utilise heavy vehicles and equipment, which would generate considerable impactful noise and vibration levels.

Once developed, the proposed project could significantly influence the local noise environment and result in an increase in vehicle movements and human-generated noises, as well as building-noise emissions.

3.1.3 Recommendations

The design and layout of the project should consider the adjacent sensitive receivers (residential properties) with the objective to avoid increasing the ambient noise levels they experience when the site has been developed.

High existing noise levels along the western side of the project should be considered in the layout of the project; noise-sensitive land uses should be positioned away from the road. Similarly, the

design and layout of buildings should be considered to minimise the noise levels experienced. Noise abatement strategies (e.g. noise walls/earth banking) should be considered to mitigate the impact of the road on the adjacent land uses.

Construction-generated noise and vibrations should be managed as part of a construction environmental management plan through the implementation of mitigation strategies to reduce the impact on surrounding sensitive receivers. Strategies should be informed by a noise impact modelling study.

Figure 4: Sensitive receivers within 100 metres of project site

3.2 Biodiversity

3.2.1 Existing environment

Figure 5 is an aerial photo showing the distribution of habitats around the site. The project site is dominated by amenity planted grassland with scattered planted trees throughout (Figure 6), including native *Eucalyptus microcorys* (tallowwood), *Eucalyptus resinifera* (red mahogany),

Eucalyptus fibrosa (red ironbark) and *Corymbia maculate* (spotted gum), and non-native *Fraxinus excelsior* (ash). The trees are generally concentrated around the site boundary and the existing building, leaving open areas of grassland in between. An on-site stormwater detention (OSD) basin (Figure 7) is located in the lowest point of the site which was found to be congested with aquatic vegetation.

Figure 5: Distribution of habitat types

Figure 6: Amenity grassland with scattered trees

Figure 7: The detention basin

The NSW Office of Environment and Heritage BioNet database was searched for species protected from harm under the *Biodiversity Conservation Act 2016 and Environment Protection and Biodiversity Conservation Act 1999* on 12 March 2019. The database held records of 42 threatened species and 208 non-threatened species within 5km of the site from the last 5 years. None of the records were a result of a species-sighting within the site. Both lists of species are provided in Appendix A.

Given the habitats present at the site, the following threatened species could utilise the site, although none were seen during the site visit.

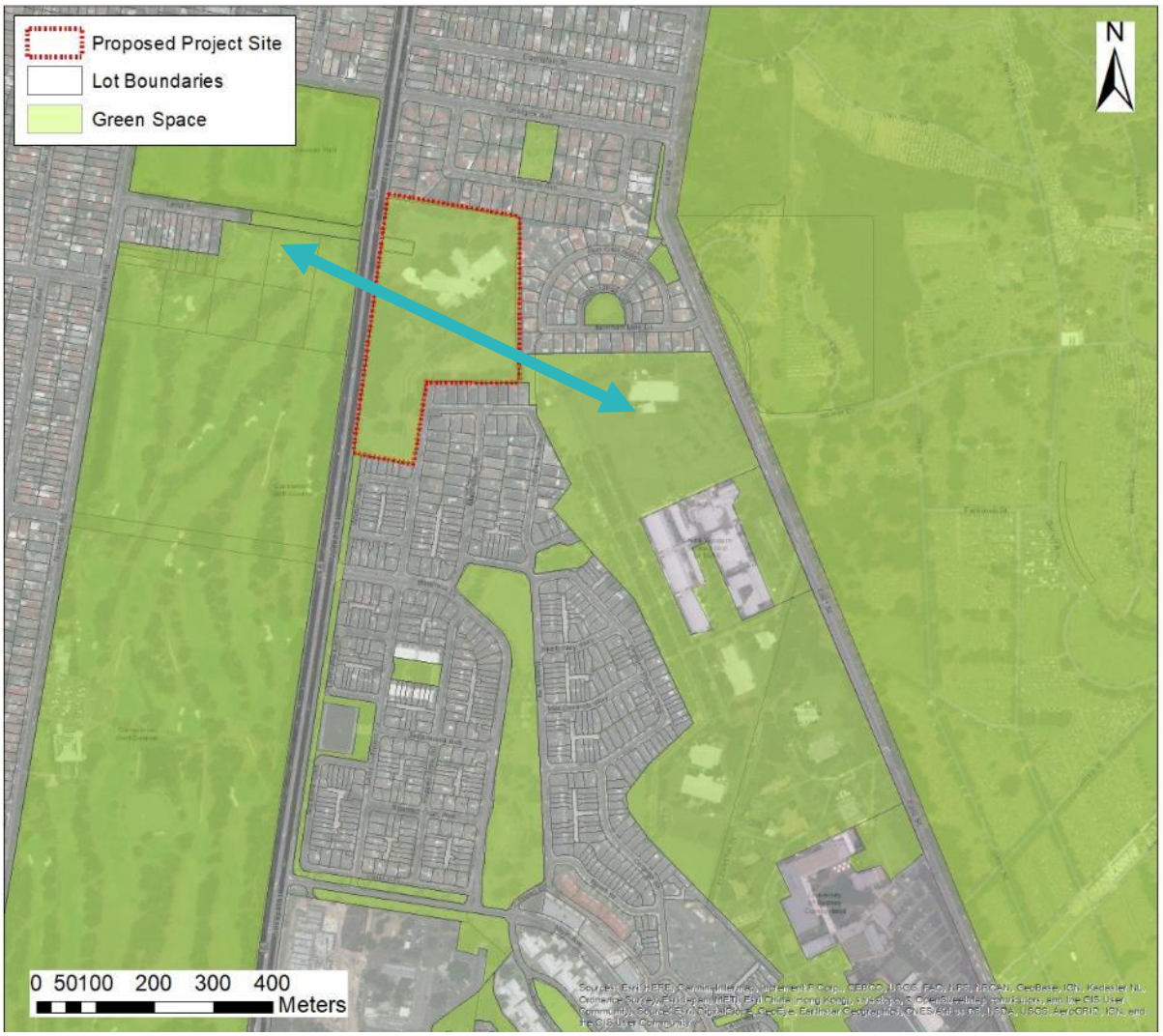
- Green and golden bell frog (*Litoria aurea*)
- Swift parrot (*Lathamus discolour*)
- Powerful owl (*Ninox strenua*)
- Grey-headed flying fox (*Pteropus poliocephalus*)
- Yellow-bellied sheathtail bat (*Saccolaimus flaviventris*)
- Eastern freetail bat (*Mormopterus norfolkensis*)
- Eastern bentwing bat ((*Miniopterus schreiberseii oceanensis*)
- Southern myotis bat (*Myotis macropus*)
- Tadgell's bluebell (*Wahlenbergia multicaulis*)
- Downy wattle (*Acacia pubescens*)

The detention basin has potential to be used for breeding for amphibians, including the threatened green and golden bell frog; 983 sightings of the species have been recorded in the BioNet database in the last five years within 5km of the project site.

Many of the trees within the site offer nesting/roosting opportunities for birds and bats, potentially including the listed threatened species. A noisey miner (*Manorina* melanocephala), protected in NSW, nest was recorded near to the existing building during the site visit. A pair of crested pigeons (*Ocyphaps lophotes*), protected in NSW, were also noted within the site. The habitats within the site will offer feeding opportunities for both birds and bats, whilst also providing a green linkage between the greenspaces of the park and golf course to the west of the project site and the Rookwood cemetery (Figure 8).

Rookwood cemetery includes two endangered ecological vegetation communities within a kilometre of the project site, identified by the NSW Office of Environment and Heritage, as shown in Figure 9. The communities include Cooks River / Castlereagh Ironbark Forest (critically endangered) and Shale Plains Woodland (critically endangered). These communities are significant habitats for a range of threatened fauna species, including, but not limited to, the grey-headed flying fox, yellow-bellied sheathtail bat, and swift parrot.

Figure 8: Biodiversity greenspace linkage



Arrow shows linkage pathway through the site connecting the greenspaces either side.

Figure 9: Endangered vegetation map within 1km of the project site

Source: NSW Office of Environment and Heritage

3.2.2 Considerations

The development of the site will require the removal of trees and lead to a reduction in total green space area in a relatively urban environment. Green space is critical to support biodiversity in an urban environment and maintain healthy populations of native species, particularly those already considered threatened.

The vegetated corridor formed by the site, linking the large areas of green space either side, could be broken by the development of the site, preventing the movement of species between the two areas. This could have negative implications on the resilience of species in the wider area and potentially lead to a reduction in biodiversity and species-abundance.

Disturbance of the site's habitats during construction could directly or indirectly impact the individuals that use the site. Potential impacts range from noise disturbance causing the displacement of individuals to death of individuals from construction activities. The site is not

considered to be of high conservation value due to the type and extent of the habitats present and its resulting low carrying capacity for species, however the potential for impact on protected species should be considered during construction.

3.2.3 Recommendations

The development of the site should look to enhance the biodiversity value of the area. To achieve this the following recommendations should be considered:

- Minimise the number of native trees removed and avoid removal of mature individuals that offer niches (e.g. cracks, crevices and lifted bark) for threatened species
- Target a net gain in the number of trees following development
- Landscape planting should focus on native species and provide complex habitat where possible, including ground-cover vegetation, mid-height bushes and trees
- Enhancement of the detention pond and other proposed water bodies for amphibians, including: pond profiling, in-water and surrounding vegetation, and connectivity with nearby habitats to offer suitable habitat for all life-stages
- Connectivity through the site should be maintained through landscape design; unbroken planting at ground and flight level that link the green spaces to the east and west of the site
- Lighting design should avoid the over-illumination of vegetated areas
- Survey of trees and the detention pond for their potential for protected species; as a minimum the study should include those that will be impacted by the development (*completed by Eco Logical dated 28/06/2019*)
- Detailed survey of the site for downy wattle (*completed by Eco Logical dated 17/06/2019*)
- Construction environmental management plan including strategies to avoid harm to protected species

It should be noted that a Preliminary Tree Assessment (ref: *19SUT-13268v1 by Eco Logical, 2019*) and Habitat Tree Assessment & Targeted Flora Survey (ref: *19SYD–13268 by Eco Logical, 2019*) have been completed for the site and are provided as part of the overall planning proposal submission.

3.3 Landscape and visual amenity

3.3.1 Existing environment

The land surrounding the project site is generally a combination of Low Density Residential (Land use code R2), Medium Density Residential (Land use code R3), Public Recreation (Land use code RE1) and Special Activities (Land use code SP1). Figure 10 provides a map showing the adjacent land uses to the project site.

The project site is located within an urban landscape setting, which is offset to a limited extent by the green spaces to the west and east. The dominance of low-rise low-medium density housing on three sides of the site provides a suburban character to the setting.

Visual receptors of the project site are limited to pedestrians and road users on adjacent roads whose views are not blocked by residential development (i.e. Joseph Street, Betty Cuthbert Drive, Wayland Avenue, Ironbark Way and Bud Greenspan Circuit) and residential properties that back onto the project site boundary.

3.3.2 Considerations

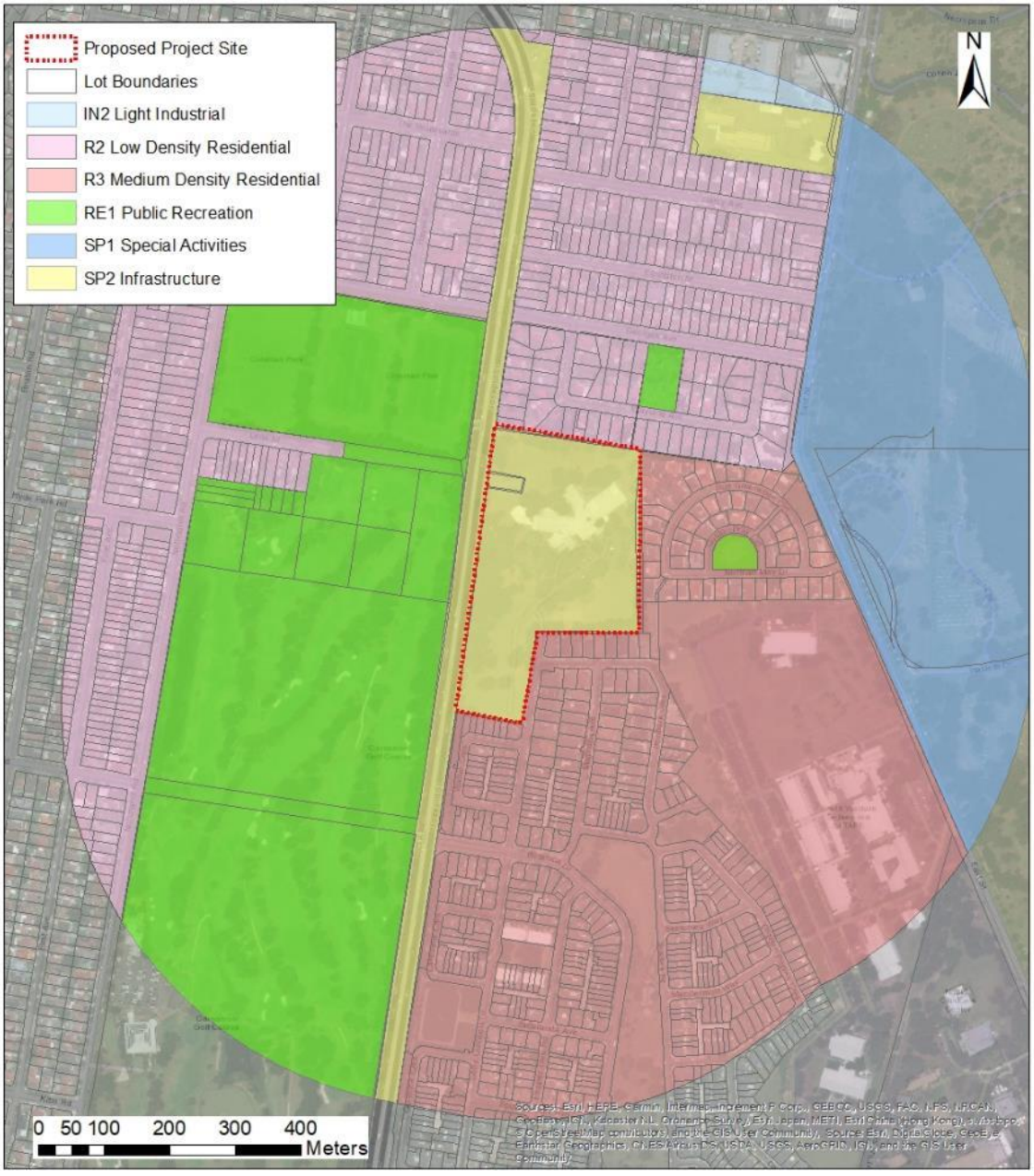
The proposed project has potential to impact the visual amenity and landscape character of the local area. By developing the site, a large area of greenspace will be lost and, as a result, the local landscape setting will appear more developed and urban. This would impact the local visual

receptors, although the impact is not considered to be significant due to the urban setting that prevails already. The view shed and therefore the number of visual receptors would be increased if the project looks to develop building heights in excess of what is currently present in the surrounding area.

3.3.3 Recommendations

Development of the project should respect and enhance the existing landscape character and visual amenity of the site through the use of sensitive building design and project layout. Strategic landscaping should also be used to mask the development from visual receptors and minimise the perceived density of the developed space. This would create a more pleasant setting for future users of the site in comparison to a more traditional residential streetscape.

Figure 10: Land use within 500m of project site



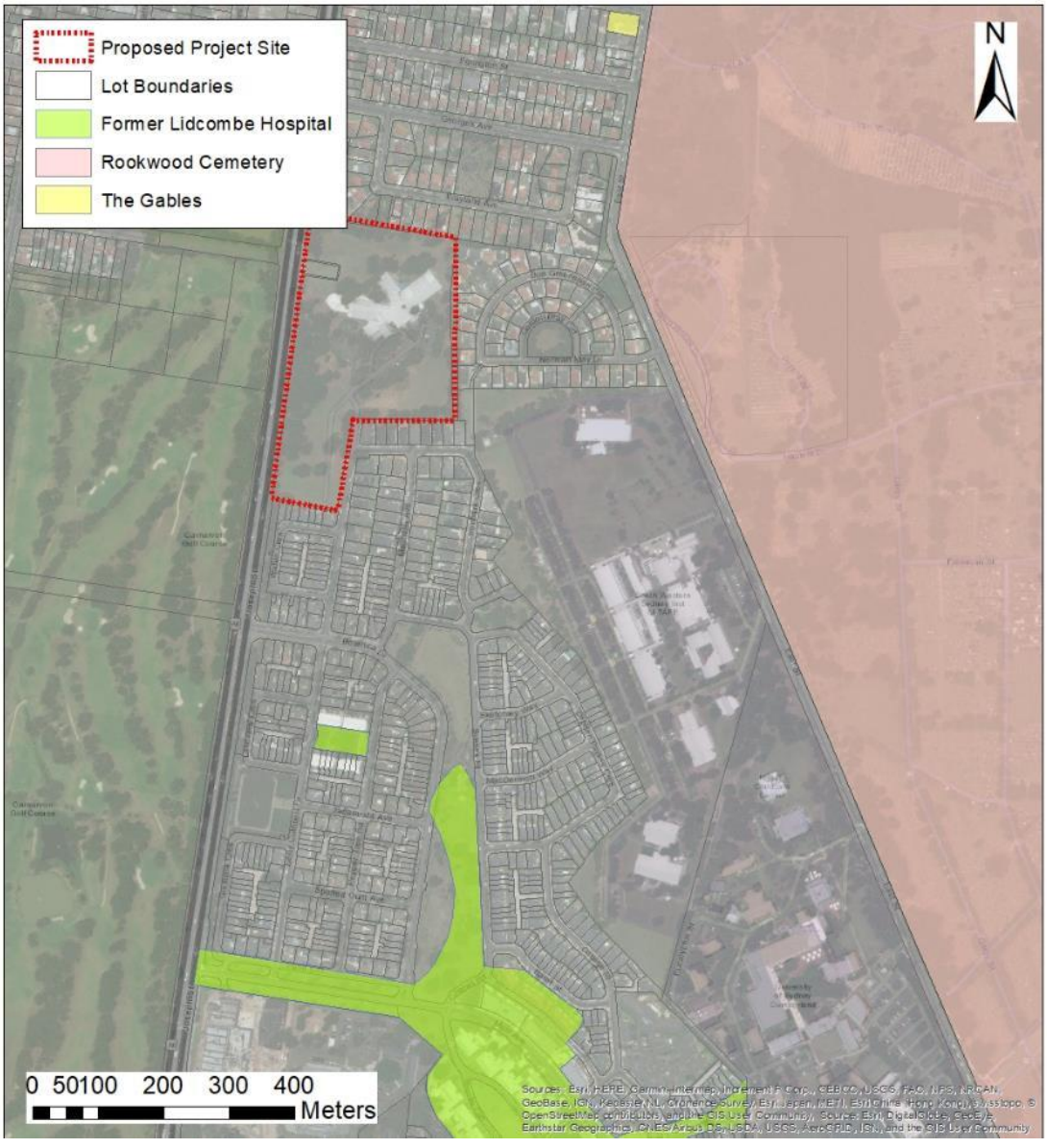
3.4 Heritage

3.4.1 Existing environment

A search using the NSW state heritage register and Cumberland LEP conducted on 14 March 2019 identified two sites of state heritage significance within 500 metres of the project site: Lidcombe hospital precinct and Rockwood cemetery and necropolis, as well as one site of local heritage significance, which is a residential building known as The Gables (Figure 11).

A search using the NSW Aboriginal places register conducted on 14 March 2019 yielded no results for sites of Aboriginal heritage in and near the project site.

Figure 11: Heritage within 500m of the project site



3.4.1.1 Lidcombe hospital precinct

The Lidcombe hospital precinct, which is located 300m to the south of the project site, was in continuous use for over 100 years. It contains a rare collection of architecture and landscapes of the Victorian, Edwardian, Interwar and late-20th Century styles.

3.4.1.2 Rookwood cemetery and necropolis

Rookwood cemetery and necropolis, located 220m east of the project site, is one of the largest burial grounds in the world and contains the largest 19th century cemetery in Australia. The scale of design, gardenesque layout, high quality and diversity of structures, monuments and details of the oldest sections of Rookwood Necropolis represent a rare surviving example of mid to late 19th century ideals for a major public cemetery.

3.4.1.3 The Gables

The Gables is a residential building of local heritage significance, located 350m north east of the project site. It became the home of Frederick Lidbury in 1892, mayor of Rookwood and significant local figure in government. It is a rare example of intact 19th century Victorian Gothic architecture in the municipality, its character and location providing evidence of the influence of transport routes and pastoral activity in the soon-to-be Auburn suburb.

3.4.2 Considerations

Heritage does not need to be considered further by the project due to the absence of heritage within or adjacent to the project site.

3.4.3 Recommendations

No recommendations are made.

3.5 Air quality

3.5.1 Existing environment

A baseline desktop study using the NSW Office of Environment and Heritage air quality database identified Chullora monitoring station as being the closest air quality monitoring station, located in a similar setting just under 2km from the project site. The annual average air quality data recorded at this station is summarised in Table 3-1 below. Air quality at the project site is considered good due to the low number of exceedances recorded since 2014.

Table 3-1: Air quality records for Chullora monitoring station

Date	Sulphur dioxide	Nitrogen dioxide	Carbon monoxide	Ozone	Particulate matter -10µm	Particulate matter - 2.5µm
Maximum standard	20pphm – 1hr average	12pphm – 1hr average	90pphm – 8hr average	10pphm– 1hr average	50µg/m³– 24hr average	25µg/m³– 24hr average
Annual average 2014 to 2018	0.1pphm – 1hr average	1.25pphm – 1hr average	0.28pphm – 1hr average	1.58pphm – 1hr average	19.4µg/m³– 24hr average	8.53 µg/m³– 24hr average
Number of exceedances of maximum standard 2014-2018	0	0	13	5	13	17

Source: NSW Office of Environment and Heritage

The main source of air pollution near the project site is considered to be the traffic along the 6-lane road, Joseph Street, which is adjacent to the western boundary of the site.

The project site is surrounded by residential properties on three sides, which would be the key air quality sensitive receivers for the project.

3.5.2 Considerations

The focus of an impact on air quality from the proposed project would be during the construction phase as the proposed land uses would not involve significant air emissions. Construction can lead to a localised increase in the concentrations of particulates in the air due to dust aerosolisation from civil works. A high density of construction equipment can also influence the local air quality from exhaust emissions.

3.5.3 Recommendations

Construction-generated air quality should be managed as part of a construction environmental management plan through the implementation of mitigation strategies to reduce the impact on surrounding sensitive receivers.

3.6 Surface and groundwater

3.6.1 Existing environment

There are no surface watercourses (i.e. creeks, rivers, etc.) within the immediate catchment of the project site. Runoff from the site is managed through the local stormwater network, including through collection in the on-site stormwater detention basin.

The project site lies within the Bankstown hydrogeological landscape. The hydrogeological landscape is characterised by low hills and rises on Triassic shale and sandstone within the Sydney Basin. It is an area of moderate to high rainfall (over 800mm per year). Groundwater systems are local with short to intermediate flow lengths and are loosely defined by topographic catchments. Water quality within these systems is brackish to saline. Water table depths are intermediate (between 2m and 6m) (NSW Office of Environment and Heritage eSPADE). In the vicinity of the project site, the general hydrogeology consists of porous, extensive aquifers of low to moderate productivity[1].

No groundwater monitoring bores were identified in the local area by undertaking an online search using the Department of Primary Industries (Water) and Water NSW databases. A single groundwater abstraction licence is held at a site 850m to the north of the project site.

3.6.2 Considerations

Due to proposed land uses, the project will likely only interact with the ground water through a pollution pathway during construction.

3.6.3 Recommendations

Construction activities should be managed as part of a construction environmental management plan to ensure groundwater is not impacted by the project.

[1] Harrington N and Cook P (2014) Groundwater in Australia, National Centre for Groundwater Research and Training, Australia

4 Environmentally sustainable design

Opportunities to enhance the site and further reduce environmental risks could be realised through the implementation of sustainability initiatives. The initiatives outlined below are provided as examples of relatively small capital investments that would contribute to reducing further the environmental impact of the proposed development and contribute to wider sustainability performance. These initiatives are all recognised by building certification schemes such as GreenStar, NABERS and the WELL building standard. Developments that are certified under these schemes are often linked with higher rental yields and property resale value.

4.1 Energy and water efficiency

Energy and water efficient design should be considered as early as possible in the design process of any proposed development on the site, but will be especially relevant to residential development, which has a high number of individual end users that could affect the site's overall consumption. By planning for high efficiency, the impact of the development on the wider energy and water networks can be reduced.

The orientation of buildings should be considered to optimise the natural warmth of the sun in the winter months and avoid the need for high usage of cooling equipment in the summer months. The use of insulation to reduce heat loss and passive ventilation design would also contribute to this objective. Additionally, window placement and sizing will also play a role in reducing the need for indoor lighting in residential dwellings, and specification of low energy white goods and LED lighting equipment will contribute to NABERS or Green Star ratings, should these be targeted.

Rainwater harvesting tanks would reduce potable water consumption by providing a recyclable alternative, saving money for the bill payer throughout the life of the development. Rain water can be stored for non-potable uses, such as flushing toilets or watering gardens, and can be returned to the system for filtering and reuse. Collecting excess rainwater can also help to slow flows in a flood event, easing pressure on the surrounding drainage system and reducing the likelihood of surface water flooding. Further water efficiency measures, including the use of greywater recycling systems and low-flow bathroom fittings, are all certifiable under the NABERS and GreenStar certification schemes and should be considered in specifications for any future developments on the site.

4.2 Renewable energy generation

The operational energy demand of the site could be met partially by renewable energy from solar, as the lowest cost renewable source on the market. With the site's position at a high point in the landscape, it will benefit from all-day sun exposure. Further study should be undertaken to identify suitable roof areas for the installation of solar panels, and the contribution that could be made to the site's overall energy demand. Renewable energy can also be provided to the site through the purchase of green power. Onsite renewable energy is also rewarded by Green Star and will support any carbon reduction targets identified for the developments on site.

4.3 Green infrastructure

Much of the existing green space on the site will be redeveloped. Green infrastructure, such as green roofs, green walls and landscaping could help to offset this loss, at the same time delivering numerous environmental benefits for the site. Green infrastructure is important in providing mitigation against climate change, by absorbing atmospheric pollutants (such as carbon dioxide) and solar heat. It also provides environmental benefits by supporting local biodiversity, and contributes to the principles of biophilic design, which is a key element of the WELL building standard.

It should be noted that any planting regime that is selected should consider the future climate conditions, which are likely to involve more extreme temperatures and prolonged periods of drought. Careful plant selection will ensure that the plants remain resilient and do not require much maintenance.

5 Conclusions

5.1 Project considerations

This preliminary environmental assessment report has identified the key environmental considerations for the planning proposal of 80 Betty Cuthbert Drive. This assessment has relied on publicly available data and a site walkover carried out on 7 March 2019. The following environmental considerations are considered key for the development of the project:

- **Noise and vibration** – The development would impact adjacent residents during both construction and operation. The development would be subject to significant noise levels from Joseph Street.
- **Biodiversity** – Development of the site would result in the reduction of total greenspace in the Lidcombe area and potentially break a green linkage between adjacent large areas of greenspace to the west and east. At a site level, the development would impact breeding and foraging opportunities for fauna species, potentially including threatened species, which are of conservation concern. Construction activities could impact protected species as listed in Section 3.2.
- **Landscape and visual** – The Project has the potential to impact the visual amenity and landscape character of the local area.
- **Heritage** - Heritage does not need to be considered further by the project due to the absence of heritage within or adjacent to the project site.
- **Air quality** - The focus of an impact on air quality from the proposed project would be during the construction phase as the proposed land uses would not involve significant air emissions.
- **Surface and groundwater** - Due to proposed land uses, the project will likely only interact with the ground water through a pollution pathway during construction.

The following subjects will be considered in stand-alone reports and therefore were not considered in this report:

- Traffic and transport (report reference: MMD-405675-PP-RP-01)
- Utilities and infrastructure (report reference: MMD-405675-PP-RP-02)
- Flooding and water quality management (report reference: MMD-405675-PP-RP-03)
- Contamination (report reference: MMD-405675-PP-RP-04).

5.2 Project development recommendations

The following recommendations are suggested to address the identified project considerations and to fill any data gaps that are apparent:

5.2.1 Noise and vibration

- The design and layout of the project should consider the adjacent sensitive receivers (residential properties) with the objective to avoid increasing the ambient noise levels they experience when the site has been developed.
- High existing noise levels along the western side of the project should be considered in the layout and design of the project.
- Noise abatement mitigation strategies should form part of a construction environmental management plan.

5.2.2 Biodiversity

- Minimise the number of native trees removed and avoid removal of mature individuals that offer niches (e.g. cracks, crevices and lifted bark) for threatened species
- Target a net gain in the number of trees following development
- Landscape planting should focus on native species and provide complex habitat where possible, including ground-cover vegetation, mid-height bushes and trees
- Enhancement of the detention pond and other proposed water bodies for amphibians, including: pond profiling, in-water and surrounding vegetation, and connectivity with nearby habitats to offer suitable habitat for all life-stages
- Connectivity through the site should be maintained through landscape design; unbroken planting at ground and flight level that link the green spaces to the east and west of the site
- Lighting design should avoid the over-illumination of vegetated areas
- Survey of trees and the detention pond for their potential for protected species; as a minimum the study should include those that will be impacted by the development (completed)
- Detailed survey of the site for downy wattle (completed)
- Construction environmental management plan including strategies to avoid harm to protected species

5.2.3 Landscape and visual amenity

- Development of the project should respect and enhance the existing landscape character and visual amenity of the site

5.2.4 Heritage

- Heritage does not need to be considered further by the project due to the absence of heritage within or adjacent to the project site.

5.2.5 Air quality

- Construction-generated air quality should be managed as part of a construction environmental management plan through the implementation of mitigation strategies to reduce the impact on surrounding sensitive receivers.

5.2.6 Surface and groundwater

- Construction activities should be managed as part of a construction environmental management plan to ensure groundwater is not impacted by the project.

5.3 Environmentally sustainable design

Opportunities to enhance the site and further reduce environmental risks could be realised through the implementation of environmentally sustainable design initiatives, including:

- Energy and water efficiency
- Renewable energy generation
- Green infrastructure

Appendices

A. OEH BioNet records

A.1 Threatened species records

Fauna

- Green and Golden Bell Frog (*Litoria aurea*) – 983 sightings
- Black Bittern (*Ixobrychus flavicollis*) – 1 sighting
- Spotted Harrier (*Circus assimilis*) – 1 sighting
- White-bellied Sea-Eagle (*Haliaeetus leucogaster*) – 26 sightings
- Little Eagle (*Hieraaetus morphnoides*) – 1 sighting
- Eastern Osprey (*Pandion cristatus*) – 1 sighting
- Australian Painted Snipe (*Rostratula australis*) – 1 sighting
- Curlew Sandpiper (*Calidris ferruginea*) – 3 sightings
- Great Knot (*Calidris tenuirostris*) – 1 sighting
- Broad-billed Sandpiper (*Limicola falcinellus*) – 1 sighting
- Black-tailed Godwit (*Limosa limosa*) – 1 sighting
- Little Tern (*Sternula albifrons*) – 1 sighting
- Swift Parrot (*Lathamus discolour*) – 1 sighting
- Powerful Owl (*Ninox strenua*) – 5 sightings
- Eastern Grass Owl (*Tyto longimembris*) – 1 sighting
- Regent Honeyeater (*Anthochaera Phrygia*) – 1 sighting
- Dusky Woodswallow (*Artamus cyanopterus cyanopterus*) – 2 sightings
- Grey-headed Flying-fox (*Pteropus poliocephalus*) – 12 sightings
- Yellow-bellied Sheathtail-bat (*Saccolaimus flaviventris*) – 1 sighting
- Eastern Freetail-bat (*Mormopterus norfolkensis*) – 1 sighting
- Eastern Bentwing-bat (*Miniopterus schreibersii oceanensis*) – 32 sightings
- Southern Myotis (*Myotis Macropus*) – 10 sightings

Flora

- Tadgell's Bluebell (*Wahlenbergia multicaulis*) – 15 sightings
- Narrow-leafed Wilsonia (*Wilsonia backhousei*) – 1 sighting
- Epacris purpurascens (*Epacris purpurascens var. purpurascens*) – 1 sighting
- Downy Wattle (*Acacia pubescens*) – 53 sightings
- Magenta Lilly Pilly (*Syzygium paniculatum*) – 1 sighting
- Pomaderris prunifolia (*Pomaderris prunifolia*) – 2 sightings
- Zannichellia palustris (*Zannichellia palustris*) – 1 sighting

A.2 Non-threatened species records (top five most frequent)

Amphibia

- Eastern Dwarf Tree Frog (*Litoria fallax*) – 978 sightings
- Brown-striped Frog (*Limnodynastes peronii*) – 559 sightings
- Peron's Tree Frog (*Litoria peronii*) – 493 sightings
- Common Eastern Froglet (*Crinia signifera*) – 259 sightings

Aves

- Noisy Miner (*Manorina melanocephala*) – 732 sightings

- Superb Fairy-wren (*Malurus cyaneus*) – 726 sightings
- Australian White Ibis (*Threskiornis Molucca*) – 572 sightings
- Australian Raven (*Corvus coronoides*) – 572 sightings
- Welcome Swallow (*Hirundo neoxena*) – 501 sightings

Reptilia

- Eastern Water-skink (*Eulamprus quoyii*) – 75 sightings
- Dark-flecked Garden Sunskink (*Lampropholis delicata*) – 56 sightings
- Eastern Blue-tongue (*Tiliqua scincoides*) – 37 sightings
- Eastern Snake-necked Turtle (*Chelodina longicollis*) – 29 sightings
- Pale-flecked Garden Sunskink (*Lampropholis guichenoti*) – 26 sightings

Mammalia

- Gould's Wattled Bat (*Chalinolobus gouldii*) – 40 sightings
- White-striped Freetail-bat (*Austronomus australis*) – 34 sightings
- Lesser Long-eared Bat (*Nyctophilus geoffroyi*) – 33 sightings
- Eastern Bentwing-bat (Miniopterus schreibersii oceanensis) – 32 sightings
- Common Ringtail Possum (*Pseudocheirus peregrinus*) – 25 sightings