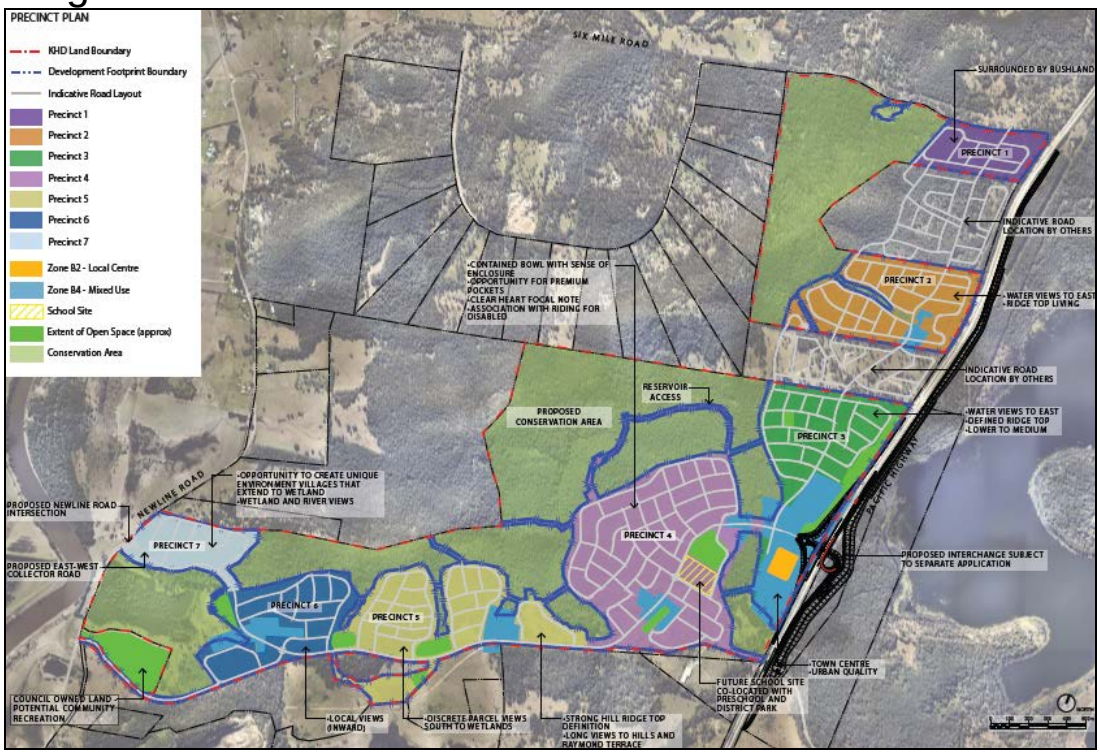
JW Planning Pty Ltd
Level 1 Suite 13/478 The Esplanade
Warners Bay NSW 2282
email@jwplanning.com.au
Fax: (02) 49 484 366
Ph: (02) 49 484 322
ABN 45 102 698 242

Concept Development Application

Pursuant to Section 4.22 of the Environmental Planning & Assessment Act 1979

Kings Hill Urban Release Area



Concept Proposal for Residential Subdivision & Stage 1 Subdivision Works (Initial Site Preparation Works) & Establishment of In-Perpetuity Conservation Area

Lot 41 DP 1037411 and Lot 4821 DP 852073
3221 Pacific Highway and 35 Six Mile Road Kings Hill
KINGS HILL URBAN RELEASE AREA

Applicant: Kings Hill Developments PTY LTD
23 November 2018 (as revised to address matters raised during assessment - 27 July 2020)
PSC Ref: DA 16-2018-772-1

JW Planning Pty Ltd

Town Planning

Level 1, Suite 13/478 The Esplanade
WARNERS BAY NSW 2282
Tel: 02 4948 4322
Fax: 02 4948 4366
Email: email@jwplanning.com.au

CONTENTS

FIGURES

TABLES

ATTACHMENTS

A. DA Modification Details
B. Pre-Da Minutes
C. Constraints Plan
D. Development Plans
E. Engineering Report
F. Traffic Technical Design Note
G. Biodiversity Management Plan
H. Species Impact Statement
I. Key Fish Habitat Assessment
J. Geotechnical Investigations
K. Archaeological Assessment
L. Pacific Highway Interchange
M. Wetland Impact Assessment
N. Vegetation Management Plan
O. Pacific Highway Acoustic Assessment
P. Bush Fire Assessment
Q. Deposited Plans
R. Community Consultation Plans and Report
S. Economic Impact Assessment

LIMITATION OF URBAN PLANNING SERVICES

PLEASE NOTE – JW PLANNING PTY LTD, WHEN DEEMED THE APPLICANT OR ASSISTING THE APPLICANT, WILL NOT BE LIABLE FOR WORKS UNDERTAKEN ON THE SUBJECT SITE, WHETHER PROPOSED OR NOT UNDER THIS REPORT, DURING OR AFTER THE ASSESSMENT OF THIS REPORT.

Scope of Services
This planning report or application (**report**) has been prepared in accordance with the scope of services set out in the contract, or as otherwise agreed, between the Client and JW PLANNING PTY LTD (**scope of services**). In some circumstances the scope of services may have been limited by a range of factors such as time, budget, access and/or site constraints.

Reliance on Data
In preparing this report JW PLANNING PTY LTD has relied upon data, surveys, analyses, designs, plans and other information provided by the client and other individuals and organisations, most of which are referred to in the report (**the data**). Except as otherwise stated in the report, JW PLANNING PTY LTD has not verified the accuracy or completeness of that data. To the extent that the statements, opinions, facts, information, conclusions and/or recommendations in the report are based on in whole or part on the data, those conclusions are contingent upon the accuracy and completeness of that data. JW PLANNING PTY LTD will not be liable in relation to incorrect conclusions should any data, information or condition be incorrect or have been concealed, withheld, misrepresented or otherwise not fully disclosed to JW PLANNING PTY LTD.

Other Limitations
JW PLANNING PTY LTD will not be liable to update or revise the report to take into account any events or emergent circumstances or facts occurring or becoming apparent after the date of the report.

Précis

Land at Kings Hill was identified by Port Stephens Council (PSC) in successive Settlement Strategies since the early 1990s, and the Council subsequently resolved to rezone the Kings Hill Urban Release Area (KHURA) 17 years ago; in October 2002.

Eight years later (2010), and three years after KHURA was endorsed as **1 of 4 priority urban release areas** by the state government in the Lower Hunter Regional Strategy (2007), the rural zoned land was rezoned to enable a mix of housing, employment and conservation outcomes. In mid-2012, two large parcels of land in KHURA were acquired by Kings Hill Developments Pty Ltd (KHD).

This Development Application (DA) relates only to KHD's land (some 64% of the KHURA), and seeks Development Consent for a Concept Proposal for Future Residential Subdivision and Stage 1 Subdivision Works (Initial Site Preparation Works) including Establishment of in-perpetuity Conservation Area.

The Concept Proposal for future subdivision proposes a target of 1,900 residential lots, including 6 mixed use lots, 1 local centre, parks and 1 school site.

Other than the activities proposed in Stage 1, an approval of the Concept Proposal for future subdivision will not permit carrying out subdivision of the land; it will however provide confidence as to an approved form of development permitted by subsequent applications to carry out subdivision.

Following 5 years of consultation with the state government, specifically the Departments of Planning and Environment, Roads and Maritime Services, and more recently, Premiers and Cabinet, a Voluntary Planning Agreement (VPA) confirming arrangements for the funding and delivery of $80M in infrastructure to enable the KHURA was executed in October 2019.

Execution of the VPA recognises the significant social and economic benefits that will derive from the development of the KHURA. The URA will sustainably place affordable housing within some 20 minutes commute of existing and emerging employment areas which are forecast to provide about 50% of the new jobs in the Lower Hunter over the next 12 years.

When completed, the URA is estimated to provide a direct $140 million in value into the local economy annually, with expenditure on upfront infrastructure expected to total $105.4 million whilst the cost of the construction of the development is expected to total $1.1 billion (2018 dollars). Construction of the development alone is expected to generate 177 full-time equivalent jobs per annum directly in the construction industry over a 15-year period, and ongoing full-time employment for some 279 residents when the development is completed. Investment from businesses located in the KHURA has the potential to provide direct ongoing employment for at least 885 people.

The KHD land involves former rural zoned land generally disturbed by a history of logging and quarrying, and weed and pest invasion associated with uncontrolled grazing activities. Nonetheless, there are inherent biodiversity values in certain areas of the site that the Concept Development responds too, and a *Species Impact Statement* (SIS) accompanies this application to inform and enable an assessment of the environmental impacts.

The assessment determined long term sustainable avoidance and mitigation measures that are adopted by the Concept Development, including the preparation and establishment of a 244.25ha Conservation Area to be funded and managed in perpetuity under a VPA between KHD and PSC.

The recommendations of the SIS will enable KHD's land to fulfil a substantial proportion of the socio-economic benefits derived by the URA without significant environmental impact.

The proposal complies with the relevant statutory and strategic planning provisions, and the relevant planning instruments that apply to the land. A 2014 survey of 600 Port Stephens residents (200 households per ward) by *CT Group* found 72% support for the KHURA, with the balance mostly undecided or unfamiliar with the URA.

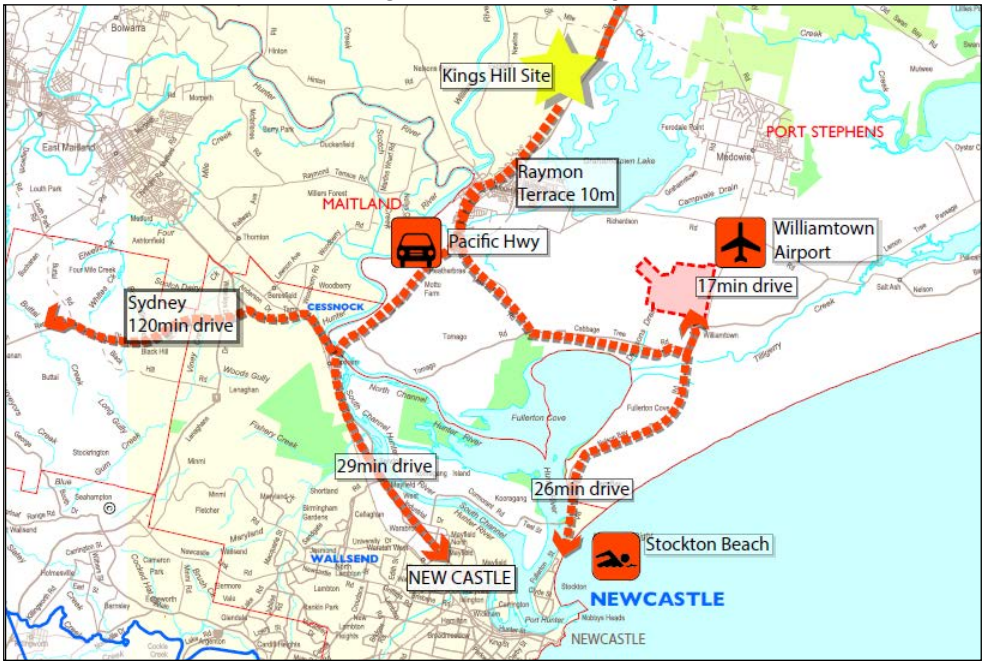
More recently (in June 2019), KHD voluntarily advertised and conducted two (2) Community Drop-In Sessions. A report on the outcomes of that process indicates that the proposal was well received and is consistent with community expectations.

The Kings Hill URA forms part of the NSW government's *Hunter Regional Plan 2036* and the *Greater Newcastle Metropolitan Plan 2036*, which identifies the Kings Hill Urban Release Area as the largest and most important release area in the 2036 time horizon for Port Stephens LGA.

1.0 INTRODUCTION

Kings Hill is an Urban Release Area within the Port Stephens Local Government Area of New South Wales (see **Figure 1**).

Figure 1 Site Locality



Source: PDS Patterson Design Studio

This application is made on behalf of Kings Hill Developments (KHD) Pty Ltd, the owners of land within the Kings Hill Urban Release Area (KHURA) (see **Figure 2**).

Figure 2 Kings Hill URA and Context

Source: JWP

KHD's land is legally described as Lot 41 DP 1037411 and Lot 4821 DP 852073, 3221 Pacific Highway and 35 Six Mile Road (respectively), Kings Hill NSW (**'the site'**).

Figure 3 The Site - Lot 41 DP 1037411 & Lot 4821 DP 852073

Source: JWP based on SIX Maps

The objective of this application is to seek Concept Development approval for the site, approval to carry out the first stage of Subdivision Works in the form of initial site preparation works to enable future Residential Subdivision, the establishment of a Conservation Area for in-perpetuity biodiversity protection and management within the local area (**'the Proposal'**).

The Concept Proposal proposes future subdivision of the site with a target yield of 1,900 residential lots. Key aspects of the proposal are provided in **Section 3.0**, with relevantly detailed plans and reports provided in the **Attachments**.

Clauses 6.1 and 6.5 of the Port Stephens Local Environmental Plan (PLEP 2013) state that Council must not grant consent for subdivision until infrastructure arrangements are made in consultation with the NSW state government. More particularly, this entails execution of a Voluntary Planning Agreement (VPA) for the funding and delivery of infrastructure that will enable the KHURA. Although approval of the Concept Development Application will not permit subdivision to be carried out, a VPA between KHD and the NSW Department of Planning was executed on 25 October 2019, allowing this application to be progressed without uncertainty.

On approval, the Concept DA will provide certainty to stakeholders and the community as to the nature of development and conservation endorsed for the land, and as subsequent DAs must not be inconsistent with an approved Concept, an approval will provide a framework that ought to enable confidence in the assessment of subsequent Development Applications for subdivision, and thereby allow land for new homes to be delivered to the market as soon as possible.

Although the land involves former rural zoned land generally disturbed by a history of logging and quarrying, and weed and pest invasion associated with uncontrolled grazing activities, there are inherent biodiversity values in certain areas of the site that the Concept Development responds too. The overarching objective of the proposal is therefore to restore and deliver long term sustainable conservation outcomes in appropriate areas of the site, while also providing for high quality, serviced residential land with convenient access to essential services and facilities, and employment growth centres in the Port Stephens and the Lower Hunter.

1.1 Purpose of this Report

This application has been prepared to address compliance of the proposal with relevant environmental planning instruments and development controls applicable to the site and its context.

The proposal has been informed by information that accompanies this application, notably:

- Ecological assessment, including:
    - Species Impact Statement (SIS) for the site and context
    - Biodiversity Management Plan (BMP) for the proposed Conservation Area
    - Vegetation Management Plan (VMP) for the proposed Development Area
    - Wetland Hydrological and Vegetation impact assessment
    - Key Fish Habitat assessment
- Bushfire assessment
- Geotechnical assessment
- Archaeological assessment
- Engineering assessment - preliminary stormwater management and road design
- Traffic impact assessment
- Acoustic impact assessment
- Economic assessment
- Community Engagement report

The application is prepared in accordance with Part 4, Section 4.15 of the Environmental Planning and Assessment Act 1979, with particular regard to:

- Environmental Planning and Assessment Regulation 2000;
- Relevant State and Federal Legislation;
- Relevant State Environmental Planning Policies (SEPPs);
- Port Stephens Local Environmental Plan 2013 (LEP); and
- Port Stephens Development Control Plan 2014 (DCP).

1.2 Structure of this Report

The following details are presented to enable an assessment of the proposal:

Section 1.0 Introduction

Section 2.0 Site Details

Section 3.0 Details of the Proposal

Section 4.0 Statement of Environmental Effects

Section 5.0 Development Compliance

Section 6.0 Conclusion

The Recommendations provided throughout this report may form the basis of the conditions of development consent associated with this application, and subsequent development consents for subdivision consistent with the Concept Proposal.

1.3 Limitations of this Application

The Environmental Planning and Assessment Act 1979 (EP&A Act 1979) provides that the consent authority need only consider the likely impact of a Concept Proposal, and not the likely impact of carrying out any aspect of the development that is to be the subject of subsequent development applications: Relevantly:

> ***Clause 4.22 Concept development applications***
>
> *(1) For the purposes of this Act, a **concept development application** is a development application that sets out concept proposals for the development of a site, and for which detailed proposals for the site or for separate parts of the site are to be the subject of a subsequent development application or applications.*
>
> *(4) If consent is granted on the determination of a concept development application, the consent does not authorise the carrying out of development on any part of the site concerned unless—*
>
> > *(a) consent is subsequently granted to carry out development on that part of the site following a further development application in respect of that part of the site, or*
> >
> > *(b) the concept development application also provided the requisite details of the development on that part of the site and consent is granted for that first stage of development without the need for further consent.*
>
> *(5) The consent authority…need only consider the likely impact of the concept proposals (and any first stage of development included in the application) and does not need to consider the likely impact of the carrying out of development that may be the subject of subsequent development applications.*

This application seeks development consent for a Concept Proposal for future residential subdivision, meaning development consent to carryout residential subdivision will be the subject of subsequent development applications. Details of the Concept Proposal relating to subdivision are therefore limited to enabling an assessment of likely impacts of the Proposal.

The application also seeks development consent to carry-out Stage 1 of the Proposal, being Subdivision Works (initial site preparation works) and the establishment of an in-perpetuity Conservation Area. The details of Stage 1 works are provided in this application to enable the assessment, approval, and carrying out of those works. Some of those works can be undertaken without further approval (for example, Biosecurity Act compliance, bushfire management, or rural land use activities under Existing Use Rights) while other works under Stage 1 will need approval of a Subdivision Works Certificate and/or other forms of approval prior to carrying out the works.

1.4 Background

KHD has invested significant resources in the project since acquiring the site mid-2012. While the site is zoned to allow residential development, considerable investment is required to fund and deliver the infrastructure necessary to enable development of the URA. Consequently, after becoming acquainted with the site, KHD along with other land owners in the KHURA, made an Offer to enter in to a Voluntary Planning Agreement (VPA) with the state government at the end of 2014.

The proposed VPA sought to provide a funding mechanism for reasonable and proportionate contributions by all landowners toward the cost of designated state public infrastructure.

A multitude of legal and technical limitations lead to protracted negotiations with the state, however a mechanism has now been devised and a VPA for KHD's land was executed 25 October 2019.
KHD has invested over $19.7m (not including holding costs) to date since acquiring the rezoned land in 2012, with significant progress at all levels of the project planning, including but not limited to:

- Agreement reached and executed with the state government on the funding and delivery of key enabling infrastructure such as an interchange for primary access to the KHURA from the Pacific Hwy, a Stormwater Channel along the eastern side of the Pacific Highway and land for a public school;
- Acquisition of Hunter Water Corporation (HWC) land on the east side of the Pacific Hwy for the purposes of constructing the required interchange;
- Final Concept Design approved by Transport for New South Wales (TfNSW) for Interchange*;
- Detailed design of Stormwater Channel in consultation with Council and Hunter Water Corporation (HWC) to protect Grahamstown Dam and downstream wetlands*;
- Review of Environmental Factors (REF) for the Interchange complete for RMS review prior to public exhibition*;
- Review of Environmental Factors (REF) documented for the Stormwater Channel for RMS review prior to public exhibition*;
- Design and approvals for Utility Diversions to enable the interchange delivery*;
- Bulk water and sewer servicing strategies endorsed by HWC;
- Consult with Commonwealth Environment Department as to the EPBC referral approach for the URA;
- Ongoing environmental assessment and monitoring, including a specialist Koala assessment to inform measures for impact avoidance or mitigation, appropriate offsets, staging and design considerations, and production of a Species Impact Statement (SIS), a Biodiversity Management Plan, and a Vegetation Management Plan;
- Preliminary engineering design of internal roads, internal intersections, culverts and bridging, external intersection with Newline Road, drainage and stormwater management, subdivision design, and internal sewer and water reticulation;
- Determination of infrastructure costs based on preliminary engineering design submitted to Council in 2017 to enable Council to prepare a s7.11 Contributions Plan for the URA;
- Environmental Impact Assessment for the Water and Sewer Mains supplying the KHURA lodged with Council in February 2020; and
- Complete ground level detail survey of the site and associated road access locations to enable accuracy with design and assessment of preliminary engineering, and confidence in the development footprint.

*URA Enabling Infrastructure that is the subject of separate approvals process.

1.5 Application History

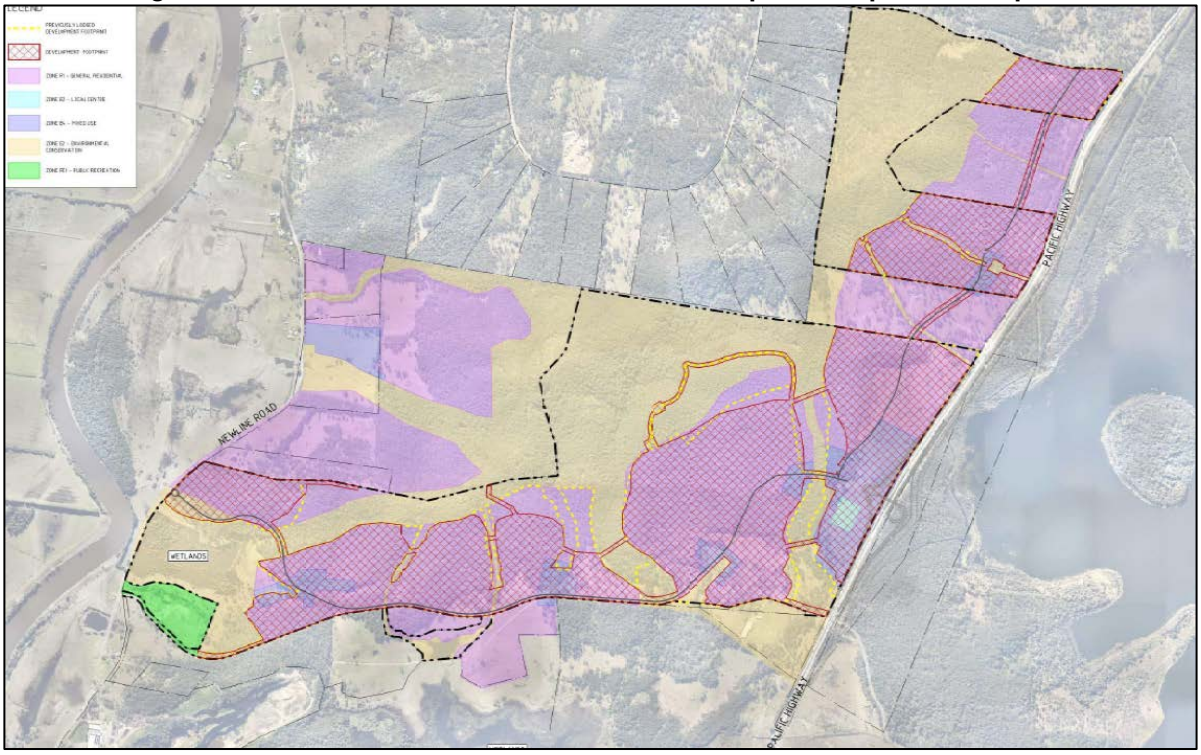
This application was originally submitted to Port Stephens Council on 23 November 2018 (**DA 16-2018-772-1**).

Following a request for improved clarity in the plans and additional information relating to the ecological assessment, the proposal and the development application was altered and resubmitted in May 2019 to enable public notification between 6 June 2019 and 11 July 2019. **Attachment A** and **Figure 4** below illustrate the extent of modification to the development footprint in submitted in November 2018.

A further request for information was issued to KHD on 11 July 2019 resulting from Council's internal review of the application. Community submissions made during the public notification period, and agency comments were issued to KHD progressively as they became available in the weeks that followed.

The application is now further revised to address the range of matters raised as a result of the consultation in June 2019 and Council's ongoing assessment in June 2020. These modifications provide more substantial evidence and details of the environmental management proposed by the application.

Figure 4 Current v Former November 2018 Concept Development Footprint



Source: Northrop

1.6 Consultation

There has been considerable consultation with all levels of government, a very broad range of government agencies, the community, and adjoining landowners since 2002.

Most relevantly, however, KHD has consulted with the following stakeholders prior to or since lodgement of the application:

Commonwealth Department of the Environment and Energy on Environmental Protection and Biodiversity Conservation Act referral and process matters (ACT in Sydney)

Office of Environment and Heritage (OEH) as to SIS matters (Hunter)

Department of Planning, Infrastructure and Environment (Sydney)

Department for Transport/Roads and Maritime Services (Sydney and Hunter)

Department of Education (Sydney)

Department of Premier and Cabinet (Sydney)

Hunter Water Corporation

Port Stephens Council

Adjoining land owners - Suez Waste Facility, Hunter Land, Gwynvill, Riding for the Disabled

A pre-DA meeting for this development application was held with Port Stephens Council on 18 September, 2018. The minutes resulting from this meeting are included as **Attachment B**, and the matters raised are addressed within this application. Consultation with Council and the abovementioned stakeholders has continued since lodgement of the DA.

Additionally, KHD commissioned RPS Group to openly advertise and conduct two (2) Community Drop-In Sessions in June 2019. The purpose of the sessions was to provide the community an opportunity to familiarise with the proposal and clarify any concerns with the KHD project team.

The sessions were timed to enable informed submissions during the Council's public notification period. A report as to the outcomes of the consultation was issued to Council on 9 July 2019 during the notification period, and the report indicates that the proposal was well received and consistent with community expectations (see **Attachment R**).The consultation has informed the proposal by identifying issues that need to be considered and addressed by the application.

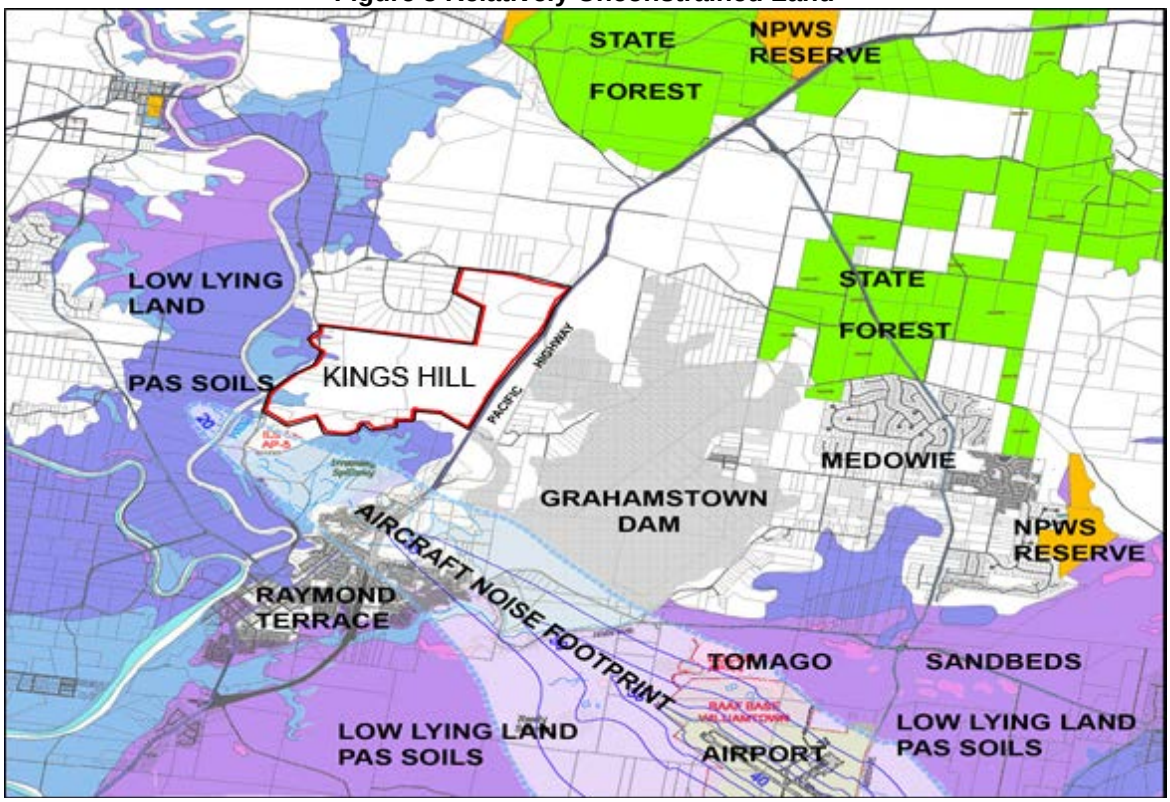
2.0 THE SITE

2.1 Strategic Planning Context

Council formally resolved to rezone the Urban Release Area (URA) in 2002 after successive Council Settlement Strategies during the 1980s and 1990s identified the area as both suitable and capable of accommodating forecast population and jobs growth.

The area comprised land disturbed by a history of grazing, quarrying, and logging, and represented the least constrained land in close proximity to the regional administrative centre of Raymond Terrace. Additionally, the landownership was relatively un-fragmented, thus enabling efficient and coordinated development outcomes (see **Figure 5**).

Figure 5 Relatively Unconstrained Land



Source: JWP

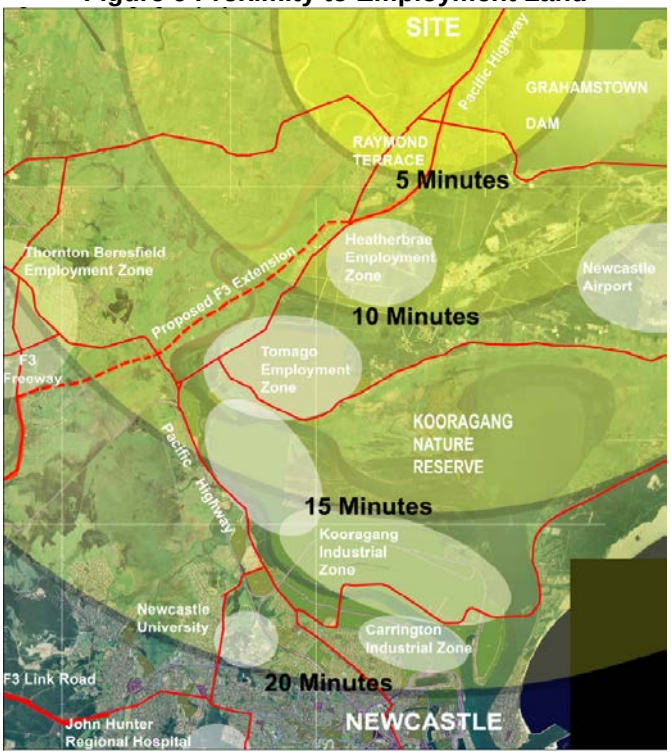
In particular, the area was identified by successive Council strategies for its potential to:

- add critical mass to the population supporting the centre Raymond Terrace, ensuring that existing public and private investment in services and facilities remain sustainable; and

> *".....for historical reasons, Raymond Terrace has well-developed infrastructure, both public and private, is readily accessible to employment opportunities, to other regional centres and to surrounding rural residential districts.*
>
> *It is important to support and to make effective use of the public and private investment in Raymond Terrace, and to further investigate residential opportunities to utilise this infrastructure."*
>
> Source: Raymond Terrace Local Area Plan 2002

- to accommodate the demand for housing associated with the growth of employment areas in Port Stephens and the Lower Hunter (see **Figure 6**).

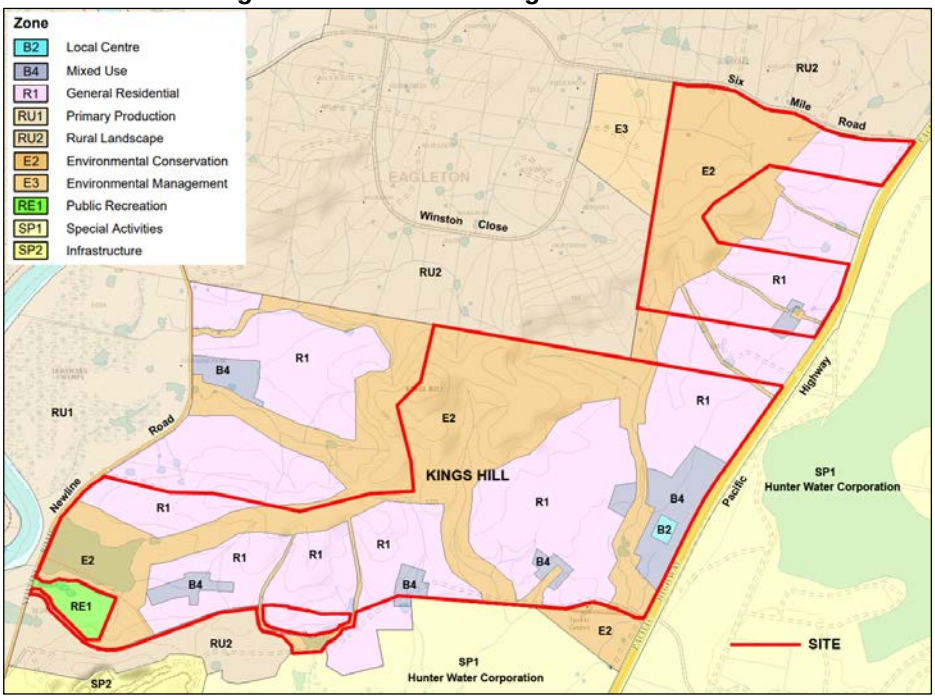
Figure 6 Proximity to Employment Land



Source: JWP (2007)

In 2007, the NSW State Government recognised these attributes and identified the land as 1 of 4 priority urban release areas in the *Lower Hunter Regional Strategy*. Subsequently, after an 8 year rezoning process, the land was rezoned in 2010 to enable a mix of urban and conservation outcomes (see **Figure 7**).

Figure 7 Land Use Zoning – PSLEP 2013



Source: JWP based on NSW Planning Portal

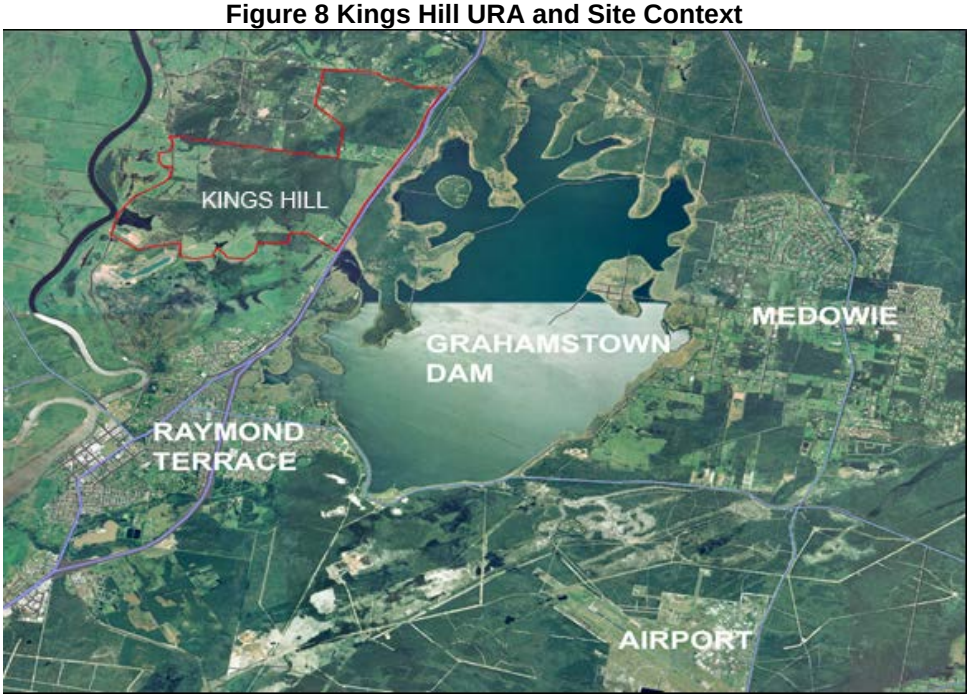
The rezoning process resulted in a stand-alone Local Environmental Plan known as Port Stephens Local Environmental Plan (Kings Hill, North Raymond Terrace) 2010. The stand-alone LEP was later consolidated in to the Standard Instrument Local Environmental Plan, being the current *Port Stephens Local Environmental Plan (2013)* (PSLEP 2013).

In July 2016, the NSW government gazetted the suburb name of Kings Hill and today, the Kings Hill URA forms part of the NSW government's *Hunter Regional Plan 2036* and the *Greater Newcastle Metropolitan Plan 2036* (which identifies the Kings Hill Urban Release Area as the largest and most important release areas in the 2036 time horizon for Port Stephens LGA).Together, these plans outline strategies and actions to provide for integrated land use and resourcing to contribute to the growth of the Newcastle and Hunter Regions.

2.2 The Site and Locality

The Kings Hill URA is located approximately 4 km north of the regional centre of Raymond Terrace (see **Figure 8**).

Figure 8 Kings Hill URA and Site Context



Source: JWP

The KHD land is north of the Hunter Water Corporation Grahamstown Dam spillway with the Pacific Highway forming the eastern boundary, and Newline Road forming the western boundary. Six Mile Road forms a northern boundary to KHDs land (see **Figure 9**).

Figure 9 Subject Land - Lot 41 DP 1037411 & Lot 4821 DP 852073

Source: JWP based on SIX Maps

The combined area of the site is 517.13ha. About 205.8ha of the site is zoned E2 Environmental Conservation, whereas some 311.4ha of the site is zoned for urban purposes.

2.3 Site Analysis

An extensive analysis of the site constraints and opportunities has been carried out over the land since 2003, culminating in an up to date *Site Constraints Plan* (see **Figure 8** and **Attachment C**).

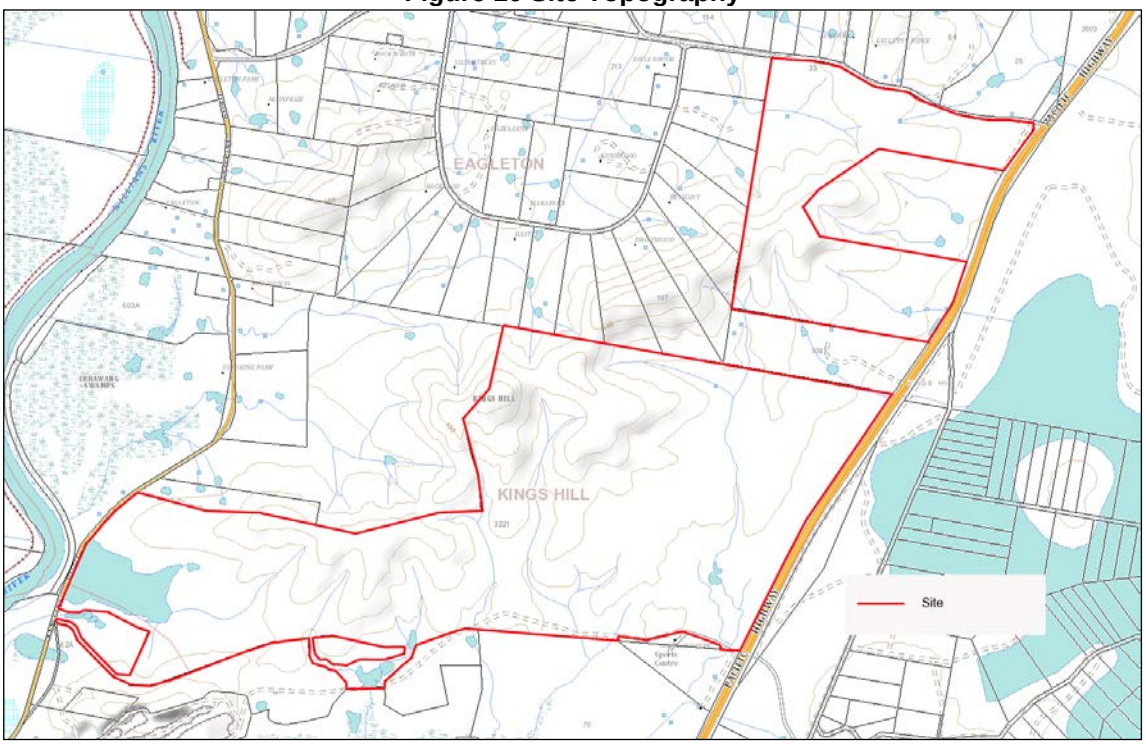
The analysis considers the opportunities and constraints of:

- Topography and Slope Analysis;
- Visual Context;
- Geotechnical environment;
- Drainage catchments and watercourses;
- Flooding and Coastal Wetlands;
- Biodiversity;
- Bushfire prone lands;
- Aboriginal Archaeology
- Potential Contamination
- Buffers to adjoining land uses;
- Vehicle Access and Egress;
- Potential acoustic impact of Pacific Highway and Aircraft; and
- Existing and potential capacity of Utilities Infrastructure

2.3.1 Slope Analysis

The KHURA comprises land ranging from about 10m AHD to 130m AHD, with the highest point known as 'Kings Hill'. The URA comprises an elevated ridgeline traversing the land with a southwest-northeast orientation. The ridgeline forms a 'backdrop' to the urban zoned land, which generally has a south, southeast, and eastern aspect (see **Figure 10**).

Figure 10 Site Topography

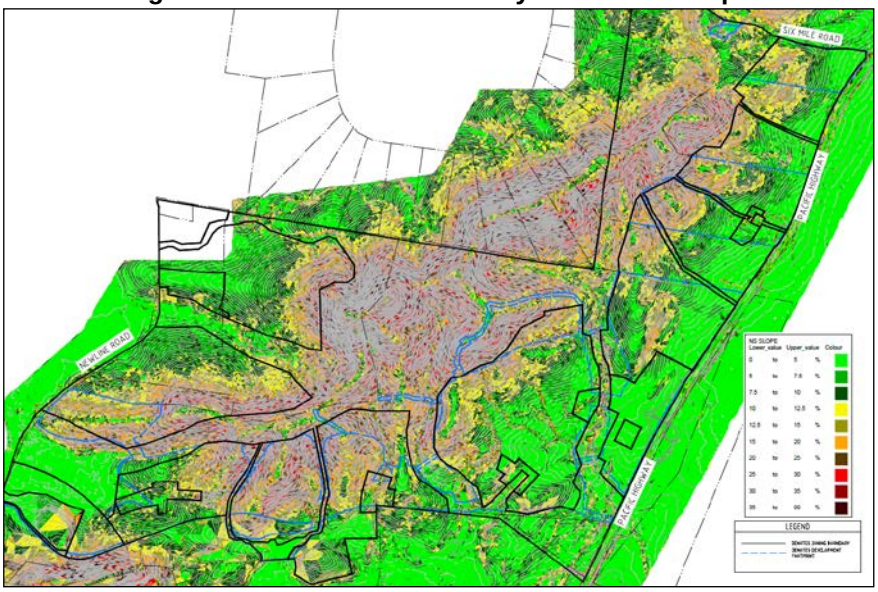


Source: JWP based on NSW Government Spatial Services Map

As apparent from **Figure 7**, and although a range of environmental factors informed the zone types and the zone boundaries, there is generally a correlation between the zoning and the site terrain, with the elevated ridgelines and drainage lines retained within the E2 Conservation zone, and the ridgeline flanks and associated slopes zoned for urban purposes (R1 Residential, B4 Mixed Use, and B2 Commercial zones).

With additional and more detailed environmental and design investigations, including a complete detail survey of ground levels and site features, a less extensive development footprint than enabled by the site zoning emerged, with the resulting Concept development area relative to the zone boundaries and the topography is illustrated in **Figure 11**.

Figure 11 Urban Zone Boundary Relative to Slope



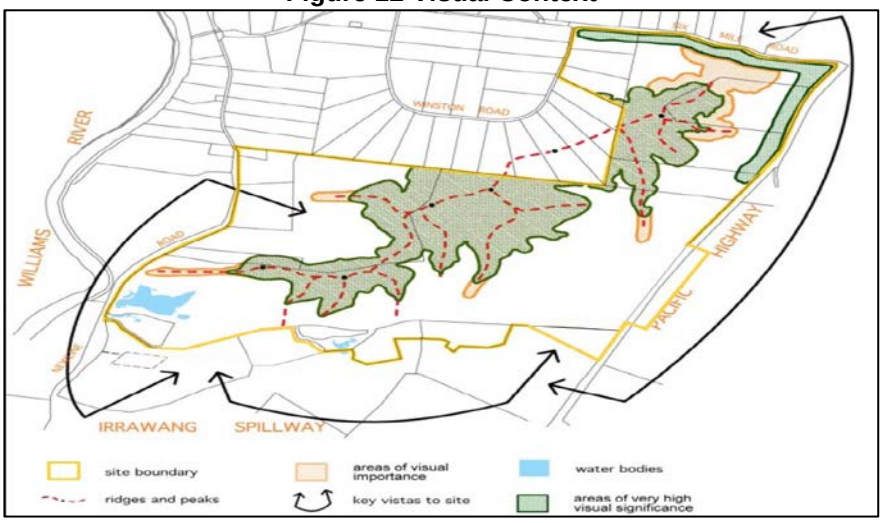
Source: Nothrop Engineers

The Concept development area under this application predominately involves land with slope that is between 0% and 10% (up to 6 degrees - depicted green). Elevated areas, particularly the southern and western flanks of the site, involve land more typically up to 20% slope (up to 11.5 degrees - depicted yellow and brown), with very occasional areas of up to 30% slope (17 degrees – depicted red) - see **Figure 11**.

2.3.2 Visual Context

The site is most commonly viewed from the Pacific Highway, and the steep terrain and tree cover associated with the elevated ridgeline, provides views of scenic amenity. A visual assessment during the rezoning by urban designers, Deicke Richards, determined that the more visible land is generally as of the 1 in 4 slopes, complimented when on the site or when viewed from Newline Road by the associated wetlands and water bodies (refer **Figure 12**).

Figure 12 Visual Context



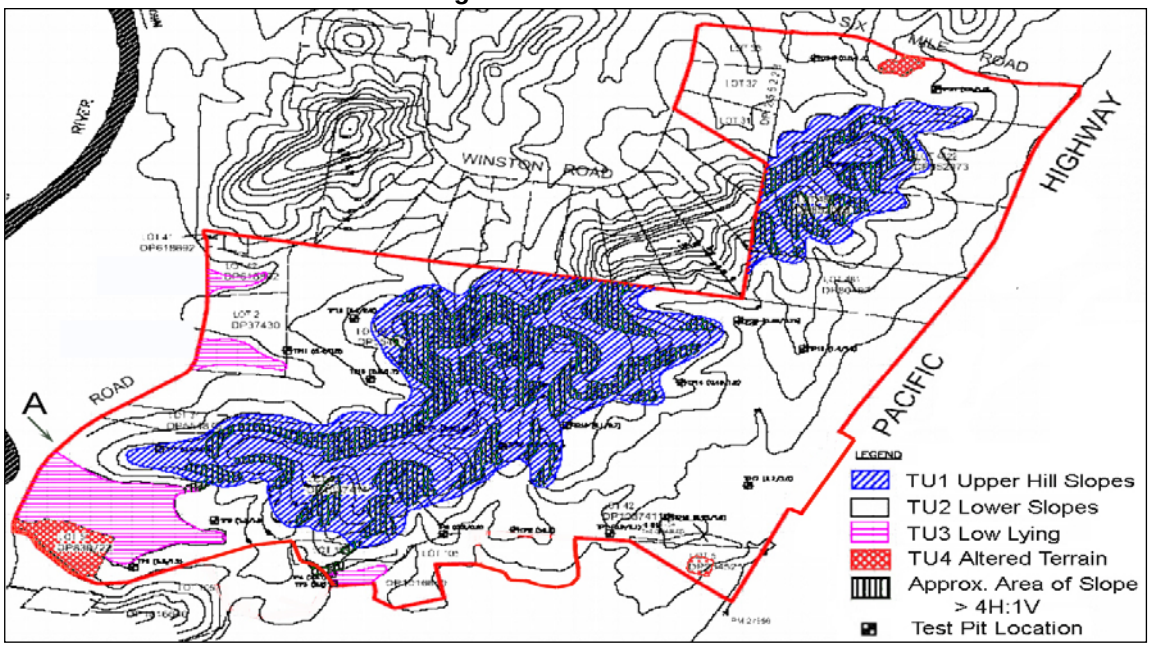
Source: Deicke Richards

2.3.3 Geology

Preliminary geotechnical and contamination investigations were carried out during the rezoning process by Douglas Partners Pty Ltd (see **Attachment J**).

Geotechnical conditions determined by field observations and subsurface investigations informed a 'Terrain Units' map delineating areas of similar site (see **Figure 13**) and described in **Table 1**.

Figure 13 Terrain Units



Source: Douglas Partners

2.3.3.1 Foundation Conditions and Depth to Rock

The subsurface conditions can be broadly divided into two categories:

1. Lower slopes with variable soil depth from 0 m to >2 m depth. Soil composition generally comprising near surface silt/sand overlying clays, overlying a variety of rock types.

2. Upper slopes, spur lines and hill crests with shallow (less than 1 m) to no soil cover. Soils generally sandy and silty overlying predominantly sandstone and conglomerate.

The clay soils across the site were generally observed to be reactive, and further testing would be required to address clay reactivity and to determine site classification for foundation design.

2.3.3.2 Slope Stability

No overt signs of deep seated instability were observed during field investigation. Ongoing slope evolution processes and earthworks during development may nonetheless result in some natural instability in areas comprising slopes in excess of 4H:1V or small dams. Stability issues of this kind would not preclude development and are readily mitigated by specific geotechnical investigation prior to construction design in each stage, where relevant.

Table 1 Terrain Units

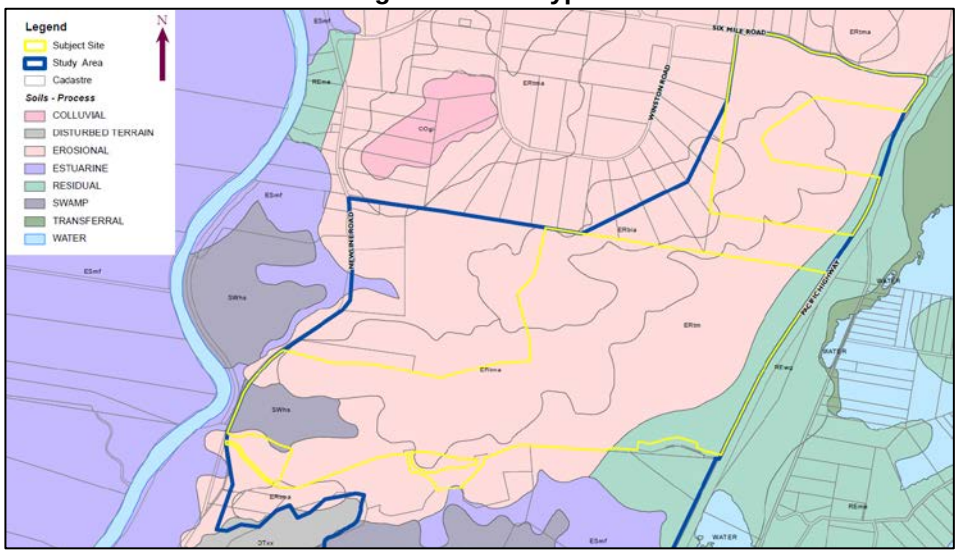
Terrain Unit	Description	Features	Geotechnical Constraints
TU1	Upper hill slopes, gully flanks, hill crests and spur lines (see also 4H:1V slope drawing)	• including steep slopes in excess of 4H:1V • typically shallow rock, <1 m deep • common rock outcrop • includes cliff lines	• potential stability issues associated with loose boulders and cliff lines, impacting on down slope areas, specific stability assessment recommended where slope in excess of 4H:1V • difficult excavation, possible heavy ripping or drill and blast required in some areas • high potential for erosion caused by development
TU2	Lower slopes, base of gullies	• slopes generally less than 4H:1V • variable depth to rock (0 m to >2 m) • variable soil types, predominantly high plasticity clays • gully erosion on some parts of site, where clearing has been undertaken • presence of earth dams in some gullies variable vegetation cover	• potential stability issues associated where upslope boulders could impact on development • difficult excavation in some areas • potential for erosion caused by development • water logging of soils in some areas, particularly gully bases and low elevation • potential reactive soils, site classification required • remediation or removal of dams required
TU3	Low lying areas	• low lying areas and wetlands below about RL 10	• existing wetlands • poorly drained • prone to inundation, 1 in 100 yr flood level at about RL 5 • potential acid sulphate soils below RL 5 • low wet strength, potentially compressible foundation soil conditions • sensitive to upstream development
TU4	Altered terrains	• disturbed soils • quarries • landfill	• stability issues in and around quarries, remediation of quarries may be required • uncontrolled filling • settlement of landfill

Source: Douglas Partners

2.3.3.3 Erosion/Dispersion

The site contains soils with an erosion hazard. These soils are readily amenable to standard mitigation measures to address the potential for soil erosion.

Figure 14 Soil Types



Source: RPS SIS

2.3.3.4 Potential Acid Sulphate Soils

The Karuah and Maitland Acid Sulphate Soil Risk indicate that there is a high probability of acid sulphate soils within 1m of the ground in the western part of Lot 41, DP1037411 (area marked '**A**' in **Figure 12**).

2.3.4 Drainage Catchments and Watercourses

Kings Hill comprises three catchments to be considered in the formulation of storm water management measures (refer **Figure 15**).

Kings Hill East - Grahamstown Dam Catchment

To the north-east part of the study area, the catchment forms part of the water supply catchment leading into the Grahamstown Dam, one of Newcastle's main water supply dams.

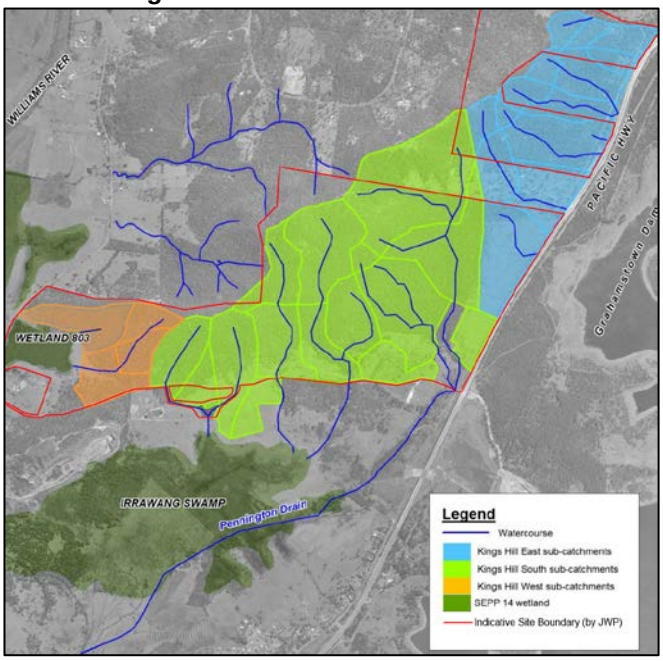
Kings Hill South - Irrawang Swamp Catchment

The southern part of the study area drains toward the Irrawang Swamp, an area largely controlled by Hunter Water as it contains the overland flow path for overflow from the Grahamstown Dam.

Kings Hill West - Williams River Catchment

The north-western portion of the study area generally drains toward the Williams River.

Figure 15 Catchment Boundaries



Source: Adapted by JWP from WBM

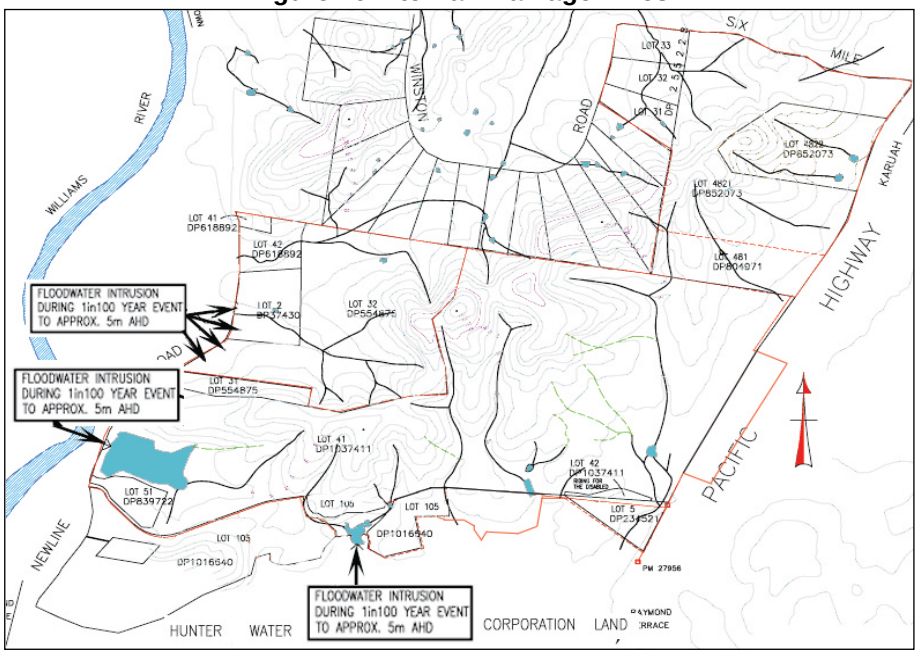
2.3.5 Flooding

Northrop Engineers (acting for KHD) and BMT WBM (acting for PSC) advise that flood events affecting the site can be generated from a number of sources, which are not necessarily independent. Internal creek lines and the relevant flood levels are illustrated in **Figure 16**.

2.3.5.1 Internal Drainage Lines

Internal drainage lines are generally ephemeral (refer **Figure 16**).

Figure 16 Internal Drainage Lines



Source: Northop Engineers

2.3.5.2 Flooding from Grahamstown Dam

Table 2 Flood Levels – Southern Boundary

Event Average Recurrence Interval (ARI)	Predicted Flood Level
1 in 2 year	1.93 m AHD
1 in 5 year	2.26 m AHD
1 in 20 year	2.68 m AHD

2.3.5.3 Flooding from the Williams River

Table 3 Flood Levels – Williams River

Event ARI	Predicted Flood Level
1 in 100 year	5 m AHD (1955 flood)
1 in 200 year	5.2 m AHD
1 in 2000 year	5.7 m AHD

The flood behaviour of the Williams River is documented in the BMT WBM Williams River Flood Study (June 2009), commissioned by PSC.

In 2013, BMT WBM was further commissioned by PSC to prepare *KHURA Water Management Strategy Guidelines* and *Kings Hill Flood Free Access Study*. An extract of the 1% AEP map illustrates the extent of a 1% flood event relative to the site is provided in **Figure 17**.

Figure 17 Flooding in 1% AEP Event

Source: BMT WBM Flood Free Access Study 2013

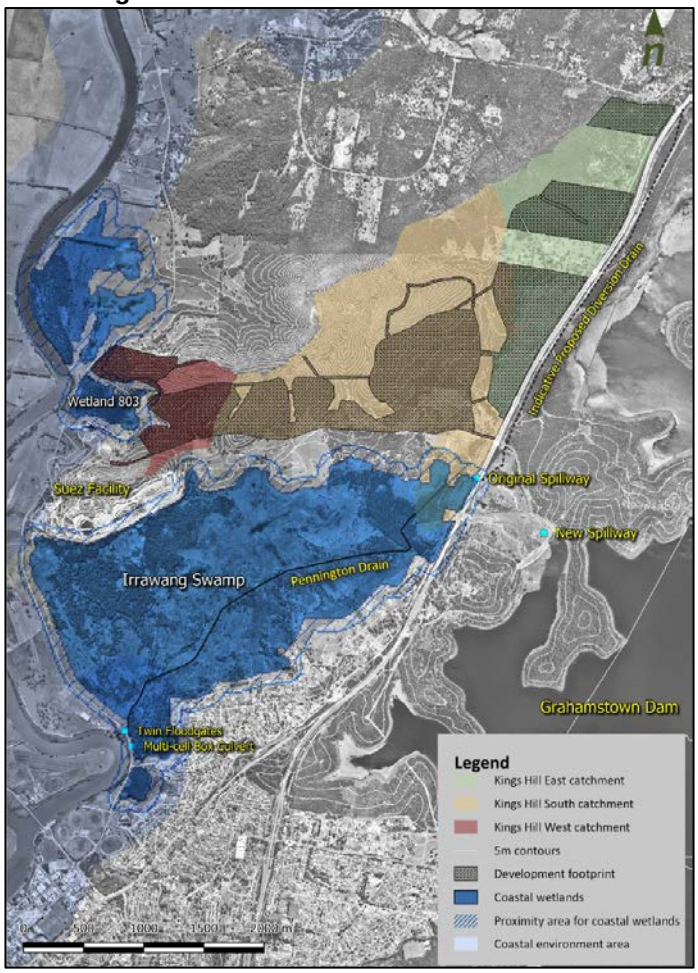
2.3.6 Coastal Wetlands

The site comprises three (3) main catchments that currently drain to separate receiving environments (refer **Figure 15**).

Kings Hill South drains to Irrawang Swamp (Coastal Wetland 804) which is located between Newline Road and the Pacific Highway. Kings Hill West drains to an unnamed wetland (Coastal Wetland 803) located adjacent to Newline Road to the north of Irrawang Swamp. Kings Hill East currently drains to Grahamstown Dam and runoff from this catchment is proposed to be diverted via a stormwater channel running between the Pacific Highway and the Grahamstown Dam discharging to Irrawang Swamp to protect water quality in the dam.

Irrawang Swamp and Coastal Wetland 803 are both mapped coastal wetlands under SEPP (Coastal Management) 2018 (SEPP 2018) (see **Figure 18**).

Figure 18 Downstream Coastal Wetlands



Source: Alluvium December 2019

Each wetland contains a number of species that are susceptible to impacts from altered hydrological regimes, and the dominant risks to the vegetation in the wetlands from hydrological changes include:

- extended periods of increased inundation depth; and
- reductions in seasonal drying patterns.

2.3.6.1 Irrawang Swamp

Surface runoff currently drains into Irrawang Swamp from the surrounding catchment and additional flow is contributed from Grahamstown Dam during periods when the spillway level is exceeded. Surface runoff drains from the forested and pastured upper slopes of Kings Hill in a southerly direction along unnamed ephemeral watercourses into the northern section of Irrawang Swamp. Existing and future residential development in Raymond Terrace drains into the swamp from the south.

2.3.6.2 Wetland 803

The majority of the Kings Hill West catchment drains to Wetland 803 located adjacent to Newline Road. The catchment is primarily forested in the upper reaches with cleared grazing areas observed around the lower reaches and the wetland perimeter. The hydrology of Wetland 803 is influenced by catchment inflows and tidal inflows from the Williams River.

2.3.7 Biodiversity

The Proposal involves land generally disturbed by a history of logging and quarrying, and in more recent times, the land has become disturbed by weed and pest invasion associated with a long history of grazing activities under the former rural zone (which continue today under existing use rights).

For rezoning purposes, ecological and biodiversity assessments were conducted over all the land within the KHURA by Hunter Wetlands Research (HWR) in 2004 for the landowners, and by EcoBiological in 2009 for Port Stephens Council. Site investigations by KHD since the rezoning of the land in 2010, and preparation of an SIS by RPS Group during 2018 and 2019, provide an improved and contemporary understanding of biodiversity values. Collectively, environmental monitoring and assessment of KHDs land has spanned a considerable period of time, being some 16 years of data collected between 2003 and 2019.

2.3.7.1 Threatened Flora

About 20% of the flora on the subject site is exotic, with 377 native flora species and 98 exotic species recorded. Three (3) threatened flora species are known to occur within the subject site as outlined in Table 4, which also provides estimates of the number of individuals from direct counts and habitat area mapping using a 30 m buffer from recorded individuals.

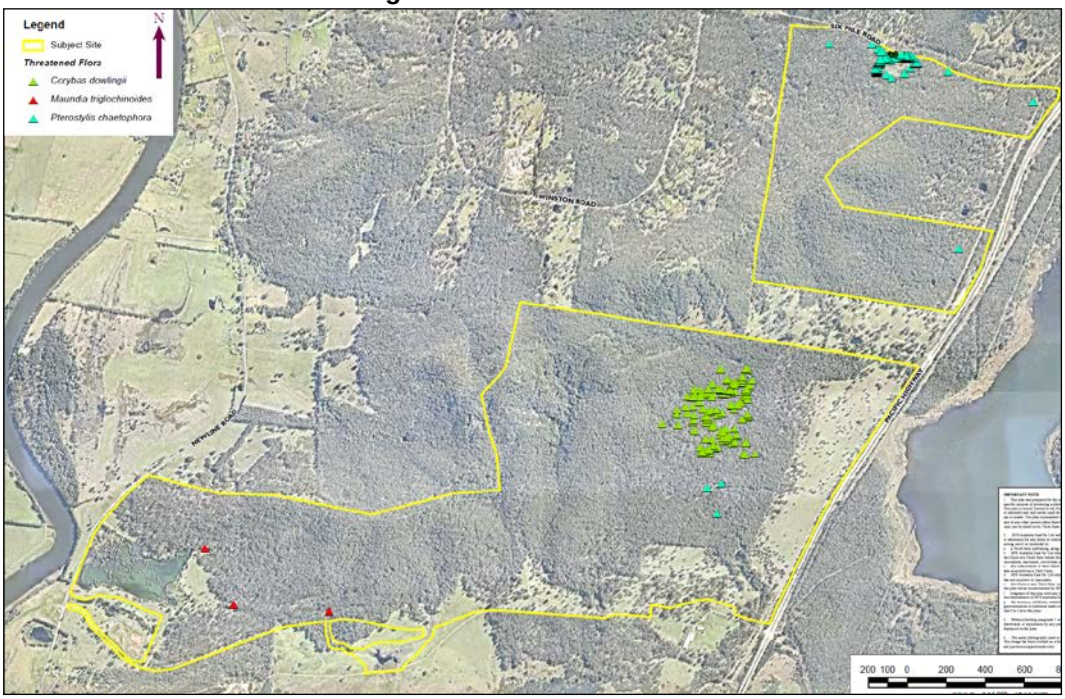
Table 4 Threatened Flora within the Subject Site

Species	TSC Act	Proposal Footprint		Conservation Area	
		Count	Habitat Area (ha)	Count	Habitat Area (ha)
Maundia triglochinoides	Vulnerable	50	0.08	42	0.15
Pterostylis chaetophora	Vulnerable	20	1.41	468	4.36
Corybas dowlingii	Endangered	118	4.66	1,467	8.62

Source: RPS Species Impact Statement

The location of threatened flora recorded within the subject site is shown in **Figure 19.**

Figure 19 Threatened Flora



Source: Adapted from RPS Species Impact Statement

2.3.7.2 Threatened Fauna

Threatened fauna species recorded within the subject site are:

Glossy-black Cockatoo;

Brown Treecreeper;

Varied Sittella;

Little Lorikeet;

White-bellied Sea Eagle;

Grey-crowned Babbler;

Powerful Owl;

Koala;

Brush-tailed Phascogale;

Grey-headed Flying Fox;

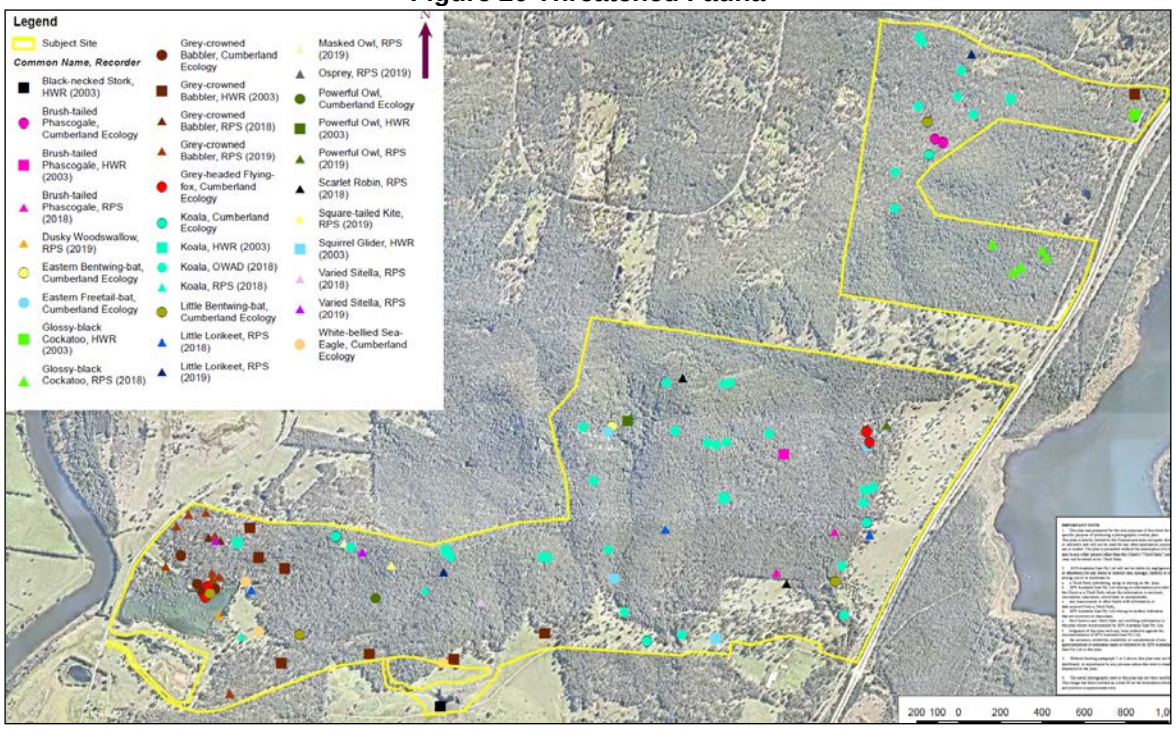
Eastern Bentwing-bat;

Little Bentwing-bat; and

Eastern Freetail-bat

Locations of threatened fauna recorded within the subject site are shown in **Figure 20**.

Figure 20 Threatened Fauna

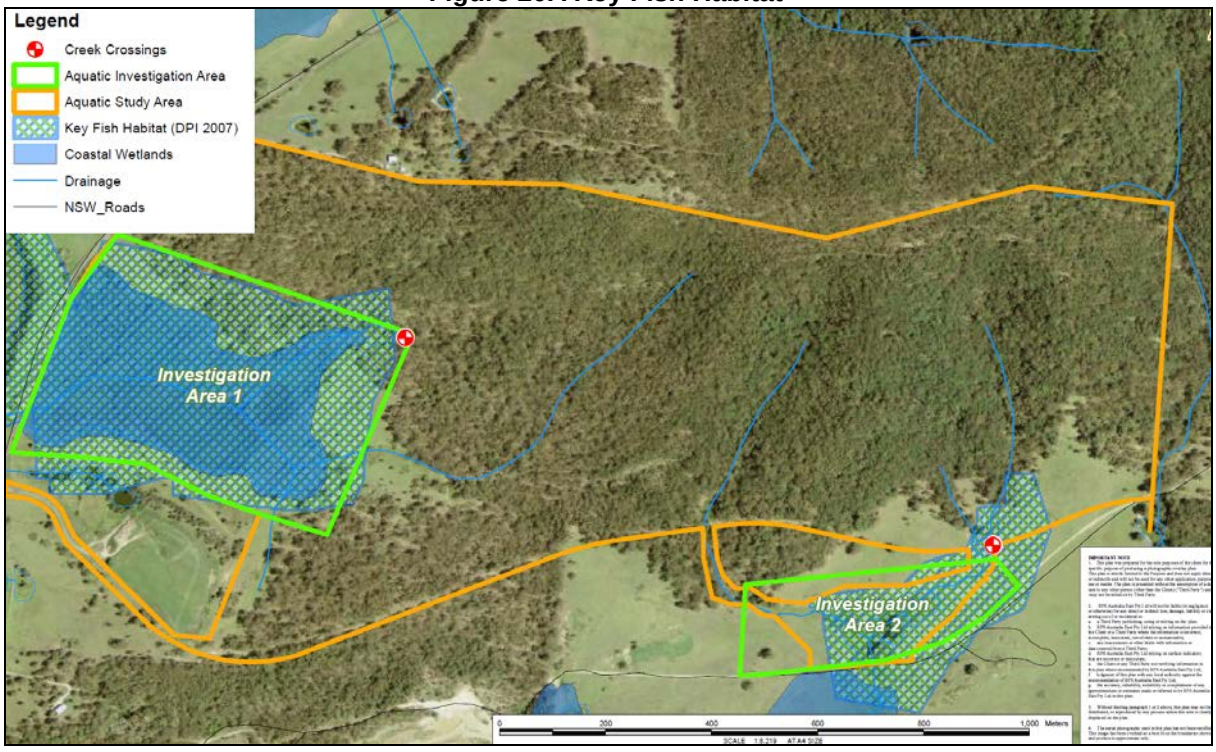


Source: Adapted from RPS Species Impact Statement

2.3.7.3 Key Fish Habitat

In addition to the Key Fish Habitat mapped by NSW DPI within the Williams River and within Irrawang Swamp (both receiving waters), mapped Key Fish Habitat exists on the site is depicted in **Figure 20A**.

Figure 20A Key Fish Habitat



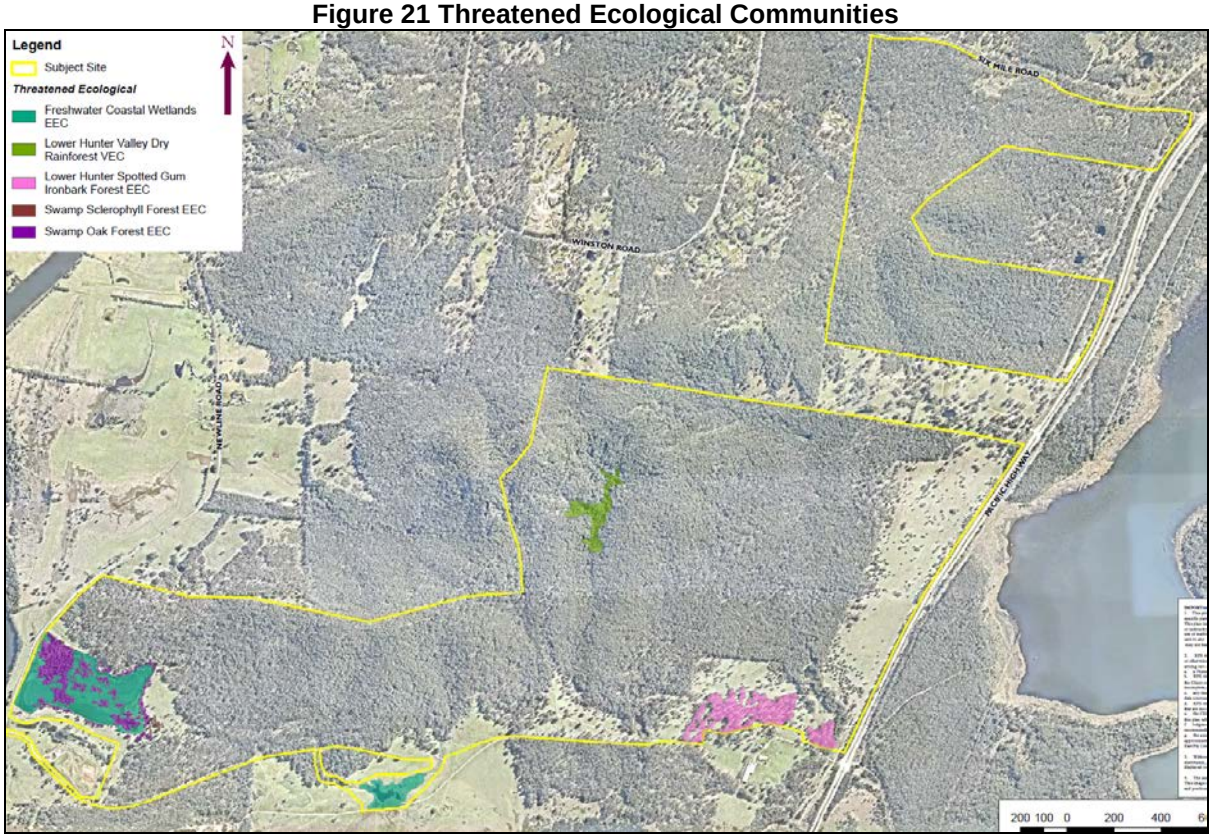
Source: RPS Key Fish Habitat Assessment

2.3.7.4 Threatened Ecological Communities

Vegetation forming part of the following listed threatened ecological communities occurs within the subject site (refer **Figure 21**):

- Freshwater wetlands on coastal floodplains of the NSW North Coast, Sydney Basin and South East Corner Bioregions;
- Lower Hunter Valley Dry Rainforest in the Sydney Basin and NSW North Coast Bioregions VEC;
- Lower Hunter Spotted Gum – Ironbark Forest in the Sydney Basin and NSW North Coast Bioregions EEC (preliminary listing);
- Swamp Sclerophyll Forest on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner Bioregions EEC; and
- Swamp Oak Forest on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner Bioregions.

Figure 21 Threatened Ecological Communities



Source: RPS Species Impact Statement

2.3.7.5 Vegetation Communities

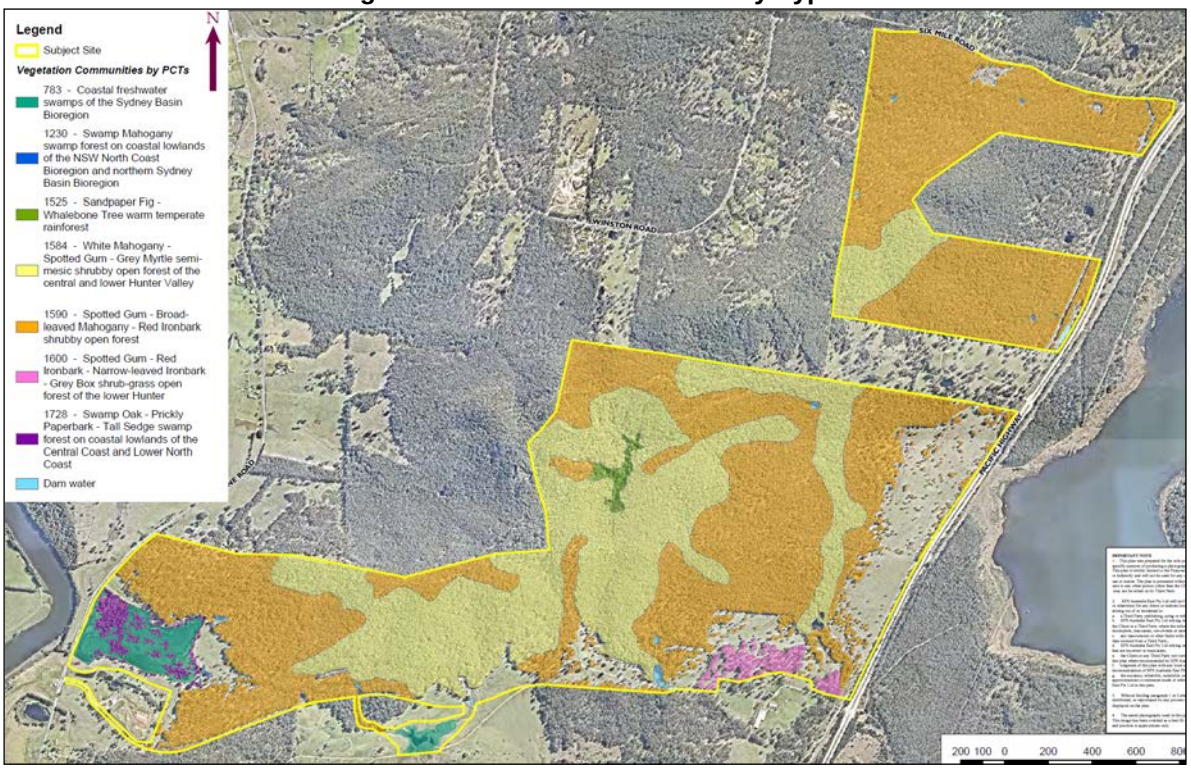
Seven native plant community types (PCTs) are mapped within the site (with minor modifications made for the subject site as recommended by BioLink 2017) (refer **Table 5**).

Table 5 Native Plant Community Type

PCT	TEC	PCT Name	Condition	Subject Site (ha)
783	Yes [13]	Coastal freshwater swamps of the Sydney Basin Bioregion	Medium	11.37[14]
1230	Yes [15]	Swamp Mahogany swamp forest on coastal lowlands of the NSW North Coast Bioregion and northern Sydney Basin Bioregion	Poor	0.15
1525	Yes [16]	Sandpaper Fig - Whalebone Tree warm temperate rainforest	High	2.42
1584	No	White Mahogany - Spotted Gum - Grey Myrtle semi-mesic shrubby open forest of the central and lower Hunter Valley	High	149.45
1590	No	Spotted Gum - Broad-leaved Mahogany - Red Ironbark shrubby open forest	High	262.46
1590	No	Spotted Gum - Broad-leaved Mahogany - Red Ironbark shrubby open forest	Medium	2.15
1590	No	Spotted Gum - Broad-leaved Mahogany - Red Ironbark shrubby open forest	Poor	5.89
1600	Pre [17]	Spotted Gum - Narrow-leaved Ironbark shrub - grass open forest of the central and lower Hunter	Medium	6.21
1728	Yes [18]	Swamp Oak - Prickly Paperbark - Tall Sedge swamp forest on coastal lowlands of the Central Coast and Lower North Coast	Medium	5.49
TOTAL				**445.59**

Source: RPS Species Impact Statement

Figure 22 Native Plant Community Types

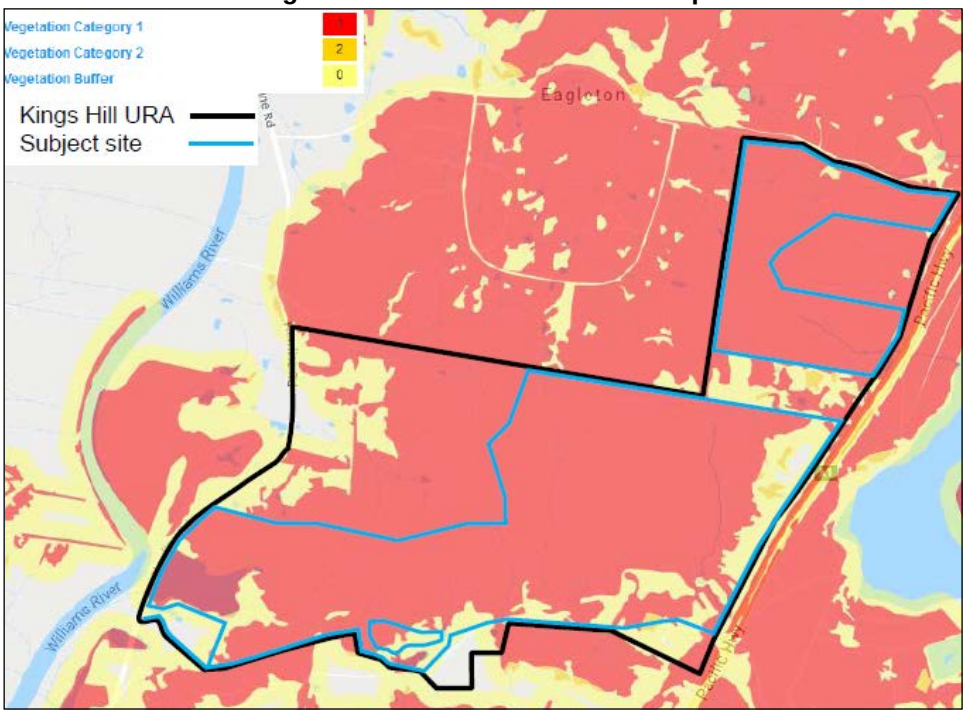


Source: RPS Species Impact Statement

2.3.8 Bushfire Prone Land

The subject sites are mapped as bushfire prone land and therefore the application of Planning for Bush Fire Protection is relevant to the development proposal (refer **Figure 22**).

Figure 23 Bushfire Prone Land Map



Source: Australian Bushfire Consulting Services based on PSC BFPL Map

2.3.9 Aboriginal Archaeology

Myall Coast Archaeological investigated the land during the rezoning process in consultation with the Worimi Local Aboriginal Land Council (**Appendix J**).

No artefactual evidence was found on the site along the drainage lines, trails exposed areas or during the geotechnical analysis. Nonetheless, Kings Hill, its associated ridgeline and the wetlands are of significance (refer **Figure 25**). In particular:

<u>Caves and Shelters</u>
Series of rock shelters, caves and rock outcrops are located along the entire ridgeline.

Lookout and telecommunications

The several high points along the ridgeline would have been the high places used for signal places through fires and smoke.

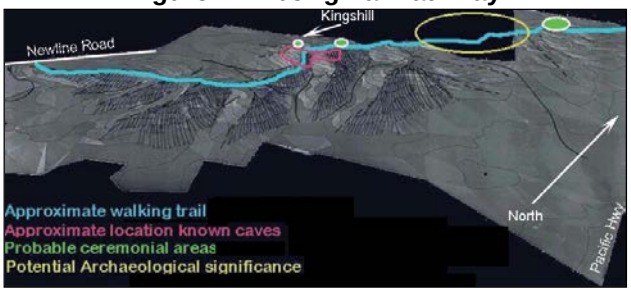
Ceremonial grounds

The topography and landform of Kings hill and the next hill to the north indicate ceremonial grounds such as bora grounds and male ritual.

Aboriginal pathway

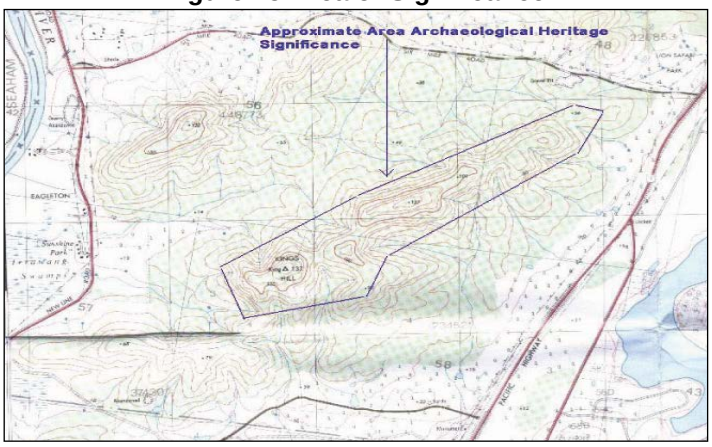
Historical information and anecdotal evidence suggests that the ridgeline was used by early Europeans as a bridal trail and a roadway during floods. This tends to strongly indicate the ridge top was a transport corridor from the Williams River to Karuah, Port Stephens and the Tilligery and Tomaree Peninsulas (refer **Figure 24**).

Figure 24 Aboriginal Pathway



Source: Myall Coast Archaeology

Figure 25 Area of Significance



Source: Myall Coast Archaeology

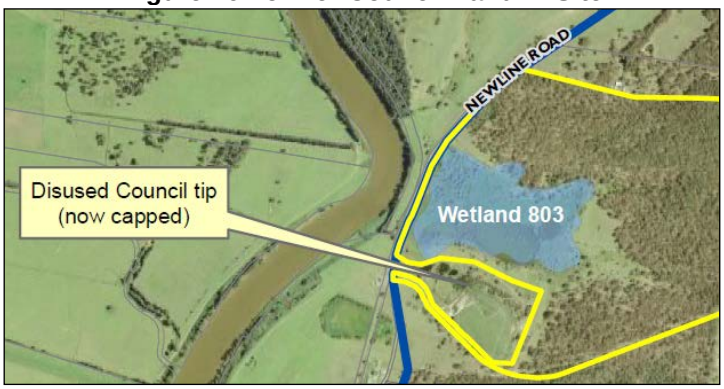
The establishment of the nearby Grahamstown Dam has severely disturbed the landscape to such an extent that the full significance of the ridgeline to the total picture cannot be fully appreciated or assessed.

2.3.10 Potential Contamination

A review of site history and observation during site investigations suggest that the site is generally unlikely to contain gross environmental impact associated with the current and former site activities. The principal sources of potential contamination relevant to the site are nonetheless noted as:

- Former Port Stephens Council landfill site off Newline Road (see **Figure 26**) - possible migration implications due to its proximity to the wetland, with capping of the landfill only recently implemented by Council.

Figure 26 Former Council Landfill Site



Source: RPS Species Impact Statement

- Localised dumping/stockpiles – may contain a range of potential contaminants, including metals, hydrocarbons etc.
- Former quarry (northern site area off Six Mile Road) – may contain localised heavy metal, hydrocarbon impact from former quarry equipment and machinery.

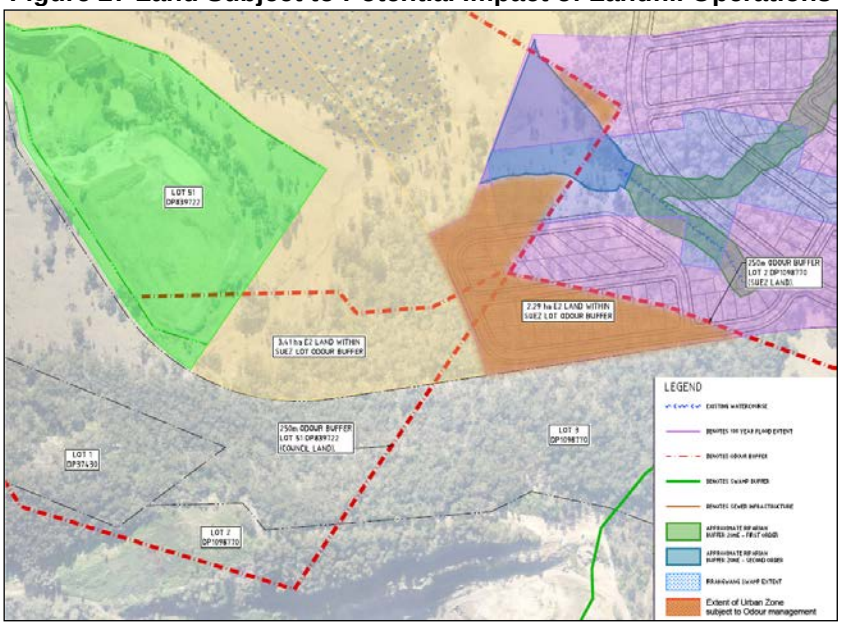
2.3.11 Air Quality

Recent discussion with Council in respect of the now capped landfill has indicated a requirement to monitor gas release levels associated with the former prior to any application to carry-out subdivision within 250m of the site.

Additionally, a submission by the operators of the current waste resource and landfill centre south of the site off Newline Road (Suez Pty Ltd) has sought consideration in any application to carry out subdivision within 250 of the site's boundary with their operations.

The extent of the site subject to these considerations under a future application to subdivide the land is mapped in **Figure 27**.

Figure 27 Land Subject to Potential Impact of Landfill Operations

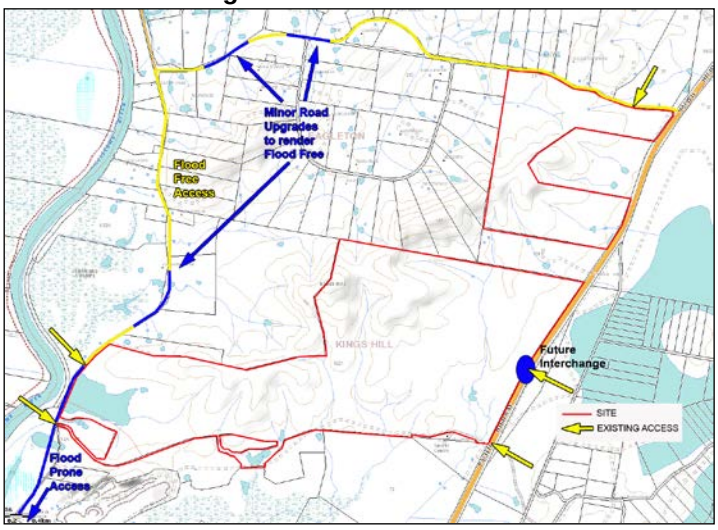


Source: JWP based on Northrop Engineers

2.3.12 Road Access

The site is accessed via existing points off Newline Road, Six Mile Road and the Pacific Highway, although access via Newline Road is severed during only moderate flood events (see **Figure 28**).

Figure 28 Vehicle Access



Source: JWP based on Six Maps

Transport for NSW will not permit any intensification of land use that would rely on direct access to the Pacific Highway on safety and network efficiency grounds. With Newline Road cut by flood event by sometimes days at a time, upgrades are required to Newline Road to enable flood free access until a grade separated interchange is constructed to enable direct access to the Pacific Highway. With minor upgrades in the locations shown in **Figure 28** and prior to the completion of the interchange access would be from the north along Newline Road, linked to Pacific Highway via Six Mile Road.

The Six Mile Road intersection with the Pacific Highway has been determined by TfNSW to have safe capacity for the level of traffic generated by up to 400 lots within KHURA. Each existing lot within the KHURA with access via Newline Road will be permitted (subject to entering arrangements with the NSW State government to contribute to the funding of the interchange) a pro-rata proportion of 400 lots before an interchange is operational.

2.3.13 Acoustic Environment

2.3.13.1 Road Traffic Noise

Long-term attended noise monitoring was completed by EMM Pty Ltd along the entire URA frontage to the Pacific Highway to establish existing ambient noise levels and road traffic noise exposure across the subject site (see **Attachment O**).

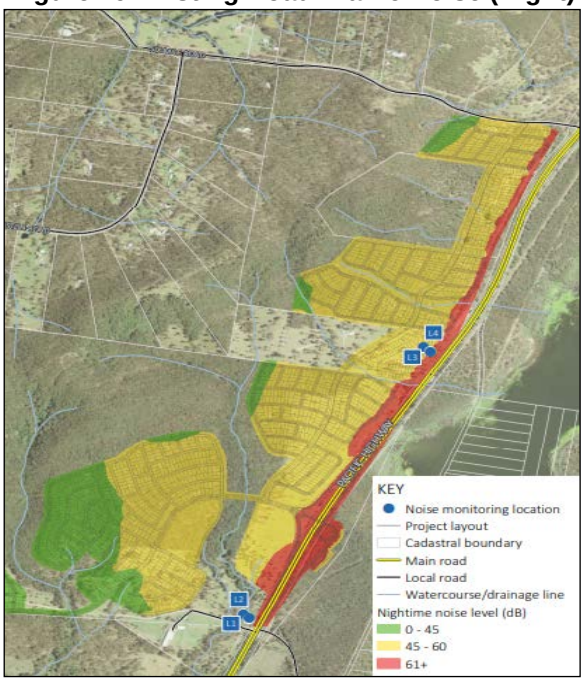
Measured noise levels were assessed with reference to Clause 102 of the infrastructure SEPP (2007) and DPIE's "*Development near Rail Corridors and Busy Roads – Interim Guidelines"* (2008). Road traffic noise levels were predicted across the site at hypothetical single story dwellings.

The results of noise modelling indicate that the relevant requirements regarding road traffic noise intrusion will be achieved for the large majority of hypothetical dwellings by adopting standard, complying development construction techniques and including an alternate means of ventilation as per the DPIE's "*Development near Rail Corridors and Busy Roads – Interim Guidelines"* (2008).

For a small number of hypothetical residences fronting the Pacific Highway, the 60 dB noise contour marginally encroaches into their respective allotments, which requires consideration of dwelling siting, floor plan and construction type to ensure that category two construction can satisfy the relevant internal noise goals at these locations.

Figure 29 illustrates the *existing* night time road traffic noise levels along the Pacific Highway frontage, without screening. The effect of implementing a noise barrier is discussed in **Section 4.10**.

Figure 29 Existing Road Traffic Noise (Night)

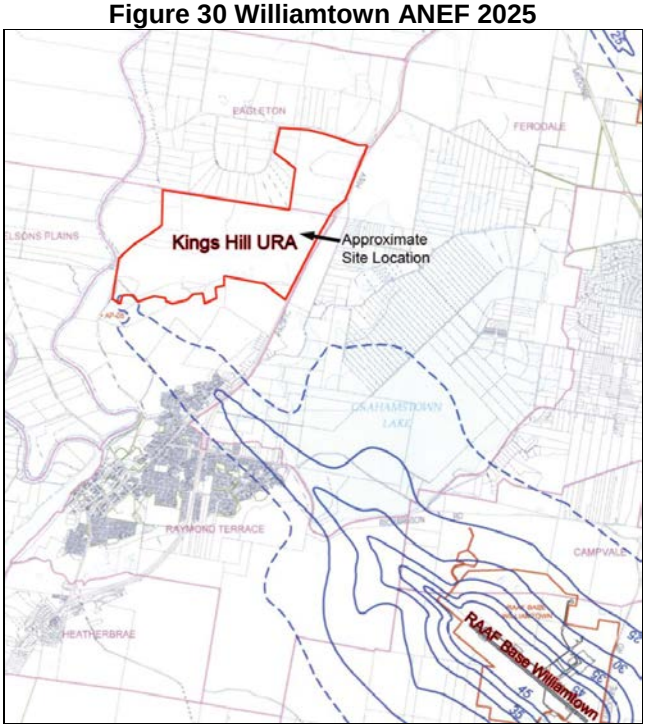


Source: EMM Pty Ltd

2.3.13.2 Aircraft Noise

Although military and civilian passenger aircraft are commonly seen on approach or departure from Williamtown RAAF based/Newcastle airport, the KHURA is not mapped as being within the Australian Noise Exposure Forecast 2025 (ANEF) associated with the airbase (see **Figure 30**).

Figure 30 Williamtown ANEF 2025



Source: Port Stephens Council

2.3.14 Utilities and Infrastructure

2.3.14.1 Sewer and Water

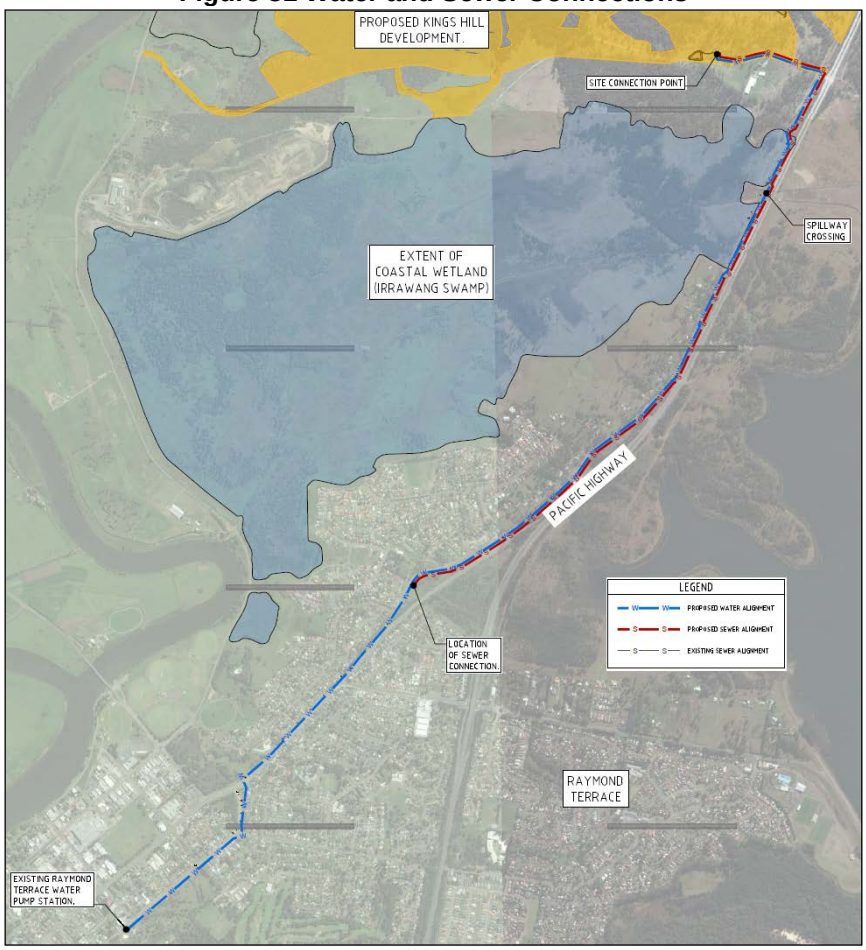
Existing Raymond Terrace sewer and water networks are operating near capacity, and connection points for the URA are the Tomago Water Treatment Works (WTW) and the Raymond Terrace Waste Water Treatment Works (WWTW).

Hunter Water Corporation has endorsed a servicing strategy which involves new lead-in mains to the site via the Pacific Highway, and a separate DA with an Environmental Impact Statement is lodged with Council in respect of those works (see proposed alignment in **Figure 31**).

To service all land within the KHURA in a manner that ensures security of supply, and to ensure pressure for both domestic supply and fire-flow, two (2) x 5ML Water Reservoirs are proposed to be located in elevated areas of the site:

- A low level reservoir servicing areas below 35m AHD; and
- A high level reservoir, servicing areas above 35mAHD but below 60m AHD.

Figure 31 Water and Sewer Connections



Source: Northrop Engineers based on Arcadis EIS

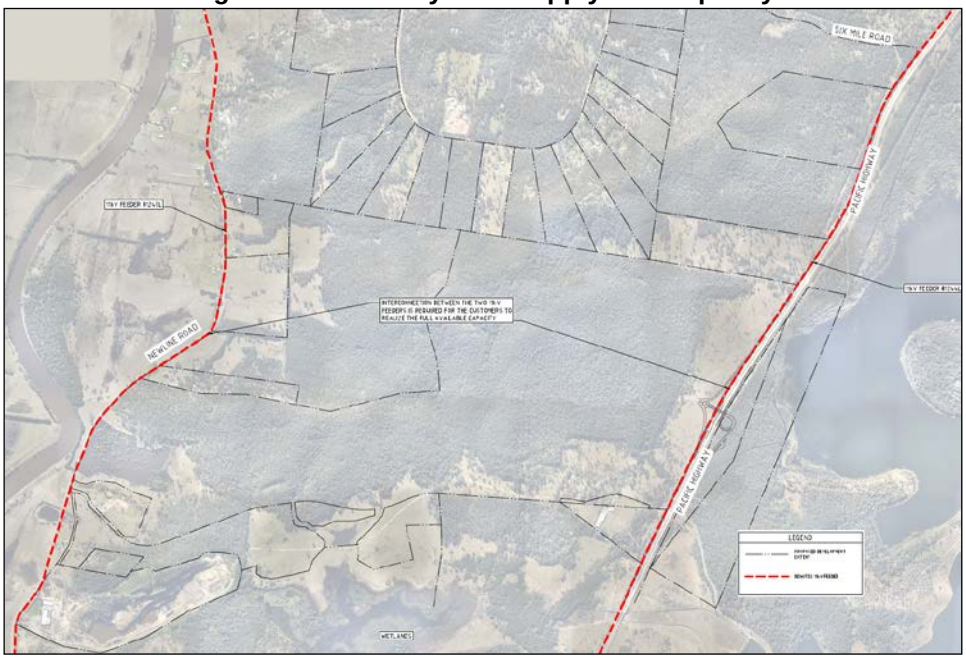
2.3.14.2 Electricity

The site is located within the Ausgrid supply network. Existing supply is in the form of 11KV transmission lines along Newline Road and the Pacific Highway (see **Figure 32**). Ausgrid confirm in a letter dated August 2019 that:

- The total load requirement for 1900 lots is 7.7MVA or 400A at 11kV including capacity for 2 potential schools, staged over 12 years.
- The entire Kings Hill development (3500 lots) is expected to have a total demand of 13.5MVA or 650A at 11kV.
- the area is presently supplied by Raymond Terrace 11kV feeders 81240L and 81244L. Brandy Hill 11kV feeder 82578 is to the north of the proposed development.
- there is currently sufficient capacity on these feeders for the supply of approximately 2 – 3MVA to the general area including surrounding developments.
- there is presently sufficient spare capacity for approximately 0.5 – 1MVA or 200 lots on both sides of the Kings Hill development area.
- there is available capacity for approximately 600 - 800 residential lots in the area including adjacent developments, subject to the new load being divided across feeders with appropriate interconnections through the new development (from the Pacific Highway to Newline Rd). The staging will have an impact on how many lots can be connected without network augmentation.

- Network augmentation will be required to supply the ultimate Kings Hill development area.
- There are several options for the network augmentation however it is likely that one or more new 11kV feeders will be required from Raymond Terrace Zone Substation. Associated interconnection works between feeders in the area will also be required.

Figure 32 Electricity Grid Supply and Capacity



Source: Northrop Engineers based on Ausgrid advise

2.3.14.3 Gas Supply

Jemena is responsible for managing the gas distribution network in this area, and Jemena advise the nearest connection point is in Raymond Terrace. Upon approval, application can be made to Jemena to assess the load and connection options.

2.3.14.4 Communications

Optic Fibre runs along the Pacific Highway frontage of the site, and approvals are in place to relocate the asset clear of future subdivision and interchange delivery works.

KHD has also worked with Telstra and the NBN to ensure capacity and access via a local node during the NBN network rollout. This is to ensure communication, social and employment opportunities are in line with metropolitan areas, for example, working from home.

2.4 Framework for Development and Conservation

The land was rezoned in 2010 to a mix of urban and conservation zones based on some 8 years of site and environmental assessments of the kind outlined in the Site Analysis under **Section 2.3**. But while the gazetted land-use zones provide an indication of areas capable of development and suitable for conservation, it is ultimately the statutory, strategic and environmental considerations during the Development Application preparations that shape the use of the land.

In terms of the conservation zones, a review of the proposed zoning in 2009 by EcoBiological (2009) identified four (4) key environmental outcomes that future Development Applications ought to achieve within the KHURA:

- Establish corridor zones of 100-150 m width (proposed corridor widths meet and exceed this specification). At least three corridors are proposed as recommended and are to be enhanced (enriched) with Koala-friendly vegetation;
- Retain additional preferred Koala habitat along the western ridge;
- Avoid as far as possible areas of high-value Brush-tailed Phascogale habitat and known Grey-crowned Babbler breeding areas; and
- Avoid the removal of Freshwater Wetland habitat within three key wetland locations.

Ecobiological also identified areas within the KHURA where land uses within an urban zone could potentially result in a significant impact on the certain threatened species or their habitat.

To inform and respond to Ecobiological's recommendations, and to inform the Development Application process as to whether a significant impact is likely, the Chief Executive Requirements (CERs) for the preparation of a Species Impact Statement (SIS) were obtained from the NSW Office of Environment and Heritage in 2017, and updated in 2018.

Preparation of an SIS by RPS Group during 2018 and 2020 has provided an improved and contemporary understanding of biodiversity values and potential impacts arising from the gazetted land use zones. In particular, the CERs required that the SIS adopt the biodiversity principle of '***avoid, minimise and mitigate'***.

This is a principle that did not formally exist in 2010 when the land was rezoned, and adopting this principle in the SIS provided a means to re-evaluate the site and refine the approach to development and conservation with a view to not causing a significant impact, and to ensure conservation outcomes that align with those recommended by Ecobiological.

A key objective of the SIS was therefore to determine how the Proposal can deliver the zone based land use expectations of the KHURA without having a significant impact on threatened species and ecological communities on the site. In turn, extensive site investigations were carried out in accordance with the CERs to determine how the principle of avoid, minimise and mitigate ought to be adopted by the Proposal to achieve that objective.

The recommendations of the SIS are that to avoid a significant impact on threatened species and ecological communities on the site, the Proposal ought to adopt the following principles, notwithstanding the existing land use zones gazetted in 2010:

1. Define an area suitable for the long term sustainable conservation of local biodiversity values (a conservation area) and apply the necessary establishment works required to retain these values over the long term (see **Section 3.2.1**);
2. Define an appropriate management regime that minimises the impact of the proposal where the clearing of vegetation and habitat is involved (see **Section 3.2.2**); and
3. Provide security for the long term protection of local biodiversity values through the use of an appropriate conservation mechanism that provides in-perpetuity conservation inclusive of ongoing funded management regimes (i.e. VPA) (see **Section 3.2.1.6.2**)

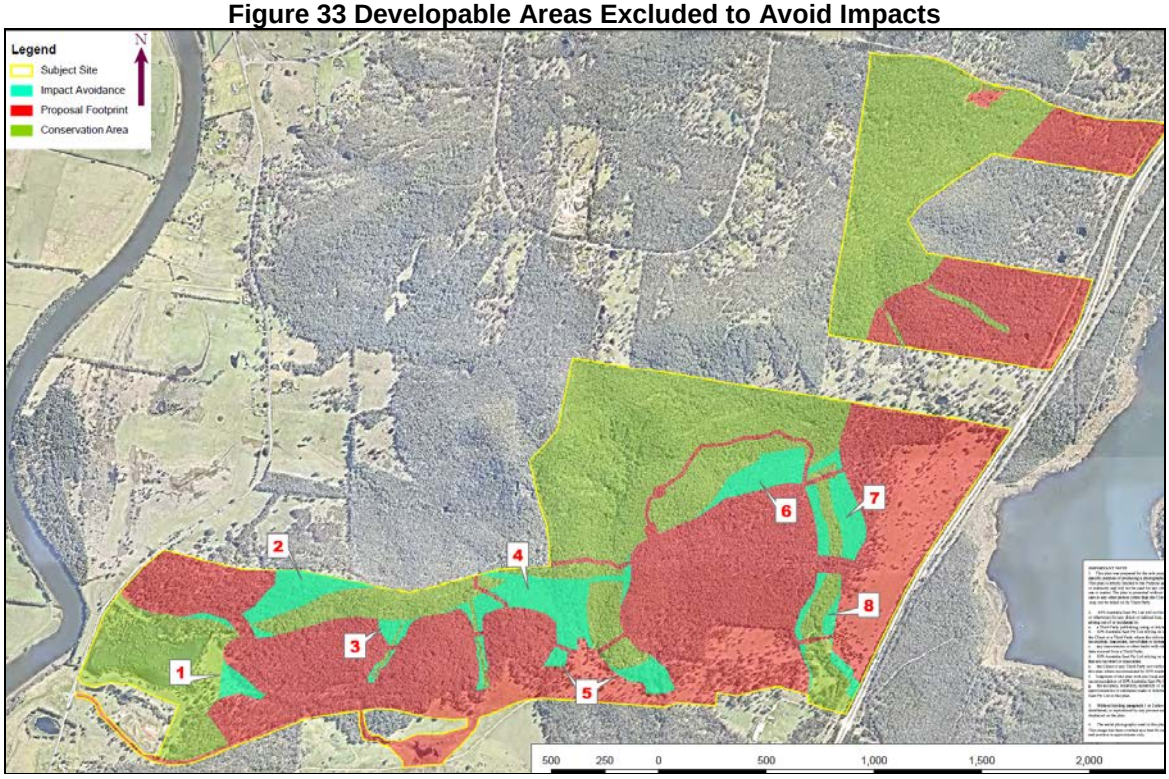
In seeking to define an area suitable for the conservation of local biodiversity values (SIS Principle No.1), the SIS considered key principles relevant to defining an appropriate long term sustainable Conservation Area. They are:

- Patch size and integrity: Larger patches with proportionally reduced edge length enhances the prospect of improved biodiversity outcomes by catering for species with larger home ranges, minimising risk of impact from external threatening processes and reduced influence from edge effects.
- Habitat condition and value: Preferential incorporation of areas with higher biodiversity value (e.g. areas of relatively high hollow-bearing tree and fallen log density and Preferred Koala Feed Trees (PKFTs)) to minimise impacts at the landscape scale, thereby allowing for ongoing local persistence of threatened species.
- Movement pathways: Local and regional movement pathways or corridors have been considered together with zone boundaries and the Proposal, suitable for activities such as revegetation works (e.g. plantings around wetland 803) for the purposes of improving the functioning of retained habitat.

In applying these principles, the SIS confirmed the observations of Ecobiological (2009) that much of the existing E2 zoned land comprised areas of high value habitat conducive to, or in need of, improvements to ensure a long term, resilient, and long term sustainable habitat. In addition, however, the SIS identifies that some 38.5ha (about 12.9%) of the urban zoned land within the subject site exhibits values that are worthy of inclusion and management in a Conservation Area.

Adopting this ***impact avoidance measure*** reduces the developable area of the site from 311.4ha to 272.88ha (refer to areas of urban zoned land to be managed in a proposed Conservation Area in **Figure 33**, with the rationale for each numbered area summarised in **Table 6**), increasing the proportion of the site to be managed for Conservation purposes from 39.8% to 47.2%.

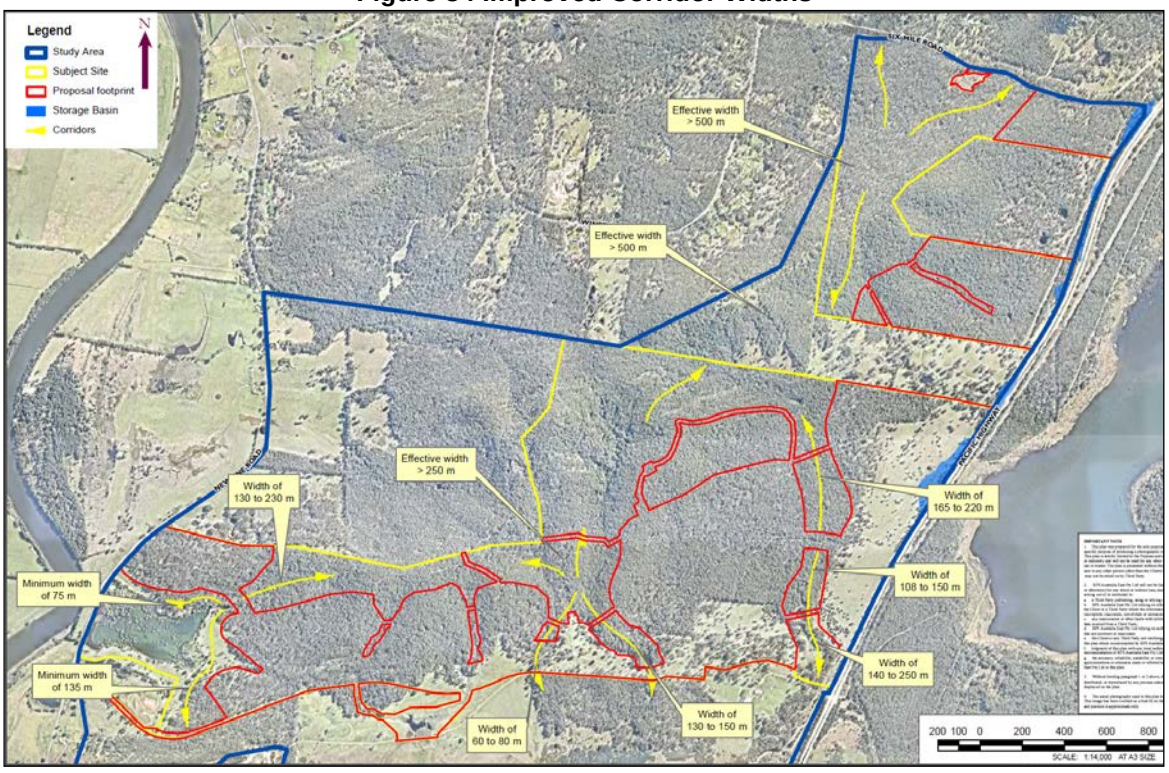
Figure 33 Developable Areas Excluded to Avoid Impacts



Source: RPS Species Impact Statement

The impact avoidance measure increases the area of land to be retained within a Conservation Area to 244.5 ha, and importantly, enables compliance with the Ecobiolgical (2009) recommendation to increase corridor widths (see **Figure 34**).

Figure 34 Improved Corridor Widths



Source: RPS Species Impact Statement

The areas of impact avoidance with the rationale for avoidance are provided in **Table 6:**

Table 6 Impact Avoidance Areas and Rationale

Impact Avoidance	Rationale	Area Avoided (ha)
1	Substantially increase patch integrity by limiting edge to area ratio (i.e. reduce edge effects)	2.23
2	Avoid area with high foliage nutrient value for the Koala Avoid area with high hollow-bearing tree density Increase vegetated corridor width to wetland area	6.18
3	Avoid area with high foliage nutrient value for the Koala and area actively used by the Koala	1.31
4	Avoid area with high foliage nutrient value for the Koala and area actively used by the Koala including breeding female activity Substantially increase patch integrity by limiting edge to area ratio (i.e. reduce edge effects) Increase vegetated corridor width to vegetation situated south of the study area	11.40
5	Avoid area with high foliage nutrient value for the Koala and area actively used by the Koala	3.16
6	Avoid area with high foliage nutrient value for the Koala and area actively used by the Koala including breeding female activity Substantially increase patch integrity by limiting edge to area ratio (i.e. reduce edge effects) Avoid area with high hollow-bearing tree density Avoid the majority of habitat occupied by *Corybas × dowlingii*	5.36
7	Avoid area with high foliage nutrient value for the Koala and area actively used by the Koala including breeding female activity Substantially increase patch integrity by limiting edge to area ratio (i.e. reduce edge effects). Avoid area with high hollow-bearing tree density	6.11
8	Increase vegetated corridor width to vegetation situated south of the study area	2.72
Total		**38.47**

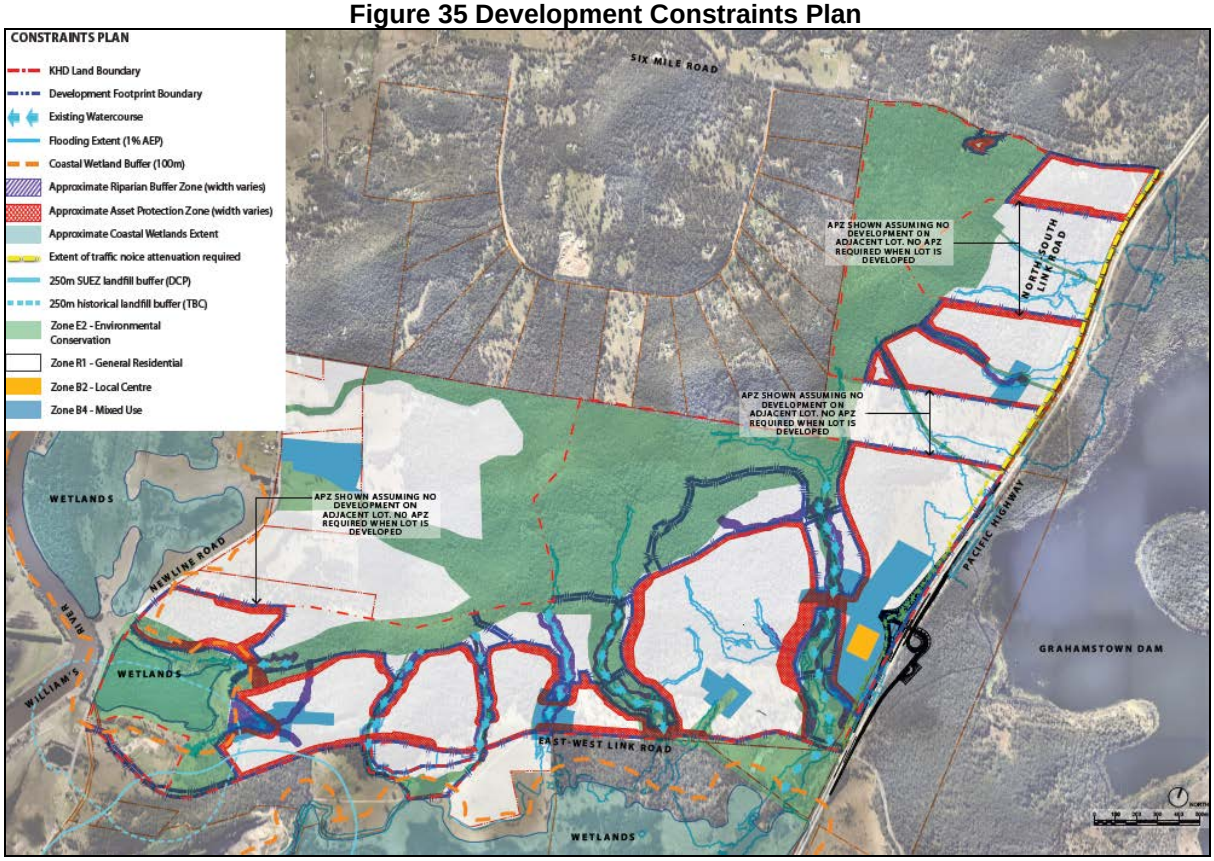
Source: RPS Species Impact Statement

Adopting the impact avoidance measure redefines the boundaries between the urban and conservation areas of the site, which can broadly be described as:

- The 'Conservation Area': This delineates an area for the managed conservation and protection of affected biodiversity values. It comprises 244.25 ha of land, including 38.5ha of urban zoned land which contain high biodiversity values; and
- The 'Impact Area': This delineates areas where impact avoidance is not necessary to avoid a significant impact, and involves land the subject of Stage 1 Subdivision Works (Initial Site Preparation Works) which is 272.88 ha in area comprising 212.14 ha of native vegetation and 60.74 ha of cleared lands.

A Constraints Plan derived from the Site Analysis and incorporating the impact avoidance areas and improved corridor widths recommended by the SIS is depicted in **Figure 35**.

Figure 35 Development Constraints Plan



Source: PDS based on Northrop Engineers

Provided the Constraints Plan remains the basis of the Concept Proposal, development carried out in accordance with the Concept Proposal will be in a position to positively respond to a wide range of statutory, strategic, and environmental planning considerations.

Once approved, the Concept Proposal will provide confidence and certainty in the assessment of subsequent Development Applications to carry out subdivision of the land.

3.0 THE PROPOSAL

3.1 Rationale for Description of the Proposal

The Constraints Plan derived from the Site Analysis in **Section 2.4** (see **Figure 35**) provides a basis for urban land use to be compatible with the site and its terrain, and the conservation objectives for the site.

Equally, it provides a framework for efficient internal road alignments, urban precincts with character and a sense of place, and a subdivision layout comprising a mix of lot sizes and densities commensurate with site attributes.

To ensure the conservation objectives are ultimately realised, however, and not compromised by urban development within the site, the measures recommended by the SIS have been incorporated into the description of the Proposal:

Concept Proposal for Residential Subdivision &
Stage 1 Subdivision Works (Initial Site Preparation Works) &
Establishment of in-perpetuity Conservation Area.

This description ought to ensure that the recommendations of the SIS are implemented in the manner intended, given section 4.24(2) of the Environmental Planning and Assessment Act 1979 states:

> *4.24 (2) While any consent granted on the determination of a concept development application for a site remains in force, the determination of any further development application in respect of the site cannot be inconsistent with the consent for the concept proposals for the development of the site.*

Importantly, consent is sought for implementation of site preparation works as Stage 1 of the Proposal, consistent with the SIS recommendations. This is to ensure adequate time for the recommended measures to be established in advance of the impacts associated with subdivision construction.

The recommendations of the SIS that define the Proposal in terms of land use and conservation areas are detailed in **Section 3.2.1** and **Section 3.2.2**, and graphically represented in terms of timing and sequence in **Section 3.2.3**.

3.2 Stage 1 Subdivision Works – Initial Site Preparation Works

The SIS recommends that the site be prepared in a manner that will enhance and protect areas of high quality habitat, enabling the environment and affected species to transition away from or adjust to the impacts associated with disturbing and clearing lower quality habitat areas of the site to enable urban development.

The Proposal therefore involves the delivery of restoration, mitigation and conservation works designed to attain localised ecological benefit for affected threatened species and ecological communities within the proposed ***Conservation Area***, while gradually preparing the ***Impact Area*** through a program of sequenced and managed habitat loss over an 8+ year timeframe to enable species transition to the adjacent Conservation Area where desirable.

To enable this approach, the SIS recommends that the Proposal adopt the following interrelated measures:

- **Impact Mitigation** measures, including habitat retention, restoration and protection within the proposed ***Conservation Area*** in accordance with a Biodiversity Management Plan (BMP) (see **Section 3.2.1 and Attachment G)**); and
- **Impact Minimisation** through progressive implementation in the proposed ***Impact Area*** over three (3) sequential Phases, a three (3) step vegetation clearing procedure, carried out over an 8+ year time frame allowing time to monitor and minimise impacts on affected threatened biodiversity, regulated in accordance with a Vegetation Management Plan (VMP) (see **Section 3.2.2 and Attachment N**).

The timeframes and sequence required to carry-out the site preparation works recommended by the SIS are shown in **Table 7**. Put simply, Phase 0 focuses on the establishment of the proposed **Conservation Area**, while Phases 1, 2 and 3 involve the progressive preparation of the proposed **Impact Areas**.

Table 7 Site Preparation – Sequence and Phasing

Phase	Objective	Notional Timeframe (years)	Land Area (ha)	Non-vegetated land (ha)	Native Vegetation Cover (ha)	
					Retained	Removed
0	Implement mitigation measures to generate ecological benefit within the Conservation Area prior to phase 1-3 impacts	-2 to 1	244.25[1]	13.06[2]	231.19 12.38[3]	-
1	Focused site preparation works on relatively low biodiversity value (i.e. cleared to partially cleared lands, vegetation with low condition)	1 to 3	131.97	56.09	6.63[4]	75.88
2	Progressive site preparation works occurring within areas of increasing biodiversity value	3 to 8	52.09	3.38	-	48.71
3	Finalisation of site preparation works within areas of higher biodiversity value	8 +	88.85	1.30	-	87.55

[1] Incorporates E2 lands , impact avoidance areas, cleared lands and areas of water

[2] Treeless cleared lands (12.38 ha) that are subject to revegetation works and farms dams (0.68 ha), which are to be retained

[3] Represents area of revegetation works of non-vegetated lands contained within the Conservation Area

[4] Revegetation of detention basins within Proposal footprint

Source: RPS Species Impact Statement

Site preparation works managed under the BMP are to commence in accordance with **Table 7** in advance of introducing impacts associated with disturbing and gradually clearing the Impact Areas in Phases 1, 2, and 3 under the VMP (presented in **Section 3.2.2**, **Figure 47**, and **Table 11**).

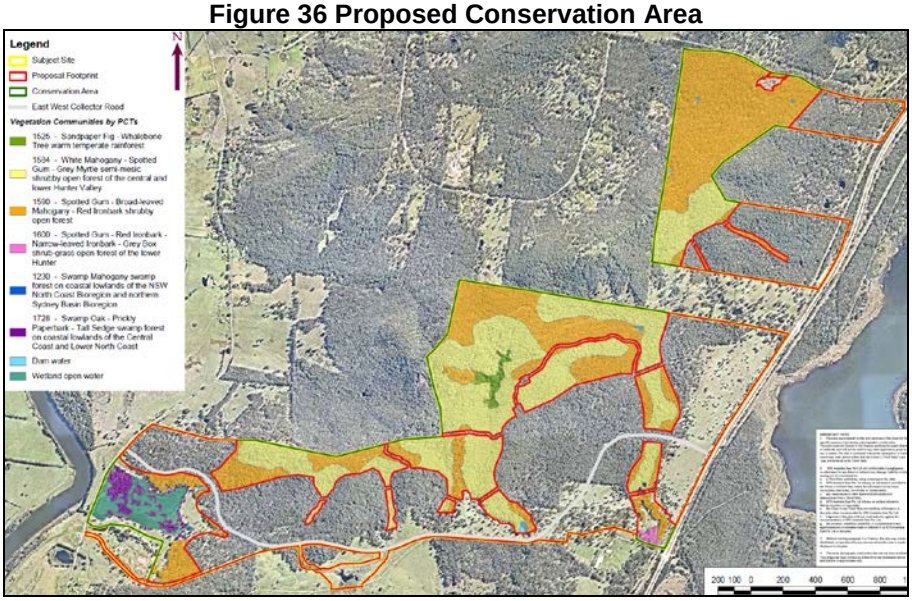
Development within the Impact Area can begin to be carried out (subject to development consent) during site preparation works within Phase 1 on existing cleared lands, and/or where site preparation works within Phase 1 have been completed to the standard specified in the VMP and Phase 0 of the BMP.

It is noted that certain works within the VMP and BMP, such as weed and feral animal management, the planting of native vegetation, and the maintenance of existing tracks and trails for bushfire and rural land management (activities permitted under Existing Use Rights)) do not require development consent or a Subdivision Works Certificate prior to commencement. Such works can commence at any time, provided the actions do not adversely impact listed threatened species and ecological communities.

3.2.1 Stage 1 Initial Site Preparation Works within Proposed Conservation Area

The existing biodiversity values of the proposed Conservation Area are high (refer **Figure 36**), and with some restoration and improvement, the area is capable of providing a long term, maintain or improve, local conservation outcome by protecting threatened species habitat (**Figure 35**).

Figure 36 Proposed Conservation Area



Source: RPS Kings Hill Biodiversity Management Plan

To secure this outcome, the SIS recommends implementation of a BMP that will address relevant existing key threatening processes acting on this land for the benefit of the species (e.g. improve vegetation structure, plant species diversity, habitat condition, bushfire threat, predation pressures and competition with exotic fauna).

Works proposed in the BMP include:

- Phase 0: Revegetation in cleared lands to benefit the Koala and winter-spring nectar dependent species (see **Figures 37 to 40**);
- Phase 0: Habitat enrichment works for the Koala (see **Figure 41**);
- Phase 0 and 1: Habitat enhancement (i.e. installation of hollows, emplacement of fallen logs) (see **Figure 42**);
- Phase 0 to 3: Weed management (e.g. removal of Lantana and African Olive) (see **Figure 43**);

- Phase 0 to 3: Feral animal control (e.g. wild dogs, feral cats and deer);
- Phase 1: Fencing of Conservation Areas (see **Figure 45**) to:
    - curb and deter illegal and uncontrolled activities (e.g. illegal dumping, timber getting, hunting)
    - manage existing rural activities that impact on native plants and weed dispersal (e.g. grazing by cattle, horses, goats)

Restoration and improvement works under the BMP will ensure resilient and long term sustainable habitat within the proposed Conservation Area, with BMP works to commence prior to impacts managed under the VMP to enable species transition where desirable.

3.2.1.1 Proposed Revegetation Works

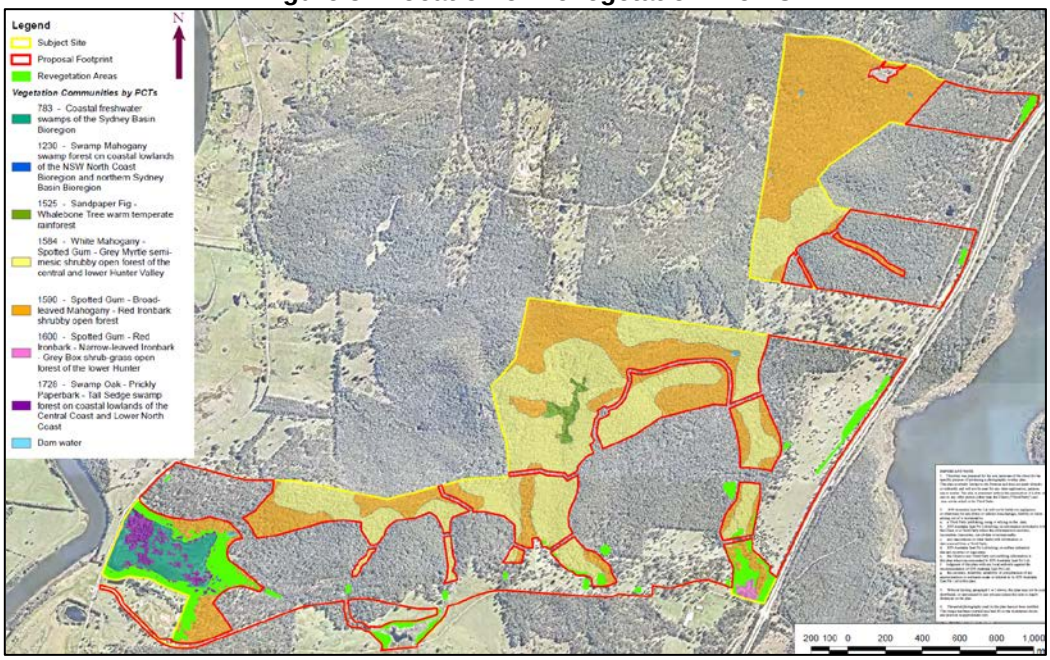
The key revegetation objective is to rapidly establish a tree canopy for foliage biomass production, and the SIS provides (in Section 7.1.1.1.1) particular specifications that predicate the predicted minimum seven (7) year timeframe to ecological benefit.

The total area proposed for revegetation works is 19.30 ha, and the locations suitable and desirable for revegetation are depicted in **Figure 37**.

Revegetation has the specific purpose of delivering long term benefit for the Koala and nectivorous species such as the Grey-headed Flying Fox, Squirrel Glider, Little Lorikeet, Regent Honeyeater and Swift Parrot by planting tree species with known high value foraging values.

Dense plantings of Swamp Mahogany Forest Redgum, Tallowwood, Grey Box and Grey Gum are recommended as they are all classed as preferred high value koala feed tree species and are likely to provide long term ecological benefit for the Koala, Grey-headed Flying Fox (nectar production) and Large Forest Owls (indirectly) through increased habitat occupancy by preferred prey species such as the Brush-tailed Possum (see **Table 8** and **Figure 38** (Area A), **Figure 39** (Area B) and **Figure 40** (Area C).

Figure 37 Location of Revegetation Works



Source: RPS Species Impact Statement

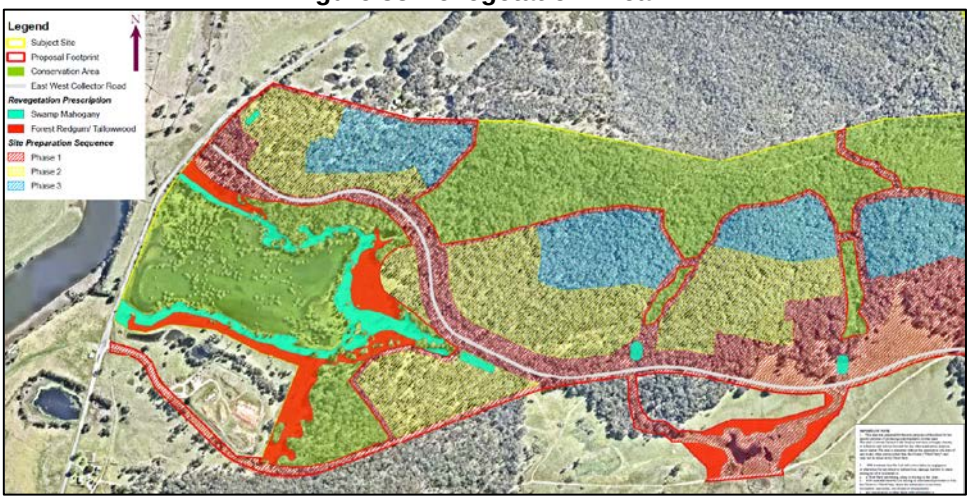
Revegetation works are proposed for currently treeless or heavily degraded parts of the Conservation Area as shown in **Figures 38**, **39** and **40**.

Table 8 Revegetation Works by Area

Area	Revegetation works	Main Benefit
A (Phase 0)	Planting of Swamp Mahogany (*Eucalyptus robusta*) in suitable areas (4.57 ha) Planting of high nutrient value Forest Redgum and Tallowwood in residual areas (7.18 ha)	Winter forage for Grey-headed Flying Fox Spring forage for Grey-headed Flying Fox High value forage for Koala
B (Phase 0)	Planting of Swamp Mahogany (*Eucalyptus robusta*) in suitable areas (1.83 ha) Planting of high nutrient value Forest Redgum, Grey Gum and Tallowwood in residual areas (3.27 ha)	Winter forage for Grey-headed Flying Fox Spring forage for Grey-headed Flying Fox High value forage for Koala
C (Phase 1)	Planting of Swamp Mahogany (*Eucalyptus robusta*) in suitable areas (2.45 ha)	Winter forage for Grey-headed Flying Fox

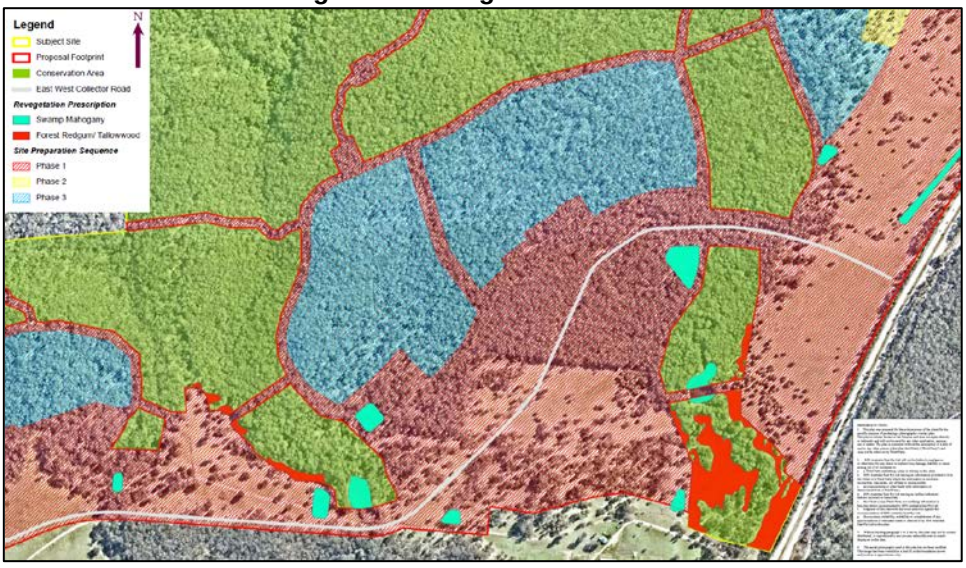
Source: RPS Species Impact Statement

Figure 38 Revegetation Area A



Source: RPS Species Impact Statement

Figure 39 Revegetation Area B



Source: RPS Species Impact Statement

Figure 40 Revegetation Area C

Source: RPS Species Impact Statement

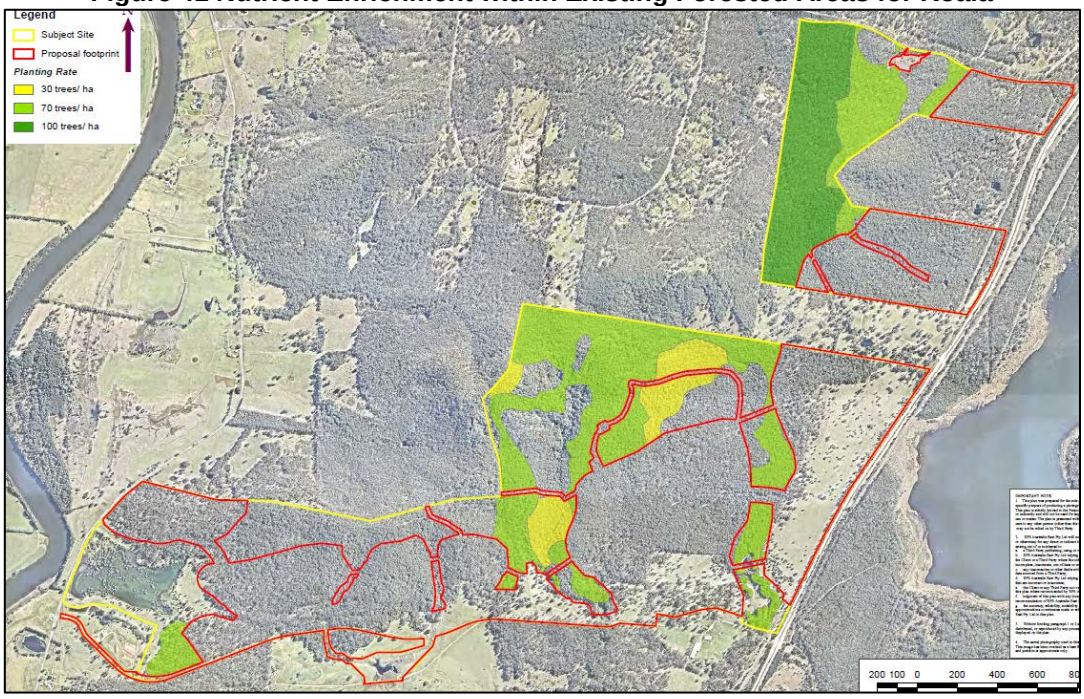
3.2.1.2 Proposed Habitat Enrichment Works for Koala

Revegetation is also proposed in the form of planting within existing forested areas to strategically improve browse quality for the Koala in selected parts of the Conservation Area. This measure aims to increase foliage nutrient levels (**i.e. digestible nitrogen**) particularly in areas of relatively low value (for example, primary weed management areas such as lands occupied by medium to high lantana infestation) (see **Figure 41**).

Approximately 143ha of forest is deemed suitable and proposed for intra-forest enrichment planting, and it is estimated that a modest enrichment program would involve intra-forest plantings of approximately 10,400 high nutrient value trees and/ or tending of existing preferred Koala feed trees provides an optimal prescription that balances effect with other factors (i.e. cost and impact on receiving environment) (see **Table 9**).

The prescription is to use species compatible with the relevant PCTs occurring within the management area (i.e. Tallowwood, Forest Redgum, Grey Box and Grey Gum).

Figure 41 Nutrient Enrichment within Existing Forested Areas for Koala



Source: RPS Species Impact Statement

Other expected benefits include:

- Increased availability of nectar producing plants for the benefit of nectivores such as the Grey-headed Flying Fox;
- Supplement the natural regeneration response in weed management areas; and
- Improve vegetation structure to address adverse historical/ ongoing impacts from feral herbivores and logging/ land clearing.

Table 9 Tree Foliage Nutrient Enrichment

Enrichment Treatment	Purpose	Time to Ecological Benefit
'Tending' of insitu recruiting preferred Koala feed tree species in areas of low digestible nitrogen using stand thinning (gap creation) and selective removal of recruiting tree species with low digestible nitrogen values	• Enrich habitat suitability for canopy folivores[31] • Locally increase fallen log length from thinned tree species • Minimise disruption to existing ecological function	7+ years (Kavanagh and Stanton 2012)
Direct seeding using propagules with known high digestible nitrogen combined with mosaic fire burns to accelerate natural regeneration	• Enrich habitat suitability for canopy folivores[31] with minimal impact on stem densities • Minimise disruption to existing ecological function	Unknown but estimated to be at least 7+ years (Kavanagh and Stanton 2012)
Intra forest tree plantings using forestry tubes propagated from trees with known high digestible nitrogen and low PSMs in areas with low predicted digestible nitrogen and/ or weed management areas	• Hasten forest structure regeneration following weed management • Enrich habitat suitability for canopy folivores[31] with high value digestible nitrogen propagules	Unknown but estimated to be at least 7+ years (Kavanagh and Stanton 2012)

Source: RPS Species Impact Statement

3.2.1.3 Proposed Habitat Enhancement Works

Habitat enhancement involves the installation of hollows and co-location of fallen logs in a targeted manner, so as to complement and enhance habitat for hollow-dependent species in the proposed Conservation Area. This measure involves a diverse array of habitat structures such as those listed below:

- Nest boxes constructed from standard building materials;
- Repurposing of hollows harvested from the Proposal area; and
- Habitat creation from logs harvested from the Proposal

Habitat enhancement works are to be initiated prior to site preparation works within the Impact Area (i.e. during phase 0). The primary purpose of these works is to pre-emptively respond to impacts anticipated through Phases 2 and 3 (i.e. 3 years +) where incremental habitat loss is scheduled.

Habitat enhancement works detailed in **Table 10** are to be initiated and maintained for the duration of site preparation works under Phase 1, with the aim of delivering tangible ecological benefit prior to impacts occurring in Phases 2 and 3.

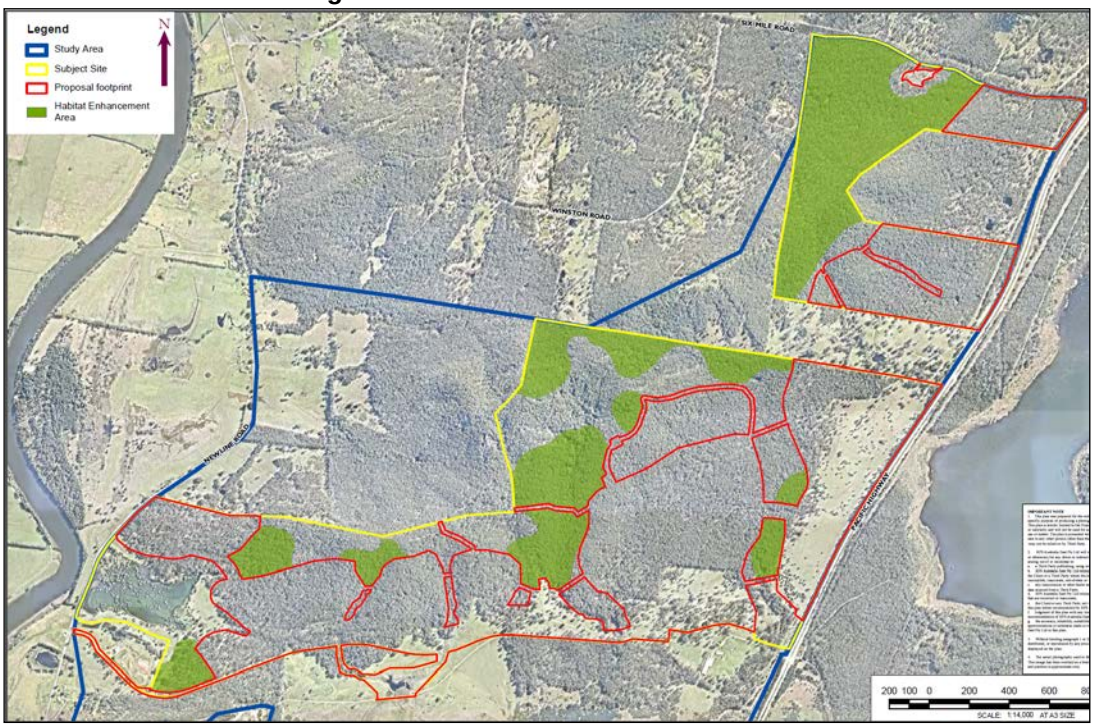
Table 10 Habitat Enhancement and Time to Ecological Benefit

Treatment	Purpose	Time to Ecological Benefit
Revegetation of existing retained treeless lands	Increase the extent of habitat suitability for the canopy folivores[31] Increase the extent of winter – spring flowering eucalypts for nectar dependant species[32]	7+ years (Kavanagh and Stanton 2012)
Hollow and fallen log installation	Mitigate hollow-bearing tree loss observed mainly during phases 2 and 3 Preferentially use natural hollows and hollows created from logs salvaged from the Proposal area Preferentially use hollow types that benefit sensitive threatened species such as Brush-tailed Phascogale	Unknown but estimated to be at least 3+ years

Source: RPS Species Impact Statement

Areas recommended for hollow and log emplacement are characterised by low densities of natural hollow-bearing trees and the presence of trees with > 80cm diameter (see **Figure 42**).

Figure 42 Habitat Enhancement Works



Source: RPS Species Impact Statement

3.2.1.4 Proposed Weed Management

The SIS recommends eradication of the following species that occur on the site, both within the proposed Conservation Area, and within the proposed Impact Area:

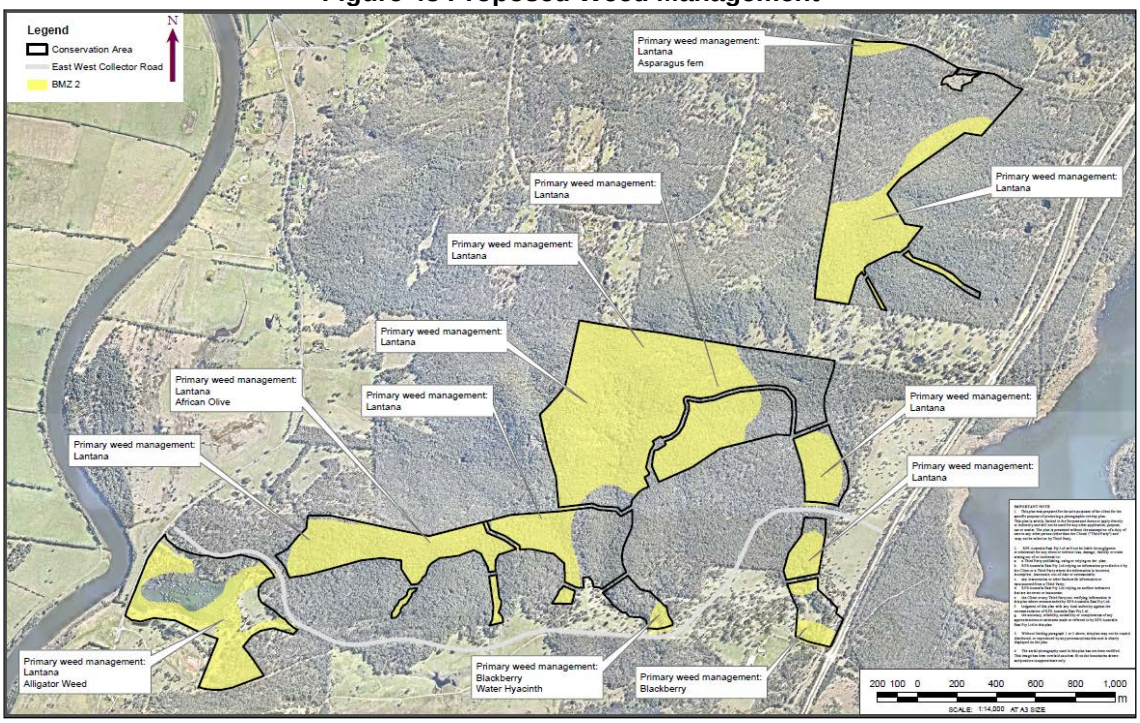
- African Olive (*Olea europaea* subsp. *cuspidata**);
- Lantana (*Lantana camara**);
- Ground Asparagus/Asparagus fern (*Asparagus aethiopicus**);
- Blackberry (*Rubus fruticosus** species *aggregate*);
- Alligator Weed (*Alternanthera philoxeroides**); and
- Water Hyacinth (*Eichhornia crassipes**)
- Fireweed (*Senecio madagascariensis**)

Distribution patterns indicate an occupancy preference for lands with poor accessibility for non-native herbivores such as feral deer and cattle (i.e. not controlled by herbivory). Conversely, highly accessible lands allow for grazing pressures to suppress weed occurrence.

Weeds threaten native plant species through competition for limited resources. Sunlight, nutrient, water and space availability are limited, and an extensive presence of weeds is detrimental to native species. This can change vegetation community composition and lead to ecological issues involving poor soil quality, erosion and sedimentation, decline in fauna foraging and nesting habitats and the extinction of native flora species.

A comprehensive weed management framework is provided in both the BMP for the Conservation Area and VMP for the Impact Area (see **Figure 43**).

Figure 43 Proposed Weed Management



Source: RPS Kings Hill Biodiversity Management Plan

3.2.1.5 Proposed Feral Fauna Management

The SIS recommends eradication of the following species that occur on the site, both within the proposed Conservation Area, and within the proposed Impact Area:

- European rabbit (*Oryctolagus cuniculus*)
- Fallow deer (*Dama dama*)
- European fox (*Vulpes vulpes*)
- Wild dog (excluding Dingo)
- Feral cat (*Felis catus*)

Feral fauna pose severe threats to native flora through herbivory and fauna habitat (i.e. simplification of vegetation structure). The latter threat is considered particularly important to the management of the Koala within the Conservation Area as reduced/ simplified vegetation structure may increase the risk of predation by wild dogs and Dingo.

The SIS recommends pest management in the Conservation Area to protect and maintain native fauna and flora populations, and to encourage re-colonisation into rehabilitated areas.

3.2.1.6 Habitat Protection

3.2.1.6.1 Fencing

The SIS recommends that the interface between the Impact Area and the Conservation Area is to be characterised by a Koala proof fence with Koala bridges and grids, which will have the purpose of:

- Excluding free ranging Koala's from the urban area to prevent mortality from domestic dog attack, swimming pool entrapment, and vehicle strike;
- Excluding domestic dogs from the Conservation Area to prevent mortality from domestic dog attack and enable wild dog management; and
- Aiding the efficient movement of Koalas within the Conservation Area along designated habitat corridors.

The SIS specifies that the fence is to be readily visible from the perimeter roadside environment (i.e. to minimise the incidence of vandalism and loss of primary function) and constructed in a manner so as to allow access for:

- recreational uses (e.g. bush walking, trail riding (mountain bikes and/or horses where appropriate)
- biodiversity management (e.g. implementation of ecological burns, management of edge effects)
- bushfire management works (e.g. fire trail and regular access points)
- maintenance (e.g. fence maintenance, weed and pest management).

Fencing is also proposed in the form of herbivory exclusionary fencing around certain threatened flora species within the Conservation Area. Such fencing is to protect existing populations and future recruitment.

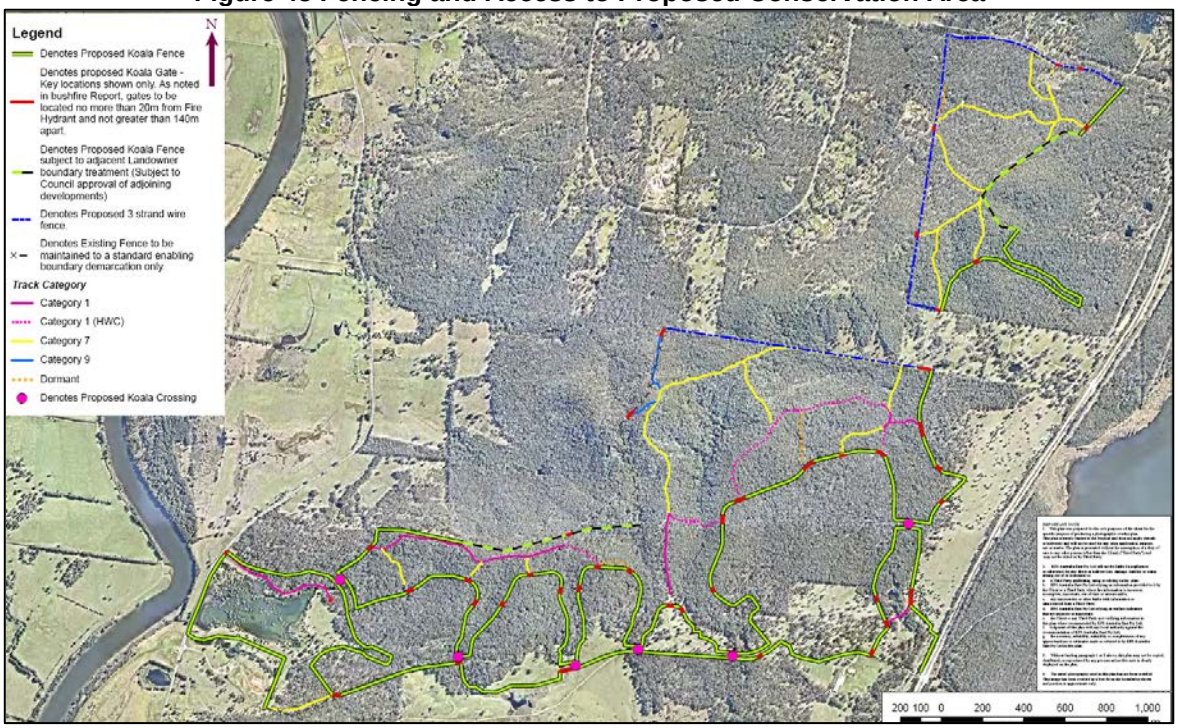
Fencing will also protect the Conservation Area from undesirable activities (such as illegal dumping, 4WD and motorbike activities, logging) and from existing rural activities that are likely to continue until land in the Impact Areas are developed (e.g. grazing by cattle, horse and goats).

A typical Koala fence deemed suitable for this site is shown in **Figure 44**, while **Figure 45** indicatively depicts proposed fencing and access points relative to access trails and Impact Areas, subject to survey of the alignment and construction certificate information (without compromising the Conservation Area).

Figure 44 Typical Koala Fence

Source: RPS Biodiversity Management Plan

Figure 45 Fencing and Access to Proposed Conservation Area



Source: RPS Species Impact Statement

3.2.1.6.2 In-Perpetuity Conservation Agreement

KHD propose to enter a Voluntary Planning Agreement (VPA) with Port Stephens Council to ensure a mechanism is in place to establish, protect, manage and fund the proposed Conservation Area in-perpetuity.

It is intended under the VPA to complete the works specified within the BMP within a five (5) year period (commencing with the issue of the Stage 1 Subdivision Works Certificate (SWC) – to the extent that a SWC is required (see **Section 3.2**)). It is within this time that the proposed Conservation Area will have matured sufficiently to reduce the management required, reverting to a maintenance regime.

Once it is determined that the BMP has been adequately implemented by achieving its objectives, the BMP is proposed to be replaced by a separate 'maintenance' focused management regime in the form of a Biodiversity Conservation and Management Plan (BCAMP). The BCAMP would be funded via the VPA, and will serve to maintain the establishment works achieved through the BMP by focusing on the maintenance of weeds, feral fauna and infrastructure within an in-perpetuity management framework.

A draft BCAMP with specifications and a budget is being developed in collaboration with, and KHD formally submitted an Offer to Port Stephens Council dated 3 February 2020 seeking to enter a VPA which at this stage of assessment, proposes the following:

- The Developer, at its own cost, will implement the Biodiversity Management Plan (BMP) and Vegetation Management Plan (VMP) submitted with the Species Impact Statement for the Concept DA. The Developer's obligations under the BMP and VMP will commence upon the issue of a Subdivision Works Certificate relating to the DA.
- Once the Conservation Area has been established by the Developer through implementation of the BMP and VMP (measured against the Key Performance Criteria in the BMP, to the

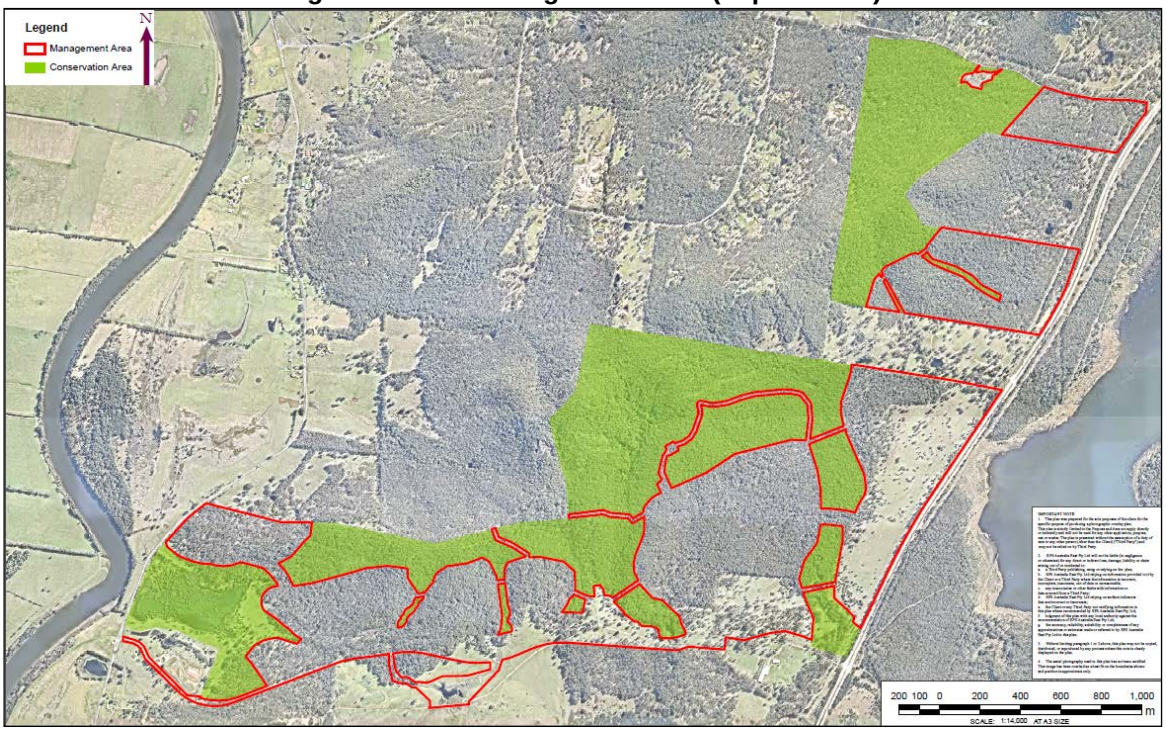
satisfaction of Council), the Developer will transfer the Conservation Area to Council for active management of the land.

- At the time of Concept DA Approval, Council will be satisfied with the terms of a) the VPA detailing the funds (Conservation Area Fund) required to be paid by the Developer to Council to manage the Conservation Area in perpetuity, once it is established, and b) a Biodiversity Conservation and Management Plan (BCAMP) detailing management of the land required to preserve the conservation principles.
- Following transfer of the Conservation Area Fund by the Developer to Council, and following transfer of the Conservation Area to Council, Council will continue management of the land in alignment with the BCAMP.
- The Developer's obligations in maintaining the Conservation Area will cease upon transfer of the Conservation Area to Council. The BCAMP will thereafter operate to ensure biodiversity conservation of the Conservation Area in perpetuity. The VPA would then cease and be removed from title, as the BCAMP will constitute a Plan of Management for the land under the Local Government Act 1993.

3.2.2 Stage 1 Initial Site Preparation Works within proposed Impact Area

The proposed Impact Area (comprising urban zoned land, less those parts included in the Conservation Area) includes a total of 212.14 ha of native vegetation comprising threatened species habitat and 59.87 ha of cleared lands. Site preparation works within the Impact Area are to be carried out under Stage 1 in accordance with the VMP, which refers to the Impact Area as a *Management Area* (see **Figure 46**).

Figure 46 VMP Management Area (Impact Area)



Source: RPS Vegetation Management Plan

The VMP aims is to provide a considered and orderly approach to the removal and/or modification of vegetation and habitat during the site preparation works, particularly the removal of vegetation and

habitat (i.e. impact minimisation) in a manner consistent with the Section D14.33 of Port Stephens Council DCP 2014 (i.e. impact minimisation).

More specifically, the VMP provides a program and specifications for works that aim to:

- Restore and protect creek line and riparian areas;
- Manage impacts on threatened species, endangered ecological communities and habitat trees through implementation of a progressive clearing process that allows time for species to adjust and/or relocate from Impact areas to Conservation Areas;
- Outline the management framework for minimising impacts on vegetation and habitat within the Impact Area;
- Identify the appropriate timing of works including site preparation, resource recovery (extraction of timber, native plants and bushrock etc), planting, weed management, and also providing a schedule of works;
- Identify and assign responsibilities for ongoing management actions over an 8+ year period; and
- Ensure that the project is planned, designed and implemented by informed experienced contractors in order to avoid harm to the quality, stability and natural functions of remnant bushland and riparian areas.

The VMP is also aimed at supporting management and habitat enhancement efforts recommended by the SIS and proposed to be applied under the BMP for the Conservation Area.

Site preparation works within the Impact Area involves the disturbance and progressive clearing of land over an 8+ year timeframe to enable future urban use. The site preparation works are to be carried out in Phases under the VMP to encourage the gradual transition of affected species in impacted areas into the 244.25 ha Conservation Area comprising 'like for like' native vegetation and threatened species habitat restored and improved under the BMP (see **Section 3.2.1**).

Carrying out initial site preparation works in sequential Phases provides a time sequenced framework for managing impact intensity (i.e. impact minimisation). The spatial and temporal partitioning of habitat loss has the purpose of minimising impact intensity on the Conservation Area by restricting early development stages to areas of lower biodiversity value.

In combination with the early implementation of impact mitigation (i.e. establishment of the proposed Conservation Area in Phase 0), the Proposal aims to minimise the nett impact on vegetation and habitat over time by minimising:

- Edge effects and habitat loss through the maintenance of patch integrity and connectivity;
- Disruption of species lifecycles by pre-emptively mitigating habitat loss; and
- Loss in corridor functionality at the local and regional scale by improving corridor widths.

Site preparation Phases are summarised in **Table 11**, and the extent of land subject to site preparation works within each Phase is depicted in **Figure 47**.

Table 11 Summary of Site Preparation Phases

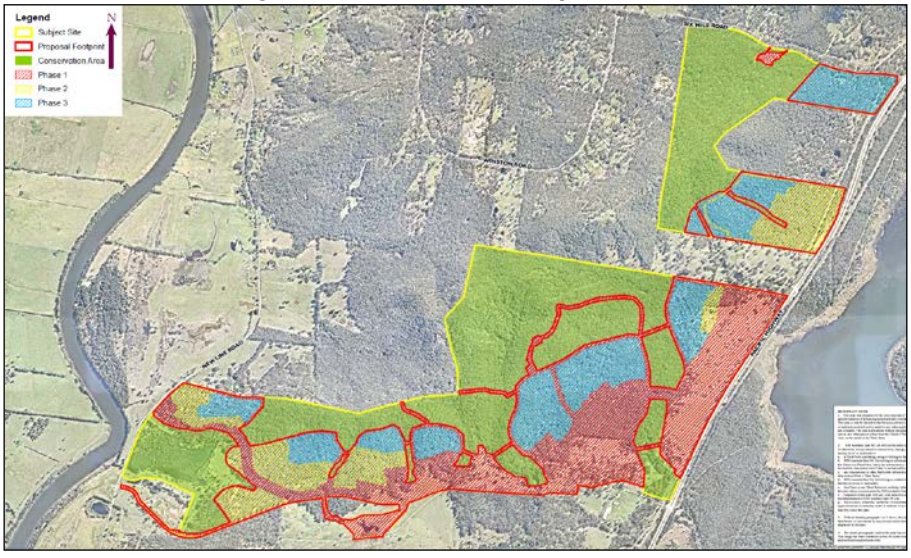
Proposal Phases	Objective	Time (years)	Vegetation Change[28] (ha)
Phase 0: Pre-construction habitat restoration and enhancement works	• Enter a Planning Agreement to secure implementation of the following Phases • Commence BMP works to establish the Conservation Area (i.e. early implementation of amelioration measures) • Collect baseline dataset for monitoring program • Initiate research compensatory measure	-2 to 1	- 0.00 + 11.23 (Area A) + 3.27 (Area B)
Phase 1: Construction of main east – west road connecting the Pacific Highway interchange with Newline Road plus development of areas with reduced biodiversity value	• Minimise impacts on *Corybas* × *dowlingii* • Performance test the efficacy of amelioration measures for Phase 1 (monitoring) • Finalise establishment of Conservation Area by completing the BMP • Continue research compensatory measure • Deliver compensatory measures for the Koala, Brush-tailed Phascogale, Large Forest Owls, *Pterostylis chaetophora*, *Corybas* × *dowlingii* and *Maundia triglochinoides*	1 to 3	- 75.88 + 0.53 (Area A) + 1.81 (Area B) + 2.46 (Area C)
Phase 2: Selective construction of development areas with reduced biodiversity value	• Minimise impacts on *Corybas* × *dowlingii* • Finalise arrangements for the in perpetuity conservation of the Conservation Area • Performance test the efficacy of amelioration measures • Conclude research compensatory measure	>3 to 8	- 48.71
Phase 3: Construction of residual approved development areas	• Maintain mitigation measures and monitoring program • Performance test the efficacy of amelioration measures	>8 +	- 87.55

[28] Native vegetation gain relates to the revegetation of lands currently void of a tree canopy

Source: RPS Species Impact Statement

Table 11 indicates that development within the Impact Area can begin to be carried out (subject to development consent) during site preparation works within Phase 1 on existing cleared lands, and/or where site preparation works within Phase 1 have been completed to the standard specified in the VMP and Phase 0 of the BMP.

Figure 47 Phased Site Preparations



Source: RPS Species Impact Statement

As noted in **Section 3.2**, certain works within the VMP and BMP can commence at any time (weed and feral animal management, planting native vegetation, maintaining existing tracks and trails for bushfire threat management and existing rural activities with Existing Use Rights), provided the works do not adversely impact listed threatened species and ecological communities.

Site preparation works within the Impact Area involves three (3) steps of sequential vegetation clearing within each Phase to ensure clearing activities are sensitive to the habitat needs of affected species.

- Step 1: Exotic flora removal;
- Step 2: Partial vegetation removal; and
- Step 3: Complete vegetation removal.

To ensure impact minimisation, to prevent premature and indiscriminate clearing, and to facilitate the movement of fauna into adjoining vegetation:

- Step 1 can occur at any time in accordance with the *Biosecurity Act* 2015;
- Step 3 in any Phase can only occur to the extent that consent is granted for development within that Phase, thereby preventing indiscriminate clearing. This requires the satisfactory competition of Steps 1 and 2, each having the purpose of minimising impacts over time on affected species. By way of example:
    - Step 2 of Phase 2 cannot proceed until Step 3 of Phase 1 is completed for all areas contained within Phase 1 (i.e. a process facilitating the movement of fauna into adjoining vegetation).
    - Similarly, Step 2 of Phase 3 cannot proceed until Step 3 of Phase 2 is completed

The works proposed within each Step are summarised below:

Step 1: Targeted removal of exotic species under Section 21 of the *Biosecurity Act* 2015.

Species with a biosecurity duty are to be eliminated and/ or minimised to an extent that is consistent with prescribed control measures. Such activities apply to the whole subject site (i.e. both Impact Area and Conservation Area) with notable species noted in **Section 3.2.1.4** and **Section 3.2.1.5**.

Step 2: Partial vegetation removal where the purpose of this intermediate step is to:

- Gradually establish areas proposed for future urban purposes (impact areas), to:
    - Provide adequate time for impact mitigation measures to be established in [or at the interface with (e.g. fencing)] the Conservation Area; and
    - Minimise impact intensity on native flora and fauna in lieu of a future complete clearing event (i.e. minimise the temporal effects by delaying the clearing of important habitat thereby provide opportunity for displaced fauna to gradually relocate to improved habitat in the adjoining Conservation Area).
- Provide an opportunity for the recovery of habitat resources for use in mitigation works performed within the Conservation Area (i.e. recover logs, bushrock, and natural hollows); and
- Provide separation between the bushfire threat and development through the construction of bushfire Asset Protection Zones (APZ) as outlined in Section 3.2.1 “Staged Development” of *Planning for Bushfire Protection 2018*.

The prescription for partial vegetation removal is to meet the following specifications:

- Maintenance of all retained vegetation to an APZ standard to ensure radiant heat exposure <29kW/m2 towards residential development and < 10kW/m2 towards Special Fire Protection Purpose Developments;
- Retention of Preferred Koala Feed Trees (PKFT) with a diameter at breast height (dbh) of 300 mm or more; and
- Retention of hollow-bearing trees and/or other tree species deemed suitable by an arborist and bushfire consultant for inclusion in urban landscapes to enhance visual amenity and provide foraging and roosting habitat for species adapted to urban landscapes.
- Preclearance surveys and clearing supervision to avoid harm to fauna.

The partially cleared state is, at all times, required to demonstrate sufficient landform stability (e.g. negligible evidence of erosion) to maintain satisfactory water quality standards at the catchment scale.

Step 3: Complete native and exotic vegetation removal with the exception of trees deemed suitable by an arborist and bushfire consultant for inclusion in urban landscape, subject to compatibility with engineered structures.

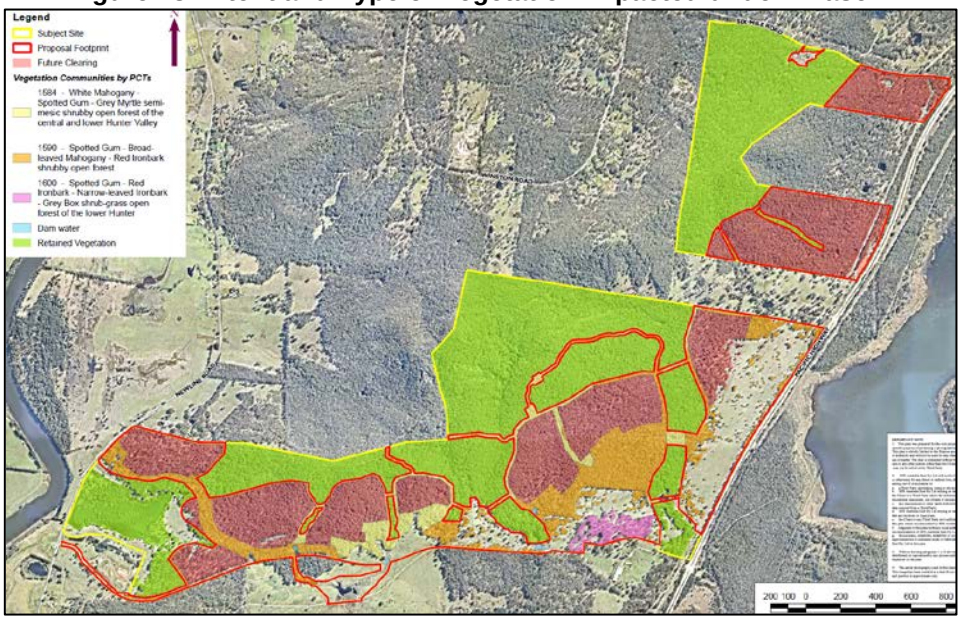
Consideration should be given to the integration of suitable tree species into the urban landscape.

Soil and erosion management procedures are to be applied in this step to ensure satisfactory water quality standards at the catchment scale, with specific details of these management specifications to be provided in the approved subdivision works certificate for the corresponding construction activities.

Preclearance surveys and clearing supervision is to apply to avoid harm to fauna.

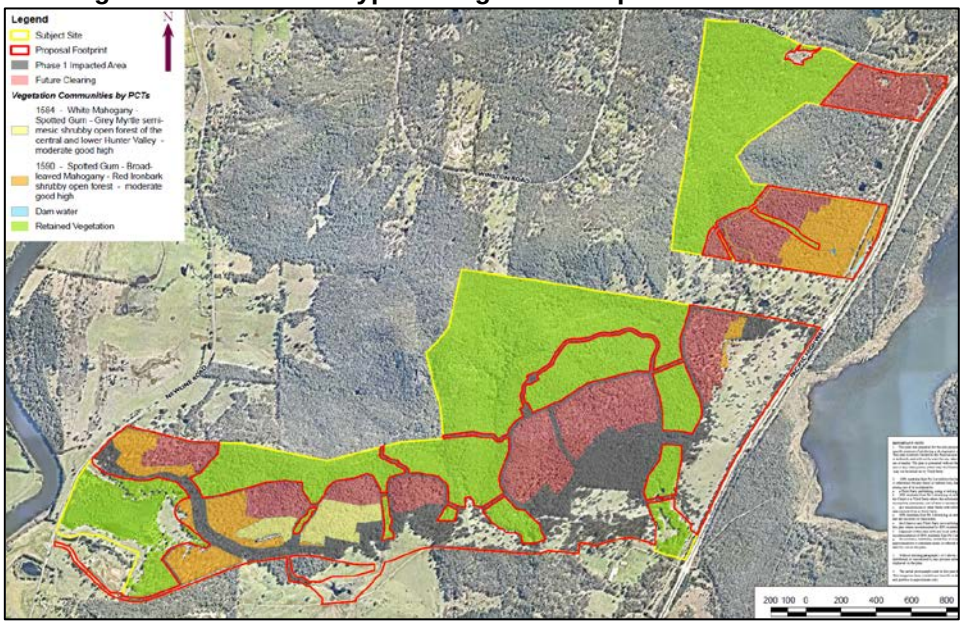
Table 11 indicates the quantum of vegetation change as a result of Stage 1 site preparation works, while the extent and type of vegetation clearing within each Phase is illustrated in **Figures 48**, **49, 50**.

Figure 48 Extent and Type of Vegetation Impacted under Phase 1



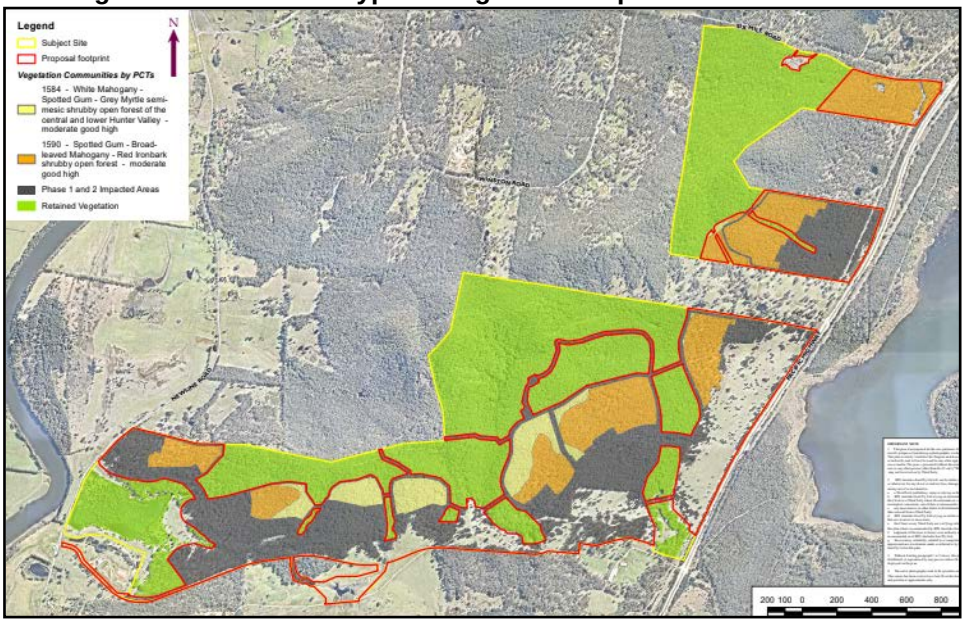
Source: RPS Species Impact Statement

Figure 49 Extent and Type of Vegetation Impacted under Phase 2



Source: RPS Species Impact Statement

Figure 50 Extent and Type of Vegetation Impacted under Phase 3



Source: RPS Species Impact Statement

3.2.3 Summary of Stage 1 Subdivision Works (Initial Site Preparation Works)

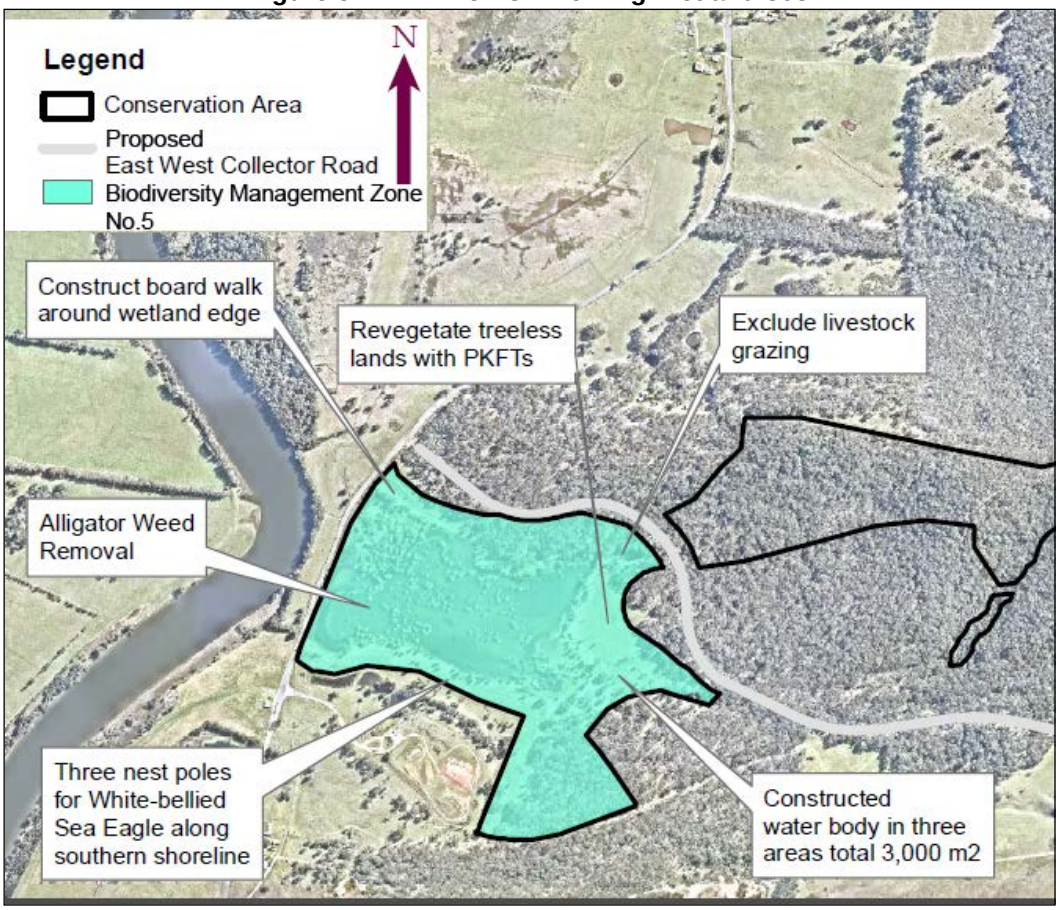
Combined, the Phased site preparation works and impact avoidance strategy provides a framework that will minimise impact intensity on sensitive biodiversity values; thereby minimising the magnitude of both direct and indirect impacts associated with the listed key threatening process (KTP) of 'land clearing' and correlated KTPs.

The key principles that underpin this strategy are:

- Avoid impact amplification through indiscriminate habitat removal (see **Figures 47** to **50**);
- Progressively remove vegetation and habitat using sensitive time, method and area based prescriptions to permit ongoing ecosystem functioning (**Section 3.2.2** and **Appendix H**);
- Maintain the functionality of vegetated corridors (i.e. width and value) as shown in **Figure 34**;
- Increase residual patch size (i.e. revegetation works) – see **Figures 37, 38, 39 and 40**;
- Reduce edge to area ratios (i.e. managing edge effects on residual vegetation); and
- Minimising short, medium and long term impacts on sensitive biodiversity through managed retention and protection in the Conservation Area (e.g. hollow dependent species and specialist folivores).

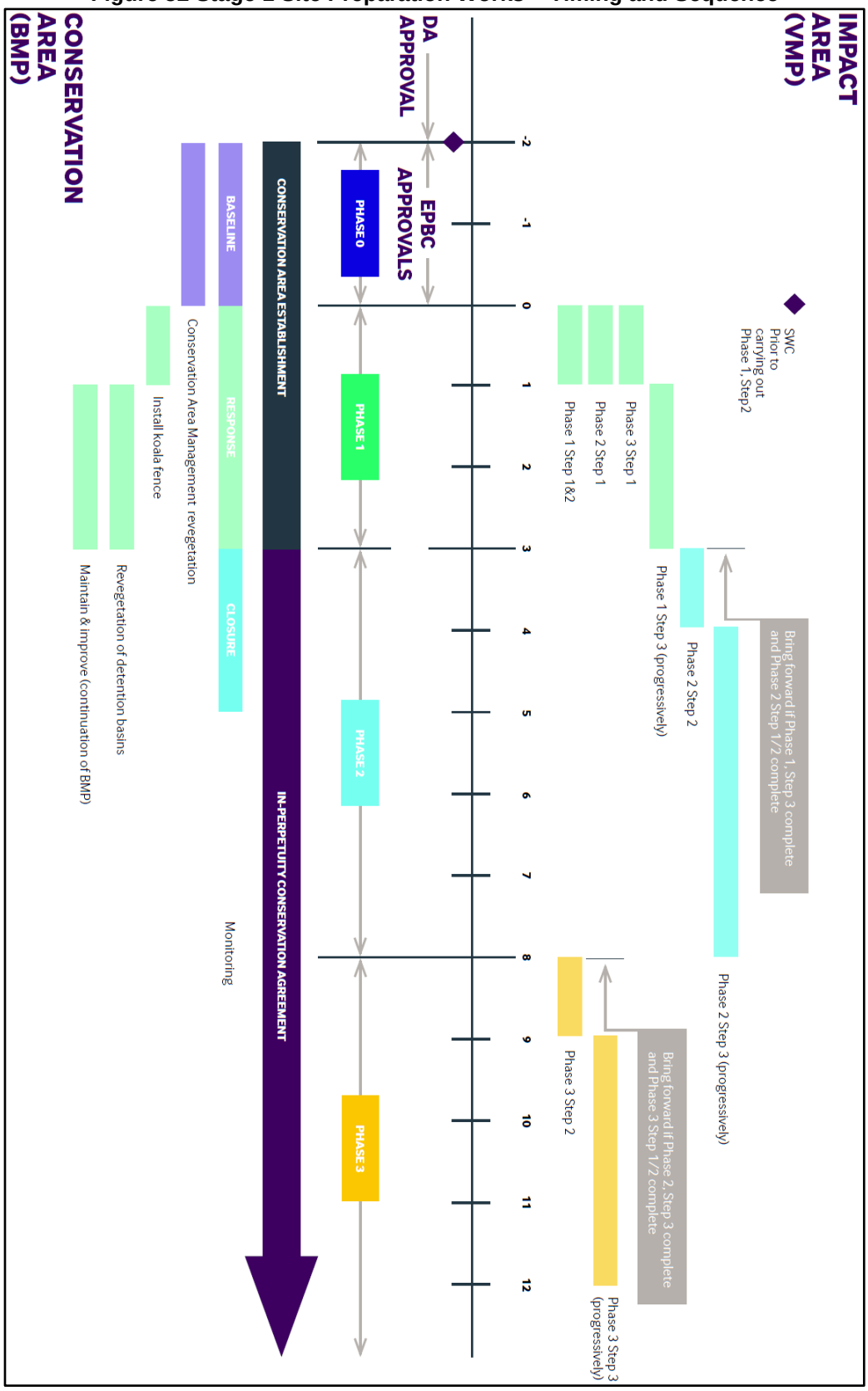
The program and specifications for carrying out Stage 1 Site Preparation Works are comprehensively documented in the BMP and VMP (see **Attachments G and N**). Both documents were developed specifically for the site on the basis of the SIS. An example of the works proposed under the BMP is provided in **Figure 51**, while the sequence and expected timing of the Stage 1 site preparation works are presented graphically in **Figure 52**.

Figure 51 BMP Works Involving Wetland 803



Source: JWP based on RPS Kings Hill Biodiversity Management Plan

Figure 52 Stage 1 Site Preparation Works – Timing and Sequence



Source: RPS Species Impact Statement

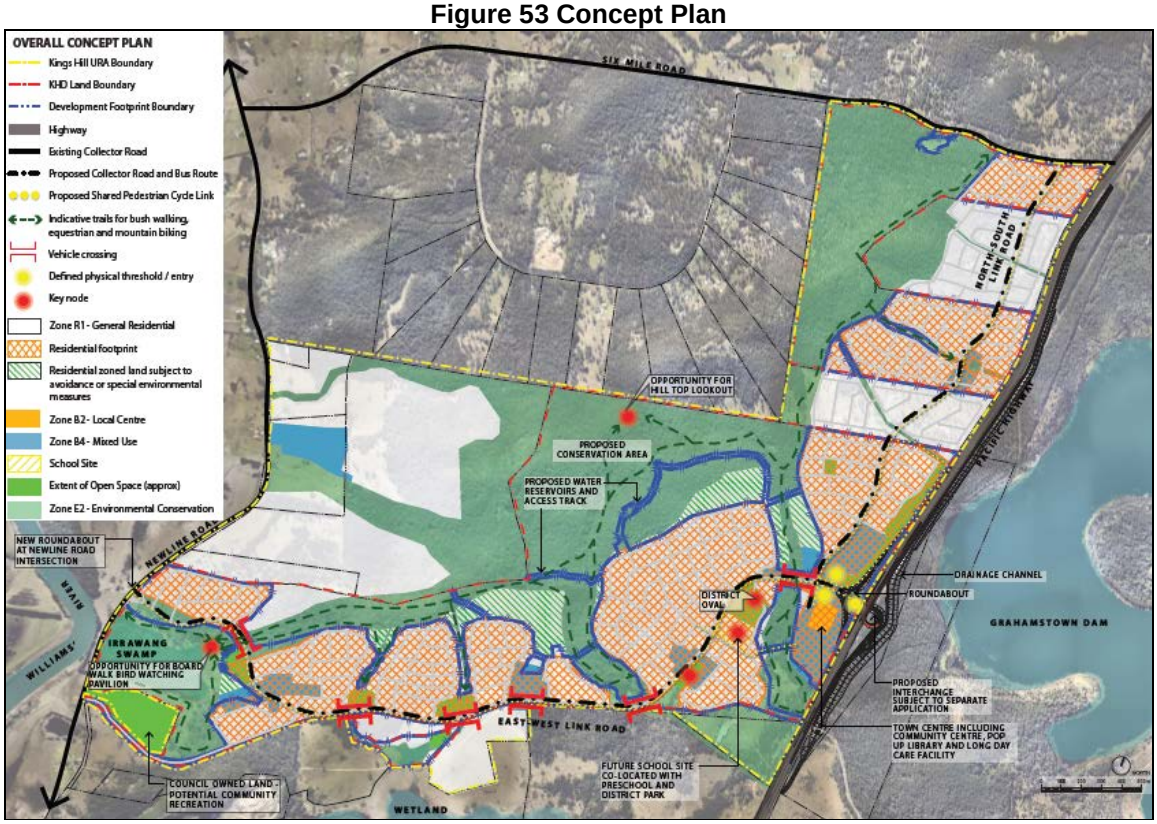
3.3 Concept Development Proposal

3.3.1 Structural Elements of the Concept Proposal

Structurally, the Concept Proposal is summarised as comprising the following (see **Figure 53**):

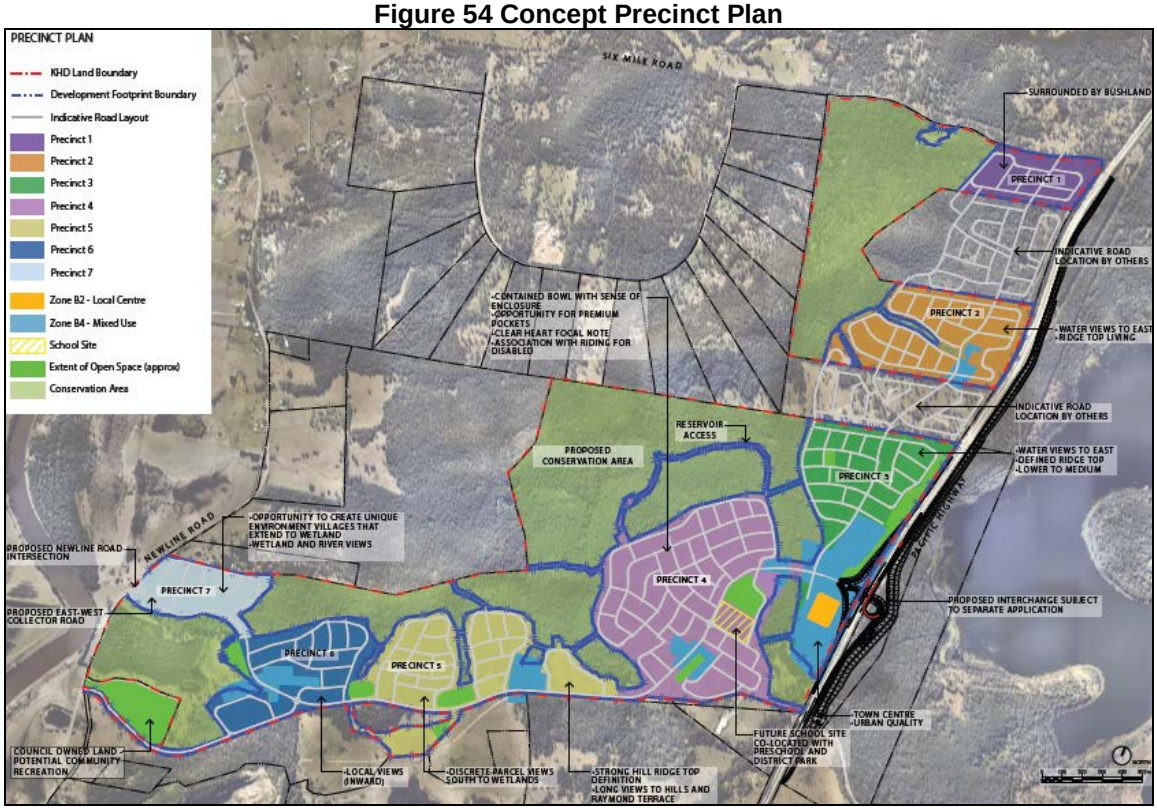
- Urban development within the urban zoned land with a targeted lot yield of 1,900 residential lots distributed between seven (7) residential precincts (see **Figure 54**);
- A new commercial and retail town centre adjacent the Pacific Highway, supported by mixed use zoned land within the walkable catchment of the town centre;
- A public primary school site collocated with proposed open space with capacity for sporting fields;
- A 3.5km long east-west collector road and prospective bus route linking between the residential precincts, the school sites, and the new town centre (providing flood free access for the KHURA between Newline Road in the west, and the Pacific Highway in the east), including:
    - a potentially iconic/entry statement bridge span (once agreed with Council); and
    - dual lanes in each direction for 750m of the eastern extent (once agreed with Council);
    - eight (8) creek crossings (including the abovementioned bridge span);
- A 2.5km long north-south collector road linking between the proposed new town centre and Six Mile Road and four (4) creek crossings (about 50% of the collector road and three(3) of the creek crossings are located on adjoining land);

Figure 53 Concept Plan



Source: PDS based on Northrop Engineers

Figure 54 Concept Precinct Plan



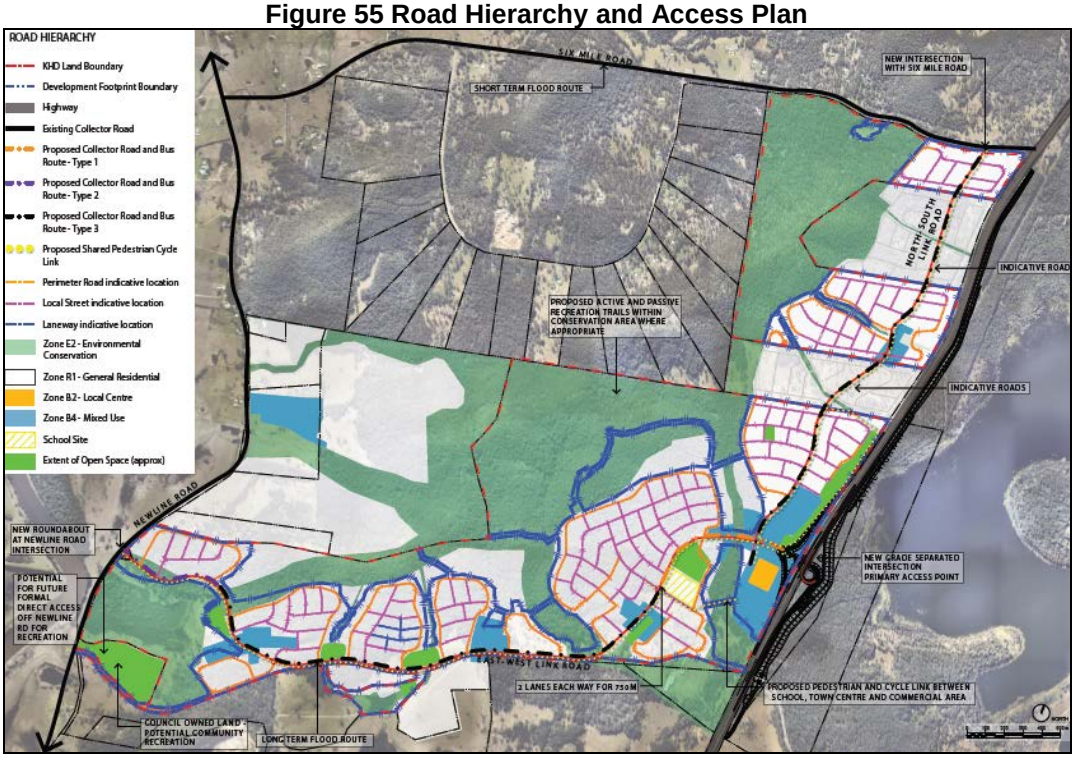
Source: PDS based on Northrop Engineers

3.3.2 Proposed Access and Connectivity

Proposed access to the external road network, and internal road, cycle and pedestrian connectivity consists of the following elements:

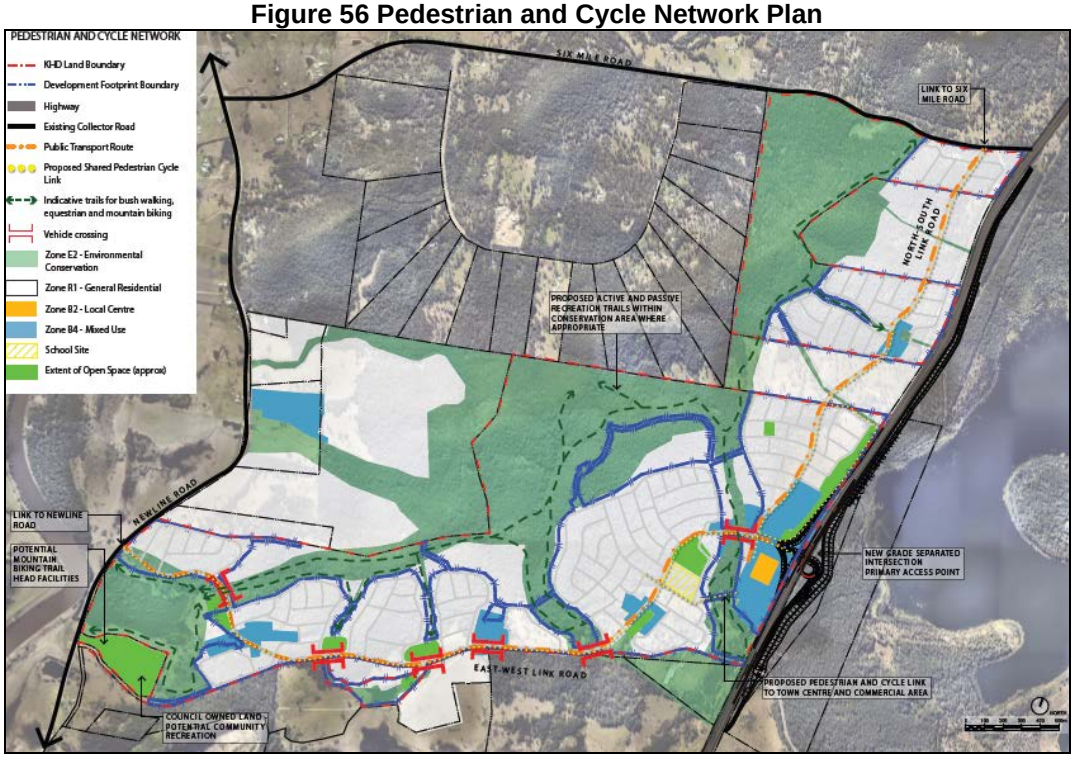
- Four (4) new intersections (see locations in **Figure 55**):
    - The primary access point - a grade separated interchange connecting the East-West Collector Road with the Pacific Highway (subject of separate approval process – to be delivered under State VPA by the TfNSW) (see **Figure 59**);
    - A roundabout connecting the East–West Collector road with Newline Road (see **Figure 60**);
    - An internal, at-grade four (4) leg signalised intersection proving access between the proposed new town centre, the North-South Collector Road, and the Pacific Highway interchange (see **Figure 63**);
    - A simple Give Way controlled T-intersection connecting Six Mile Road with the proposed North-South Collector Road.
- Perimeter roads and associated bushfire asset protection zones within each residential precinct, and along the fenced interface with the proposed Conservation Area;
- A shared pedestrian and cycle path in parallel with and passively supervised by both collector roads, suitable for all ages and abilities running along flat grades, interconnecting the residential precincts with the school site, the proposed town centre and associated employment areas, and passive and active recreation nodes including each open space area (see **Figure 56**);
- A potentially iconic pedestrian and cycle bridge (once agreed with Council) linking the town centre with the school site and associated residential precinct.

Figure 55 Road Hierarchy and Access Plan



Source: PDS based on Northrop Engineers

Figure 56 Pedestrian and Cycle Network Plan



Source: PDS based on Northrop Engineers

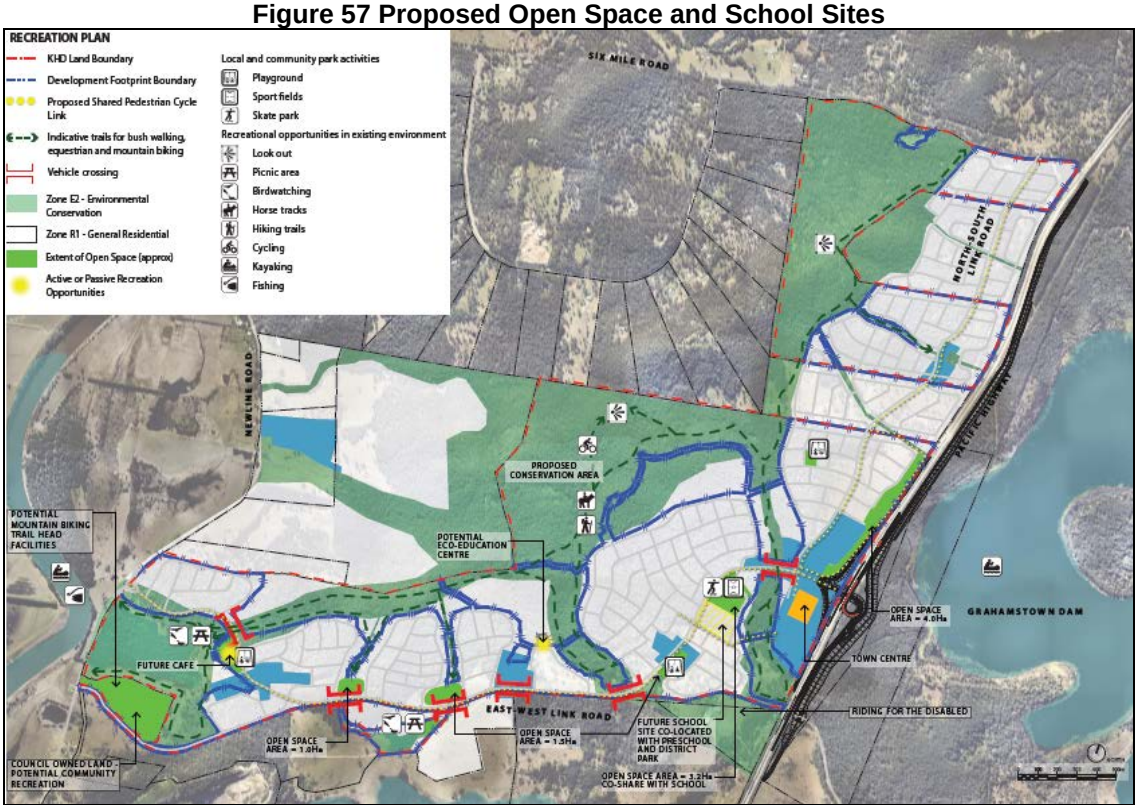
Upon the Pacific Highway interchange becoming operational, the State VPA and the TfNSW require closure of all existing site access points with the Pacific Highway including the existing Riding for the Disabled access point (to be serviced by new access within the first stage of future development reliant on interchange), and the closure or modification of the Six Mile Road intersection with the Pacific Highway to a Left–in Left-out configuration.

3.3.3 Proposed Community, Open Space and Recreation Facilities

Provision is made in the Proposal for a range of community and recreation facilities as recommended by the *Kings Hill Urban Release Area Community and Recreation Infrastructure Study* (GHD, March 2020). In accordance with the study, the plan includes (see **Figure 57**):

- Six (6) local parks (total 3.5ha) co-located with water management devices where appropriate, with four (4) furnished with playgrounds;
- One (1) district park (3.5ha) with capacity to be furnished with a skate park and two (2) multipurpose courts;
- One (1) community centre and library (200m^2) to be located in town centre/district park;
- Two (2) long dare care centres to be co-located with community centre and/or public school;
- One (1) preschool to be co-located with public school;
- One RFS Building (to be planned in consultation with RFS)

Figure 57 Proposed Open Space and School Sites



Source: PDS based on Northrop Engineers

The Proposal also identifies other opportunities to be further explored by KHD in collaboration with Council, owing to the attributes of the site and the comparative advantages of the location. Broader public benefits are available to the local community and the wider population of Port Stephens and the Lower Hunter given the potential for public and/or private ventures within and adjacent the site. The recreation plan (see **Figure 57**) therefore makes provision for:

- Two (2) sites selected with potential for active or passive recreation opportunities such as eco or cultural ventures, or research and education facilities
- Potential to use the Council owned open space off Newline Road for Mountain Bike trail head and associated active recreation facilities and activities (subject to refining arrangements with Council) ; and

- Passive recreation opportunities within the proposed Conservation Area (horse, mountain bike and bushwalking trails) in locations determined compatible with Conservation objectives (existing and proposed dual purpose bushland trails (for maintenance access, biodiversity management and monitoring, and bushfire management), a boardwalk along wetland 803, and two (2) proposed birdwatching platforms.

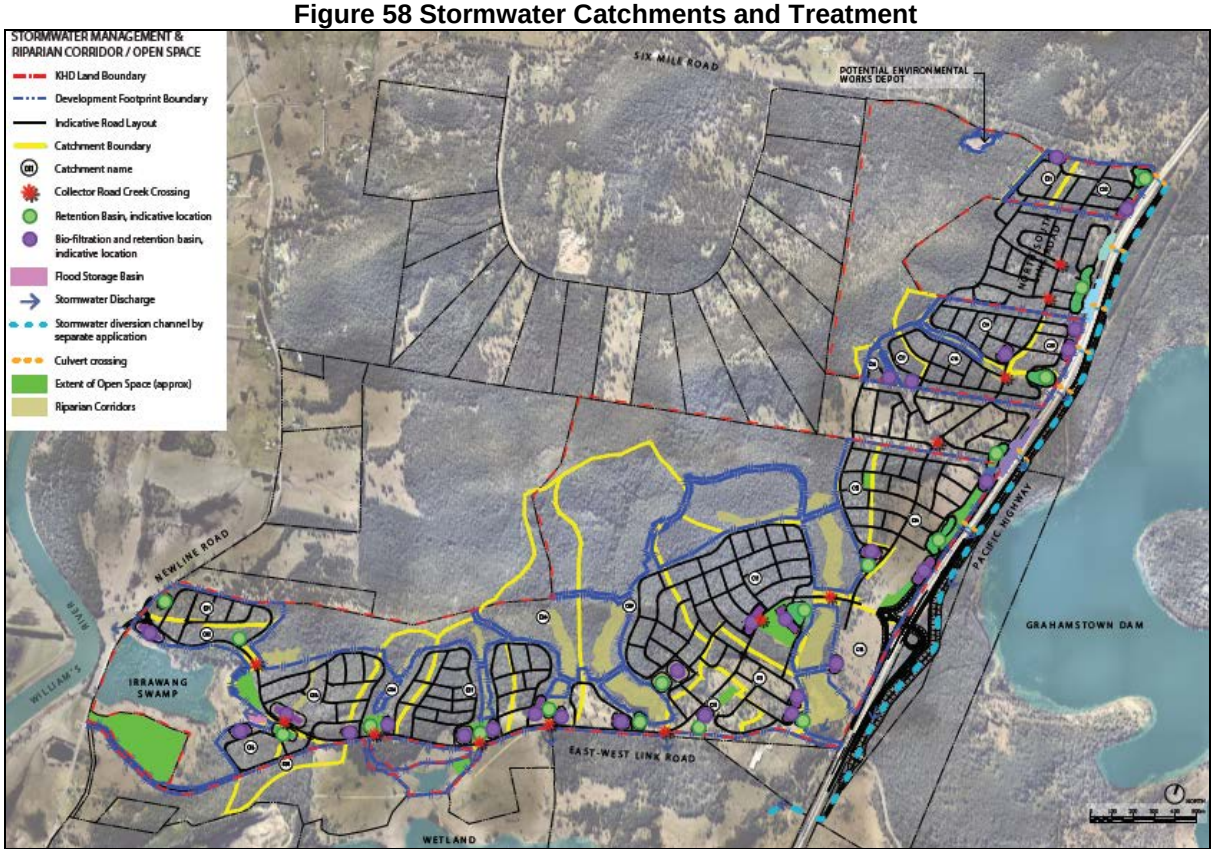
The timing and delivery of the above is subject to the preparation of the Kings Hill Contributions Chapter and completion of these works are subject to consultation with Council

3.3.4 Proposed Ancillary Infrastructure

Water supply and stormwater management infrastructure is proposed in the following forms and locations within the Proposal:

- Two (2) Water Supply Reservoirs (High level and Low level) with provision for two (2) Reservoir access roads (subject to Reservoir design and approval) (see **Figure 53**);
- Stormwater management devices, including bio filtration and retention basins, and a prospective Environmental Protection Works Depot (<u>once agreed with Council</u>) (see **Figure 58**);

Figure 58 Stormwater Catchments and Treatment



Source: PDS based on Northrop Engineers

A stormwater diversion channel to protect Grahamstown Dam drinking water supply is proposed which is the subject of a separate approval process, and is to be delivered under the State VPA by the TfNSW (see **Figure 58 an Figure 59**).

<u>NOTE:</u>
Items noted as '<u>once agreed with Council</u>' remain subject to agreement with Port Stephens Council as to the standard of infrastructure acceptable for dedication to Council and funding or delivery as Works in Kind under a Kings Hill s7.11 Contributions Plan and/or a Local VPA.

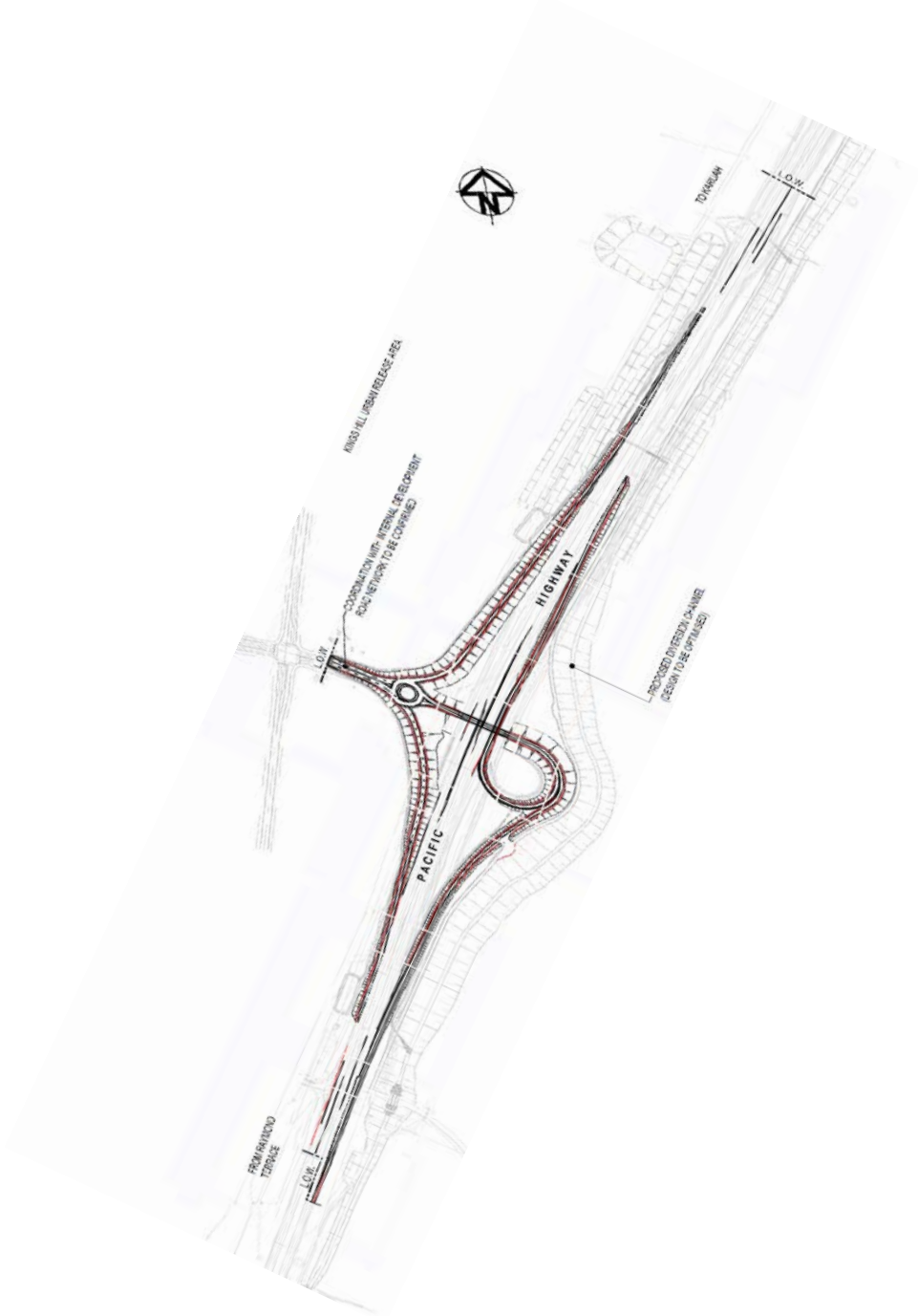
3.3.5 Preliminary Design Concepts

3.3.5.1 Proposed Pacific Highway Interchange

Although the subject of a separate design and approval process by the TfNSW, the primary access point to the Concept Proposal is via a proposed grade separated interchange.

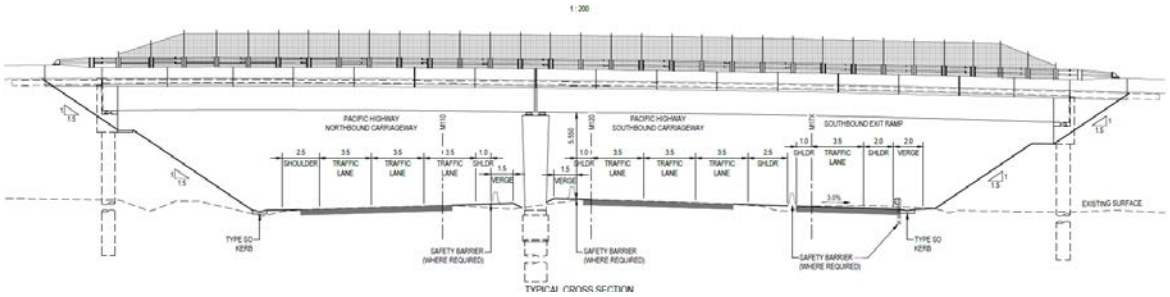
The 50% Concept Design being progressed by the TfNSW caters for additional (3rd) north and south bound lanes on the Pacific Highway (see **Figure 59** and **Figure 60**).

Figure 59 Pacific Highway Interchange 50% Concept Design



Source: TfNSW 21 February 2020 annotated by JWP

Figure 60 Interchange Bridge 50% Concept Design



Source: TfNSW 21 February 2020 annotated by JWP

In the State VPA executed in October 2019 between KHD, the NSW Department of Planning and Environment, and the (then) RMS (now TfNSW), undertake to use their best endeavours to fund and deliver an interchange in time to enable access and egress via the Pacific Highway.

Until the interchange is operational, however, the State VPA permits access off Newline Road for up to 400 lots within the KHURA. KHD's proportion of that lot allowance is 250 lots.

3.3.5.2 Proposed Newline Road Intersection

The east-west collector road is proposed to intersect with Newline Road in a location that:

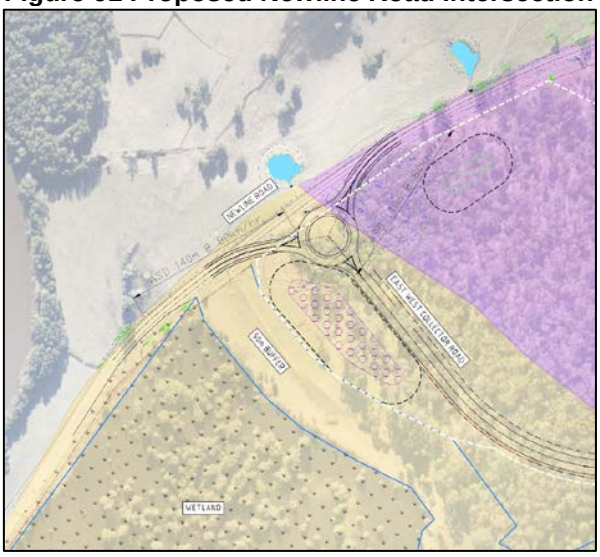
- allows the east-west collector to be efficiently and feasibly located, with an alignment that is capable of accessing developable land for most of its length;
- enables access and egress in a location that is outside of the odour buffer associated with the Suez waste management facility (about 1km to the south along Newline Road); and
- provides an entry point with scenic values and high amenity (adjacent Wetland 803).

In 2015, KHD consulted with the (then) RMS and Port Stephens Council to have the then 100km/h sign posted speed reviewed, and a lower sign posted speed considered (60km/h or 80km/h) given the future urban interface and desired urban amenity. A safety audit by the RMS determined the most appropriate speed zone to be 80km/h and in late 2019, an 80km/h sign posted speed zone came in to affect.

Various configurations were tested by Northrop, but a roundabout with a design speed of less than 80km/h was deemed an optimum solution given the environment of the location (see **Figure 61**).

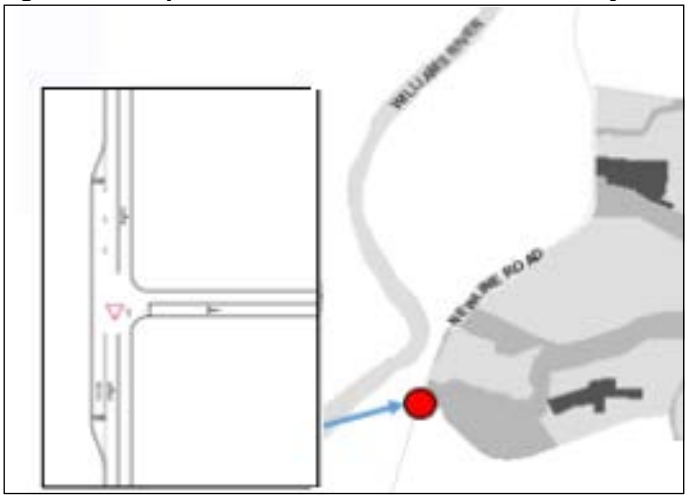
Seca Solutions Pty Ltd reviewed the roundabout configuration and deemed it an appropriate response to the 80km/h sign posted speed. However, the intersection location and the roundabout configuration supported by Seca Solution differs from the location and configuration recommended by GHD in their review of the local traffic network in April 2019 (refer **Figure 62**).

Figure 61 Proposed Newline Road Intersection



Source: Northrop Engineers

Figure 62 Proposed Newline Road Intersection by GHD



Source: GHD Kings Hill Updated Traffic and Transport Study April 2019

The Northrop roundabout design is derived from a more detailed analysis including detailed survey of the existing Newline Road alignment and profile relative to the adjoining property boundary locations and ground levels in the vicinity of the existing road. The survey confirms that the horizontal and vertical alignment of the existing road and carriageway is suitable for an intersection in an 80km/h zone, adopting a roundabout geometry.

The roundabout is an efficient design response to the features of the location, which include:

- proximity to Wetland 803 and its associated buffers and flood level, which together limits the extent of any design toward the south of the nominated location;
- The location and design minimise the extent of earthworks, given:
    - the topography rises up steeply toward the east to the north of the nominated location; and
    - Newline Road is considerably elevated relative to the ground level of private property west of the current alignment.

- Sight distance on southern and northern approaches for an 80km/k design speed becomes compromised further south and north of the nominated location;
- The geometry and the location avoids any significant realignment of Newline Road, or relocation of existing infrastructure, or a need to acquire adjoining private property;
- The design involves previously disturbed roadside land formerly used as a borrow pit and quarry resource;
- The design provides for an east-west collector road alignment that:
    - correlates generally with the zoning boundaries;
    - is well outside of the 50m recommended wetland buffer, ensuring room for downslope stormwater devices to also remain outside the buffer; and
    - provides an alignment that forms a permitter road providing amenity and passive supervision of the wetland.

3.3.5.3 Proposed Intersection between Collector Roads

Traffic modelling by GHD commissioned by Council in 2019 indicates that when the KHURA is ultimately developed, the eastern-most 750m of the east-west collector road will have traffic loads warranting 2 lanes in each direction connecting with the Pacific Highway interchange.

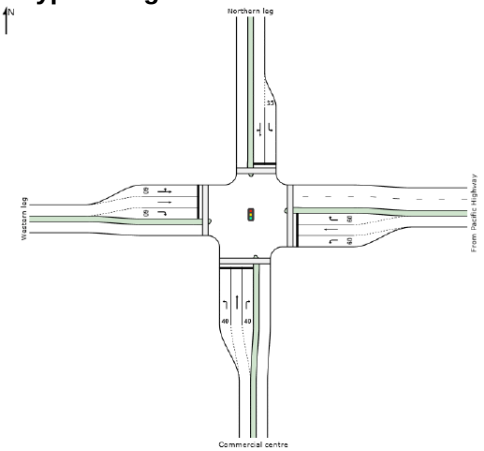
Additionally, the east-west collector road intersects with the north-south collector road and access to the proposed Town Centre at a point that is on the approach to the interchange. This gives rise to a four (4) way intersection and a need to ensure that ultimate traffic loads accommodate acceptable queue lengths, turn lanes, and pedestrian and cycle access. Certainty of design is required to inform land-take and proximity to riparian areas, connecting road and drainage alignments, construction costs, and options to stage the intersection delivery (for example, if and when signalisation is required).

Seca Solutions modelled roundabout control and traffic signal controlled intersection options for the ultimate morning and afternoon peak hour movements using *Sidra*. The results can be noted in their Technical Design Note in **Attachment F**.

Seca found that a roundabout offers a better operational environment, with reduced delays and queues, and that out of the peak hour, when the traffic flows are lower, the delays for road users for the roundabout option would be negligible. Traffic signals would however create delays due to a driver potentially arriving at the signals just after a green Phase and having to sit and wait for the signals to complete their cycle before getting a green signal. However, the advice notes that a roundabout is not as safe or convenient for cyclists or pedestrians compared with traffic signals where a dedicated Phase can be provided for both cyclists and pedestrians.

Given the location of the intersection, which is adjacent attractors such as the proposed town centre, the eastern school site, and a range of active open areas, the design team determined that the traffic environment must be pedestrian and cyclist friendly. Options to provide under and over pass linkages were discounted due to the flat topography. Consequently, a 4-way signalised intersection is adopted by the Concept Proposal (see **Figure 63**).

Figure 63 Typical Signalised Intersection Configuration



Source: Seca Solution

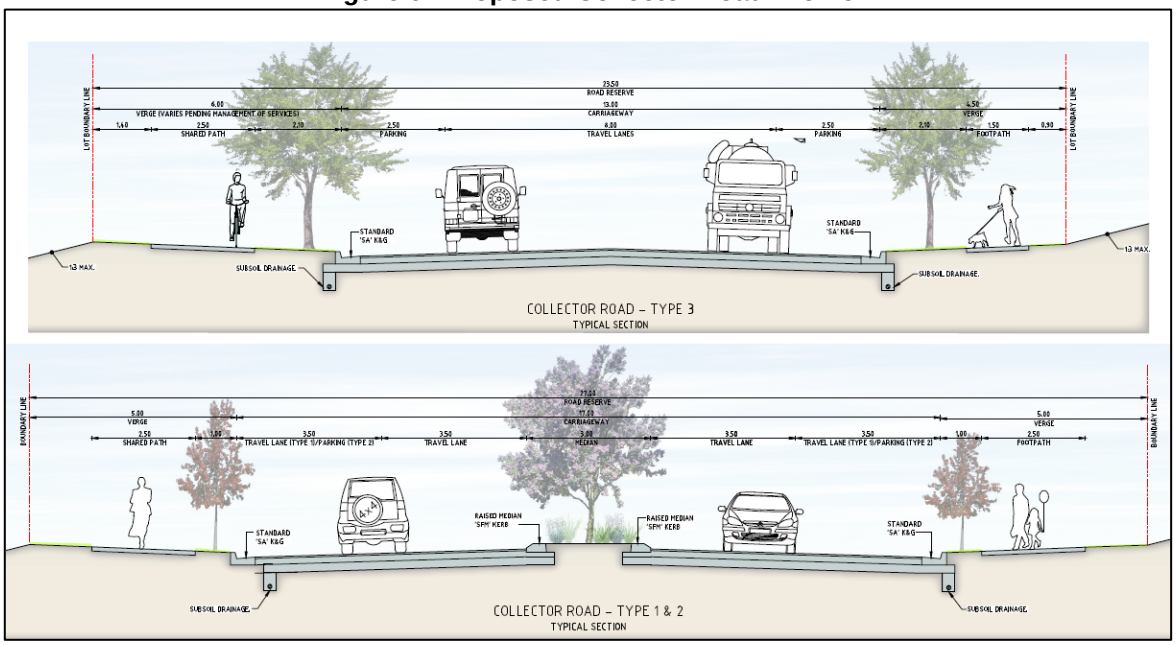
The design remains under development by Northrop Engineers pending alignment adjustments to tie in with the interchange design. Preliminary design for Concept Proposal purposes are provided in **Attachment D**.

3.3.5.4 Proposed Internal Road Profiles

The road hierarchy within the Concept Proposal (see **Figure 59**) comprises the following road profiles:

Collector Roads - an east-west collector road forming a spine to the development, linking Newline Road and the KHURA to the interchange to provide flood free access. Two (2) profiles are proposed to provide both a two(2) and four (4) lane configuration (see **Figure 64**).

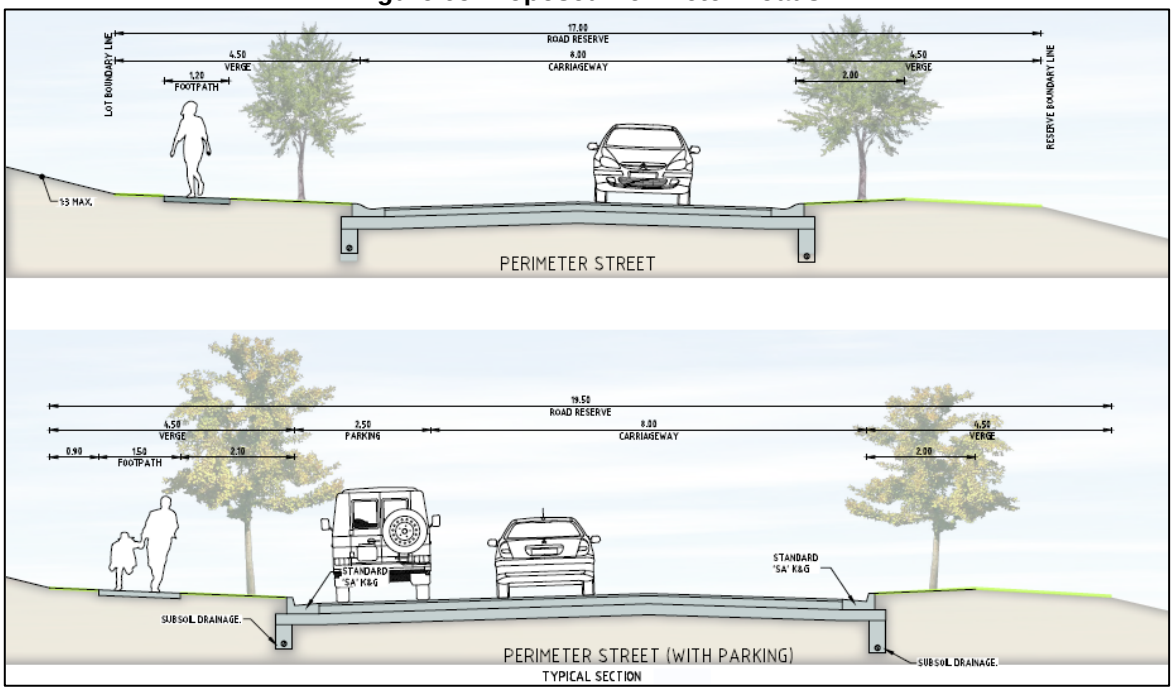
Figure 64 Proposed Collector Road Profile



Source: PDS based on Northrop Engineers

Perimeter Roads – each residential precinct comprises a perimeter road forming a public boundary with the proposed Conservation Area, and forming part of the Bushfire Asset Protection zone along that interface (**Figure 65**).

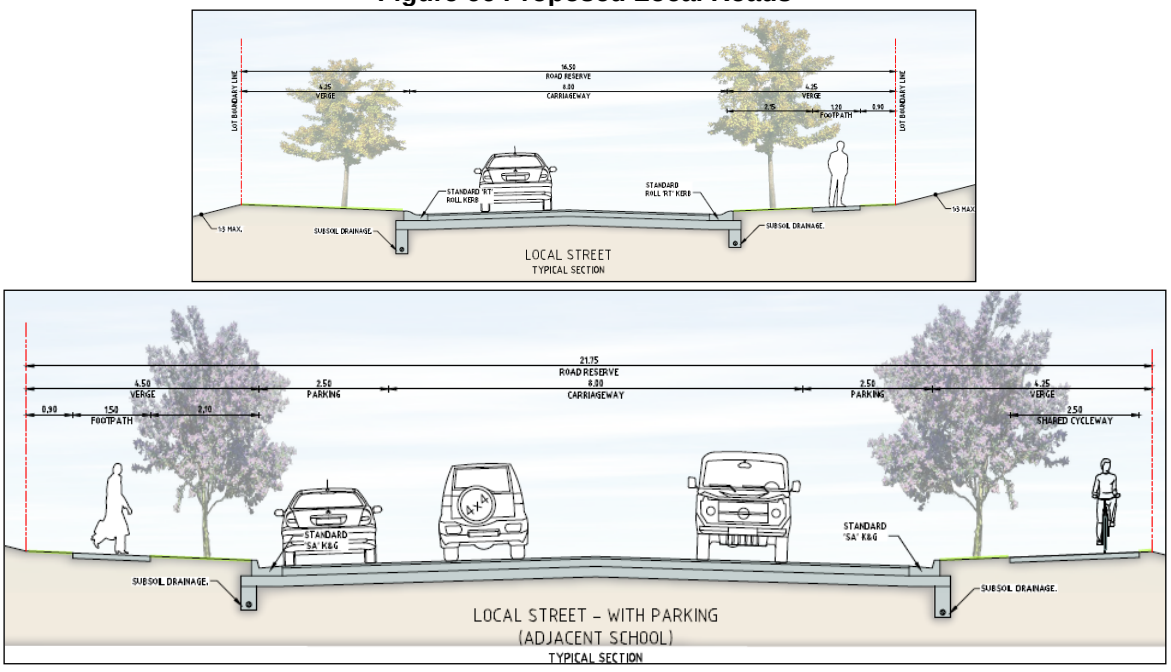
Figure 65 Proposed Perimeter Roads



Source: PDS based on Northrop Engineers

Local Roads – access throughout each precinct is proposed via Local Roads (see **Figures 66**) and Laneways (see **Figure 67)**.

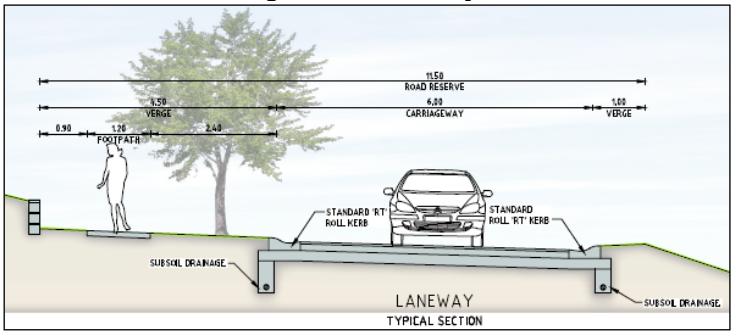
Figure 66 Proposed Local Roads



Source: PDS based on Northrop Engineers

Laneways are intended for areas of excessive grade, to provide lot access to one side of the road only, with a retaining wall or batter on the other side.

Figure 67 Laneways



Source: PDS based on Northrop Engineers

3.3.5.5 Proposed Earthworks

Northrop Engineers have determined during preliminary engineering design (see **Attachment D**) that earthworks and regrading will be required across the majority of the site for the provision of access, drainage and the creation of residential lots. Detailed levels and cut/ fill plans will be confirmed within each DA for subdivision. No earthworks are proposed to enable the Stage 1 site preparation works under this DA.

Preliminary design of roads and drainage indicates that in terms of cut and fill:

- Most roads will involve some adjustment to existing surface levels. It is expected that the roads will vary from either cut or fill and therefore earthworks batters from the edge of the road reserve will extend into adjacent lots by a distance which will be relative to the height of cut or fill at the road centre line. Due to the steep nature of the site, it is expected that retaining walls or vegetated batters with grades up to 1:3 will be required, particularly around the perimeter roads;
- Above ground detention and water quality basins will require adjustments to existing surface levels (both cut and fill) to achieve the necessary embankment heights and floor depths/grades within the basins. Basins will generally be located at the downstream end of each precinct, which typically has flatter grades, so it is possible to minimise batters;
- Development areas along existing watercourses may require filling to ensure building areas are located above the expected 100-year ARI flood level;
- The removal of dams from within the site will require appropriate earthworks to return to the natural or proposed topography;
- Any proposed re-alignments of ephemeral watercourses will require the filling of existing gullies and the creation of new watercourses by cut and fill to achieve the desired cross-sectional shape. Wherever possible, natural stream forms will be adopted, including the provision of pool and riffles, a meandering low flow channel, natural erosion protection (e.g. rock rip rap), the introduction of rock bars at regular intervals to act as bed control structures and dense “three storey” indigenous riparian vegetation planting along the core riparian zones;
- Some filling of development lot areas may occur to smooth out any localised surface high or low points which might affect the development lot. This would assist with ensuring that surface runoff occurs in a sheet flow manner rather than concentrating into small gullies which may produce erosion problems and drainage issues for newly constructed buildings.

3.3.5.6 Proposed Stormwater Management

Northrop Engineers developed a preliminary stormwater management strategy consistent with the *Kings Hill Urban Release Area Water Management Strategy Guidelines by BMT WBM* (dated 16 October 2013) and the PSC DCP, specifically Section D14.D relating to stormwater. The strategy also adopts *Landcom Water's Stretch Targets* in the management of the stormwater impacts of the development on the Irrawang Swamp.

With the ultimate discharge of managed stormwater in to the Irrawang Swamp and Wetland 803, detailed investigation was carried out by Alluvium Pty Ltd to assess the direct and indirect environmental impacts of the discharge on each wetland.

Alluvium's detailed analysis (see Appendix E to Northrop Engineers report **Attachment E**) determined that major risks to the wetlands, including increases in periods of increased inundation depth and reductions in seasonal drying patterns, are unlikely to occur. The report proposes a number of measures are put in place to manage water quantity and quality from development areas, including:

- Reducing stormwater runoff during frequent smaller rainfall events;
- Implement measures including disconnecting impervious areas, oversized BASIX rainwater tanks, infiltrating bio filtration systems, stormwater retention and harvesting systems;
- Ensuring that the majority of future runoff passes through appropriately sized stormwater retention/detention measures to protect ephemeral watercourses from erosion; and
- Management of stormwater runoff quality to prevent coarse sediment, dissolved nutrients, fine sediment and other diffuse source stormwater pollutants from impacting on the wetland ecology. This includes effective measures (including regular inspections) in the subdivision construction, building construction and post development Phases.

These measures have been incorporated into the propose Stormwater Management Plan, which proposed the introduction of a number of stormwater management devices (see **Figures 68 to 70**). These devices include gross pollutant traps, bio-filtration basins, retention basins and detention basins.

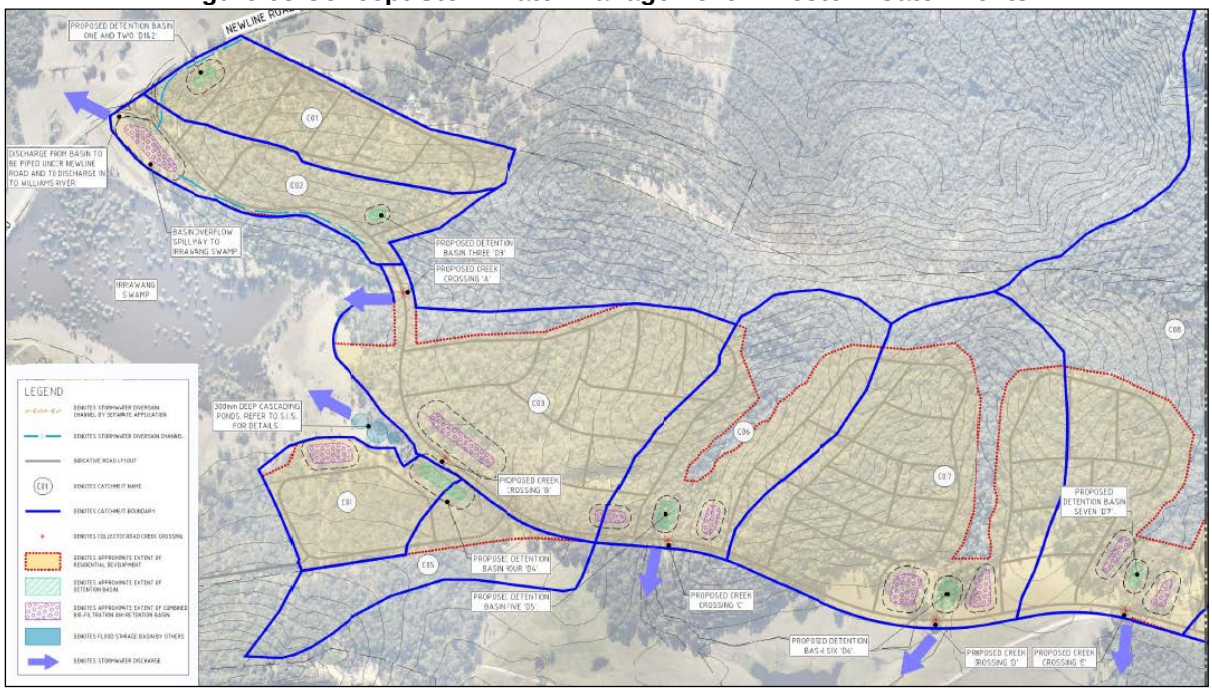
Additional stormwater management options such as vegetated swales, rain gardens integrated into the streetscape, wetlands and proprietary products used for conveyance and treatment may also be considered on a site by site basis at DA for subdivision stage.

Management of Water Quantity
Detention basins are proposed at 12 different locations across the site. Five (5) of the 12 proposed detention basins will be offline (not within a classified watercourse), while seven will be online (within a classified watercourse). Online detention basins are proposed to be located along 1st and 2nd order streams within the site boundary which is allowable in accordance with the NSW Guidelines for Riparian Corridors on Waterfront Land, 2012.

Management of Water Quality

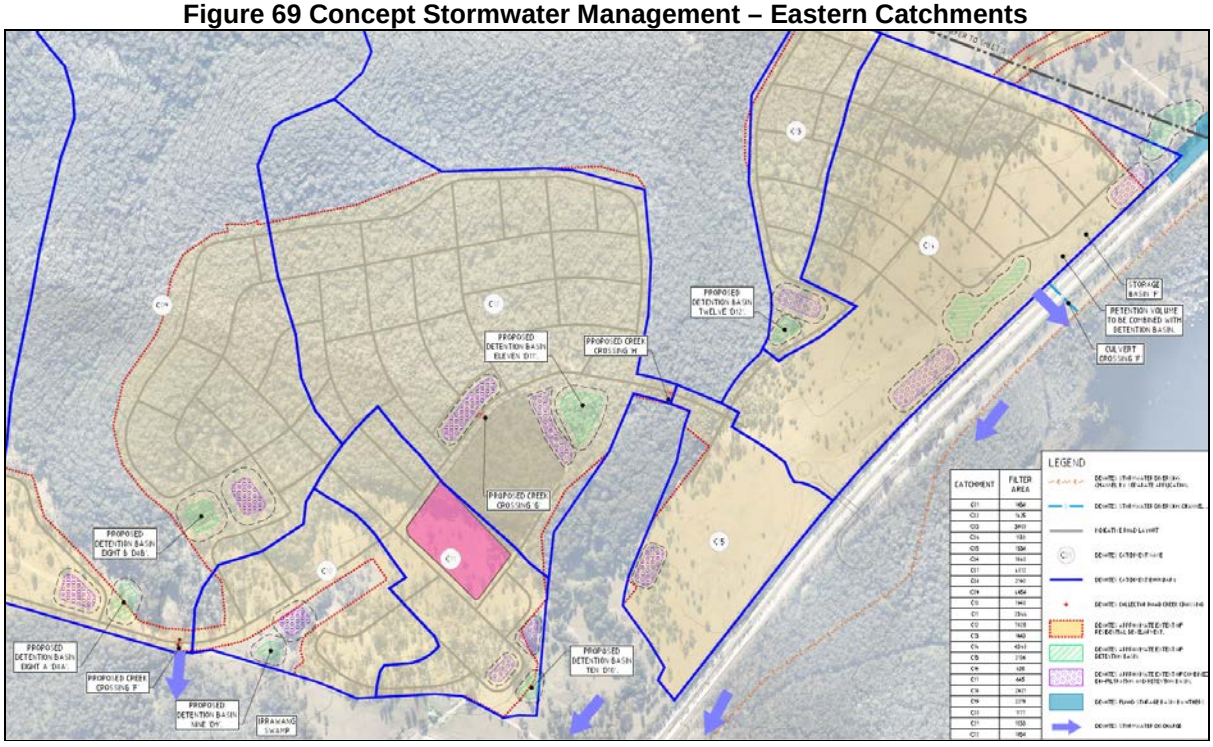
Northrop determined that bio-filtration basins in combination with Gross Pollutant Traps (GPTs) are the most efficient and economical treatment devices for the Kings Hill development at a precinct scale. Rain water tanks at a lot scale have also been included as the first step in the treatment train. Preliminary Stormwater Management design for the Proposal is depicted in **Figures 68 to 70**.

Figure 68 Concept Stormwater Management – Western Catchments



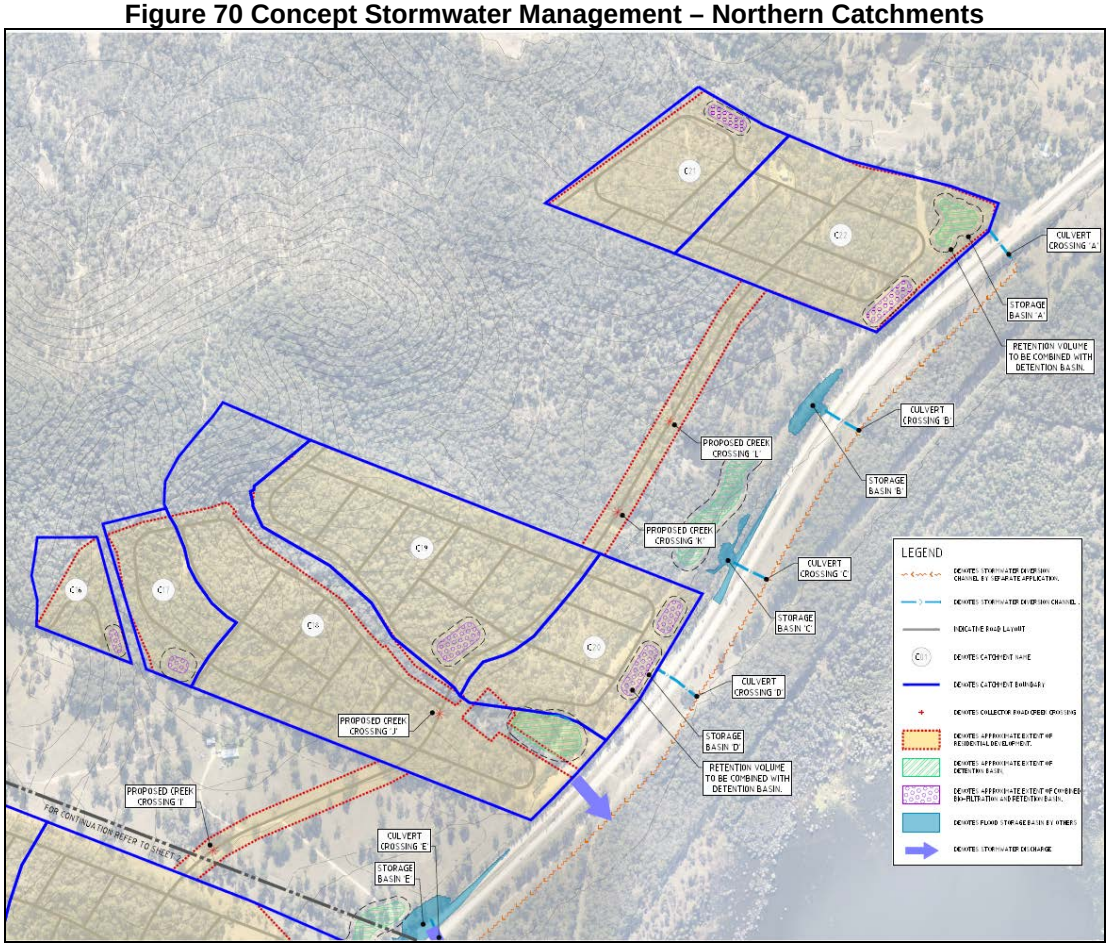
Source: Northrop Engineers

Figure 69 Concept Stormwater Management – Eastern Catchments



Source: Northrop Engineers

Figure 70 Concept Stormwater Management – Northern Catchments



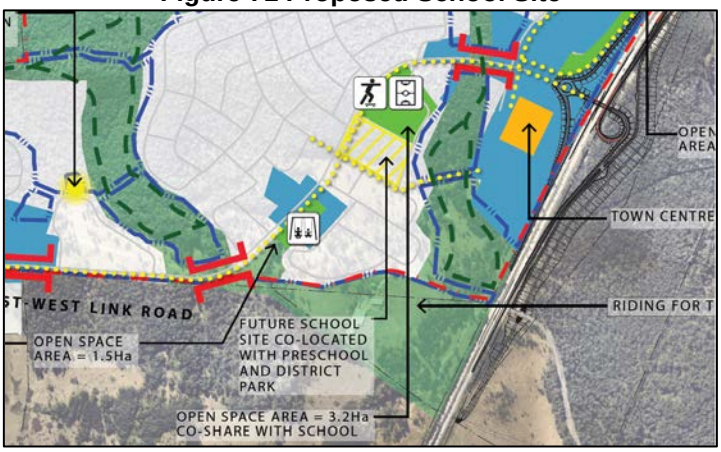
Source: Northrop Engineers

3.3.5.7 Proposed School Site

A state Primary School site is proposed in a location collocated with proposed open space with capacity for fields (see **Figures 71**).

Demand for the primary school is based on the ultimate expected population of 10,000 persons within the KHURA. Under the State VPA, an unconstrained and serviced school site is to be dedicated to the NSW Department of Education prior to the issue of a subdivision certificate for the creation of the 900th lot within the KHURA.

Figure 71 Proposed School Site



Source: PDS

Based on information available at the Concept Proposal stage, the proposed school site meets or exceeds the criteria for public school sites (determined during consultation with the NSW Department of Education) and the site and location criteria (where specified) in the following:

- *Planning New Schools School Safety and Urban Planning Advisory Guidelines* (Sept 2016).
- State Environmental Planning Policy (Educational Establishments and Child Care Facilities) 2017; and
- Schedule 5 of the State VPA executed between KHD, DPIE and the RMS (now TfNSW).

The NSW Department of Education require Primary School sites to comprise a usable site area of 2ha with a maximum of 3ha on Greenfield sites or in regional areas. The site is 2.1ha and meets the following site criteria of the NSW Department of Education:

- Site must be substantially regular with have a minimum frontage of 200m and road frontage ideally on 3 but not less than 2 sides;
- Site must be located near land adjacent open space and recreation on land with less than 1 in 10 slope and with consistent topography and well drained;
- Site must be clear of 1 in 100 year flood risk and be free of contamination, and be provided with suitable bushfire measures, if mapped as bushfire prone land; and
- Site must be properly serviced with water, sewer, power, telecommunications, local traffic infrastructure (such as kerb, gutter, footpath, roundabout, crossings, pedestrian pathways).

4.0 STATEMENT OF ENVIRONMENTAL EFFECTS

This Statement of Environmental Effect is provided in accordance with Schedule 1, Part 1, s.2 (4) of the Environmental Planning and Assessment Regulation 2000. It is provided to facilitate assessment of the relevant issues in accordance with section 4.15 of the Environmental Planning and Assessment Act, 1979 under **Section 5.0**.

4.1 Previous and Present Site Uses

Historical land use over many decades is characterised by rural activity, namely livestock agriculture along with resource extraction in the form of timber getting and quarrying of gravel. These activities created many of the disturbances still evident on the site, including modified areas and stands of vegetation, weed invasion, borrow pits, fencing, dams and extensive tracks and trails.

There is no current use of the land other than grazing and ongoing rural activates. The previous uses of the land have no impact on the Concept Proposal.

4.2 Aboriginal Archaeology

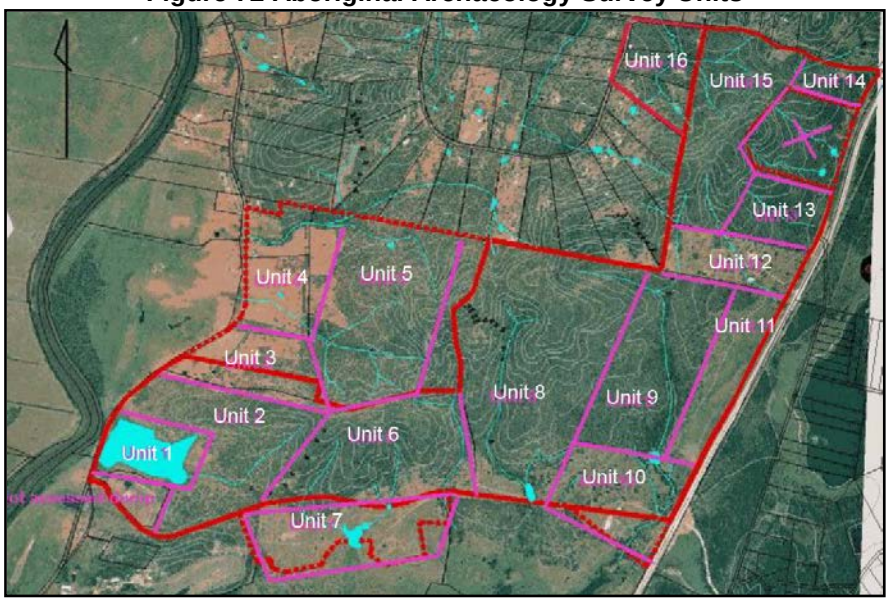
Myall Coast Archaeological Services undertook archaeological investigations of the Kings Hill Urban Release Area to support the rezoning for the site (**Attachment K**).

The survey, undertaken in conjunction with representatives of the Worimi Local Aboriginal Land Council, was based on the 'Predictive Landscape Model', which examines the landscape, ethnohistory, topography and mapping to predict the likelihood of archaeological evidence being found in the study area. Fieldwork was then undertaken to test the prediction.

The investigation identified 16 survey units across the URA with the Concept Proposal involving land in units 1, 2, 6, 7, 8, 9, 10, 11, 13, 13, 14 and 15 (see **Figure 72**).

No artefactual evidence was found in the study area. The drainage lines, trails and exposed areas were carefully examined. Nothing was revealed during the geotechnical analysis.

Figure 72 Aboriginal Archaeology Survey Units



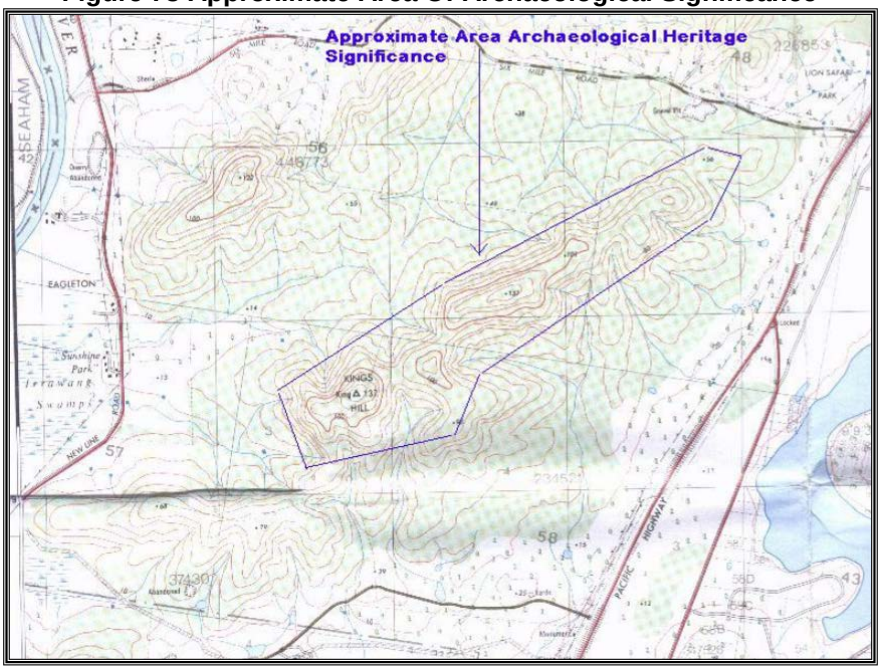
Source: Myall Coast Archaeological Services

The results for each Survey Unit are contained in **Table 12**.

The assessment notes that the upper ridge and slopes of Unit 8 contain caves, ceremonial grounds and a walking track which are of archaeological heritage significance to the Worimi. More recent hi-resolution air photos depict these landscape features also within Unit 5 (adjoining land) and Unit 6.

The archaeological assessment recommends that Kings Hill, the associated ridgeline, the caves and rock outcrops be recognised as being of aboriginal cultural significance, and considered for inclusion in a management plan. The report also recommends that the areas be excluded from development to allow further cultural and archaeological research. The area of significance is mapped in **Figure 73**.

Figure 73 Approximate Area Of Archaeological Significance



Source: Myall Coast Archaeological Services

The area of significance nor its features are listed as heritage items within the Port Stephens Local Environmental Plan (2013). There is also no listing on the State Heritage Inventory, the Register of the National Estate or the National Trust Register. Additionally, the area of significance involves other land within the KHURA, and land outside of the KHURA.

Nonetheless, to the extent that the elevated area involves KHD's land, the land is zoned E2 Conservation and falls within the proposed Conservation Area to be managed in-perpetuity. Consequently, the Concept Proposal is unlikely to result in any adverse physical or indirect impact upon the identified significance and is more likely to benefit from the proposed Biodiversity Management Plan measures to control pest and weeds, and restore the native vegetation.

Table 12 Survey Units

Unit	Topography	Surface slopes	Geology & Soils	Drainage	Survey Constraints	Visibility	Finds
1 Riverine Wetlands	Inundated wetlands or billabong. Some dead trees in water. Isolated trees around margin. Pasture on margins	Flat low lying	Unknown. Open water	Drains westerly to river but is a holding catchment	Inundation and pasture cover	poor	nil
2 Western slopes	Pasture with tree cover. Previously cleared paddock with regrowth over the past 30 years. Eucalypt forest with moderately dense undergrowth	<10%	Carboniferous deep alluvial soils	Some deep incised gullies to river and wetlands. Intermittent stream	Vegetation cover	fair	nil
3 River flats	Pasture sparse tree cover	Flats with moderate slope <5%	Carboniferous deep alluvial soils	Shallow pastured drainage channels	pasture	good	nil
4 River Flats	Pasture sparse tree cover	Flats with moderate slope <5%	Carboniferous deep alluvial soils	Shallow pastured drainage channels.	pasture	good	nil
5 Hill Slopes	Eucalypt forest with dense understorey of native and introduced species	Upper Slopes from 10-20%	Carboniferous shallow soils	Some deep incised gullies with creeks	Vegetation cover	Fair to very good particularly in gullies	nil
6 Ridge and slopes	Upper hill slopes that includes areas exceeding 4h: 1v. Eucalypt forest with moderately dense understorey and also areas of mesic understorey. Some areas of pasture. Lantana	10 – 50%	Carboniferous with rock outcrops and shallow soils	Several deep rocky gullies intermittent water flow with some long lasting waterholes	Vegetation, steep slope	Very good in parts particularly creeks and gullies. Poor in parts.	nil
7 Southern flats	Lower slopes and flats containing man made water bodies. Intermittent creek.	<5% to flat	Quartenary deep soils	Swampy, low lying poor drainage	pasture	Fair to good	nil
8 Ridge, slopes and plateaus	Upper hill slopes, ridge and plateaus. Rock exposure tracks cattle and man made. Poor tree cover on ridge. Lantana prolific	Exceedingly steep to flat gradual sloping ridgeline	Carboniferous Very shallow soils	Low water holding capacity some rock pools deep incised rock gullies and cliff faces. Fast runoff	Lantana, slope vegetation	Excellent in parts, rock outcrops very poor in other due to lantana	Caves, ceremonial grounds. Walking track
9 Hill slopes	Eucalypt forest with moderate to open understorey of native and introduced species	Upper Slopes from 5 - 15%	Carboniferous shallow soils with areas of deeper soils	Some gullies with creeks generally not eroded	Vegetation cover	good particularly in gullies	nil
10 South Western Flats	Pasture with sparse tree cover	5%	Permian soil depth variable but generally deep	Low lying creek lines pastured localised runoff. Soil has water holding capacity	pasture	Generally good	nil
11 Western flats	Pasture with sparse tree cover	5%	Permian soil depth variable but generally deep	Low lying creek lines pastured localised runoff. Soil has water holding capacity	pasture	Generally good	nil
12 Slopes flats	Pasture with sparse tree cover Altered terrain	>10% to flat. Rolling hills	Permian and Carboniferous soil depth variable but generally deep	Low lying creek lines pastured localised runoff. Soil has water holding capacity	Pasture and disturbed worked areas of small farm holding	Generally good	nil
13 slopes and gully	Upper hill slopes and lower slopes. Eucalypt forest with moderately dense understorey. Some areas of pasture. Lantana	20 – 10%	Carboniferous with some Permian soil depth variable but generally shallow	Gully run off to the east inhibited by highway	Vegetation disturbed logging areas	fair	nil
14 Slopes	Eucalypt forest open understorey. Logging trails and dumps. Altered terrain	<15%	Carboniferous soil depth variable	Localised drainage generally to the east Shallow pastured gullies	Altered terrain	good	nil
15 Slopes and ridge	Eucalypt forest with open to dense understorey. Logging still evident. Eroded trails and tracks. rock outcrops	Variable from flat to very steep	Carboniferous soil depth variable	Low water holding capacity some deep incised rock gullies and cliff faces. Fast runoff in places	Vegetation, slope and altered terrain	Fair to good	Walking track connecting to unit 8. Archaeological potential
16 Northern Slopes	Eucalypt forest with open to dense understorey. Eroded trails and tracks. Altered terrain. quarry	<10%	Carboniferous soil depth variable but generally shallow	Creek bisects unit from south to north Runoff to north and east	Altered terrain	good	nil

Source: Myall Coast Archaeological Services

The applicant is aware of their ongoing responsibilities under the Aboriginal Heritage Due Diligence Code of Conduct and the National Parks and Wildlife Act. Should any potential items be observed during construction, the applicant must stop work and notify BCD.

4.3 Geotechnical Environment

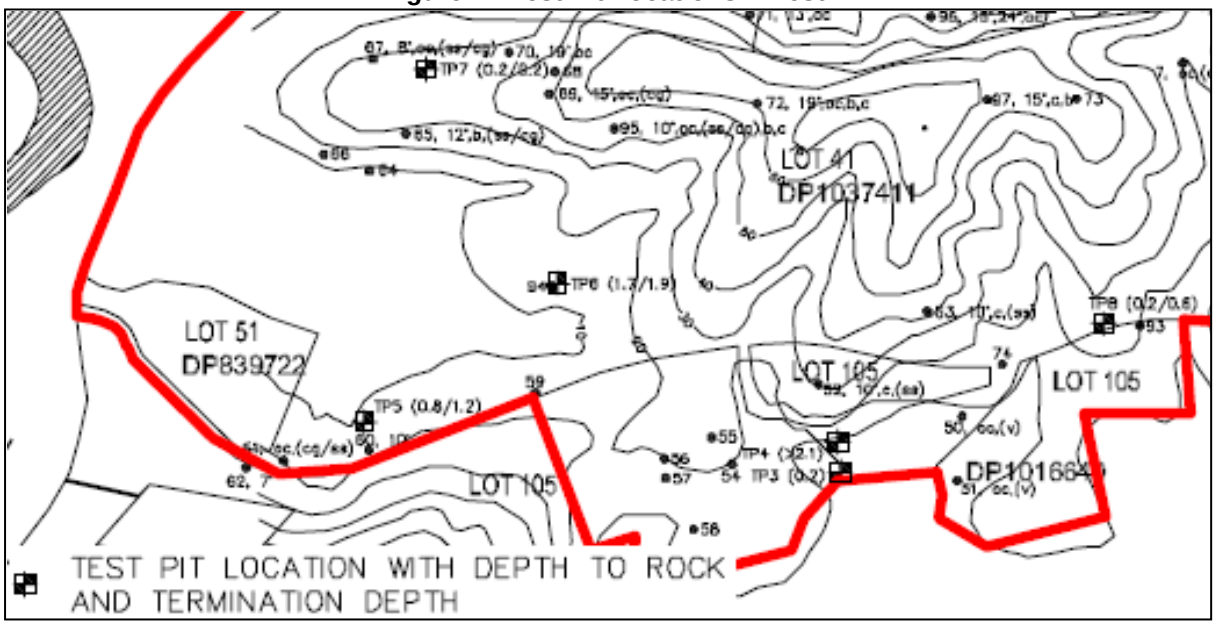
A geotechnical assessment to support the rezoning of the KHURA was carried out by **Douglas Partners Pty Ltd** (**Attachment J**).

The purpose of the investigation was to provide site specific information to identify possible constraints and opportunities to development including; slope stability; soil erosion/dispersion conditions; foundation conditions; acid sulphate soils; salinity; potential site contamination.

4.3.1 Urban Capability

Test pit excavation was carried out at 22 locations across the KHURA, of which 18 are relevant to the site (refer **Table 13, 14 and 15** and **Figure 74, 75 and 76**). The pits were set out and logged by a geotechnical engineer.

Figure 74 Test Pit Locations - West



Source: Douglas Partners

Table 13 Test Pit Results - West

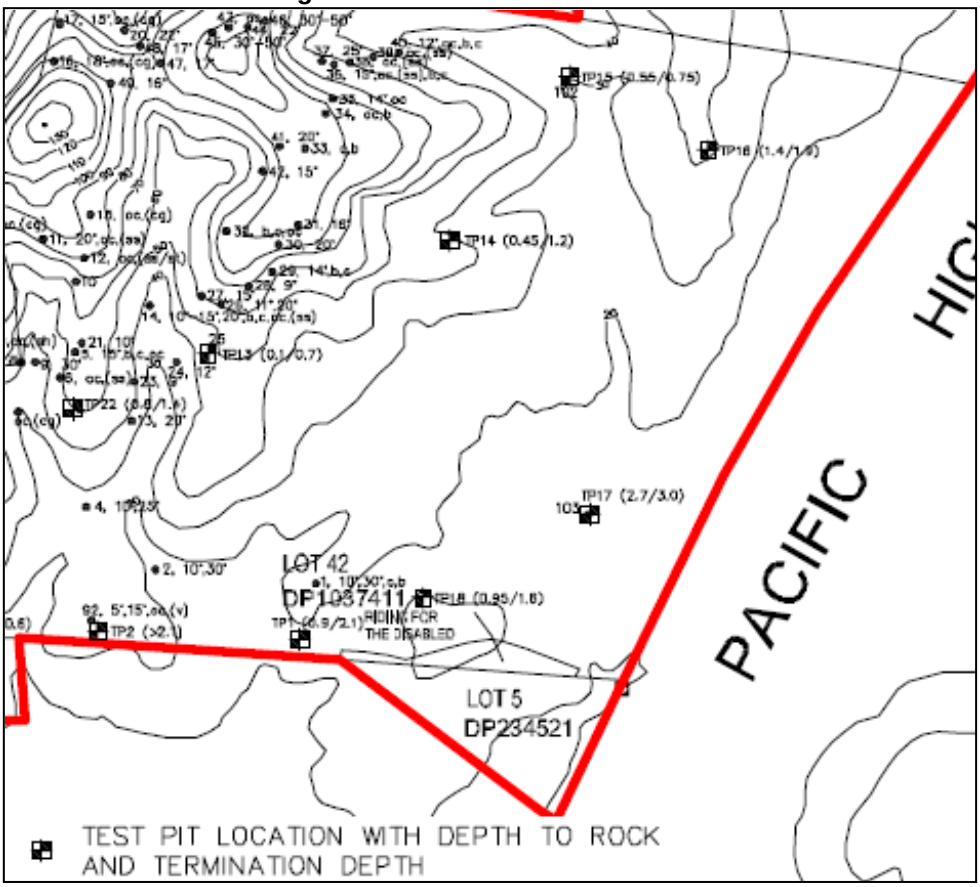
Test Pit	Depth To Rock/Backhoe Refusal Depth (m)
3	0.2/0.4
4	>2.1
5	0.8/1.2
6	1.7/1.9
7	0.2/0.2

Source: Douglas Partners

The subsurface conditions in the lower slopes had a variable soil depth. On lower slopes with soil depth from 0m to >2m depth, soil composition generally comprise near surface silt/sand overlying clays, overlying a variety of rock types. On upper slopes, spur lines, hill crests with shallow to no soil cover (less than 1 metre), soils generally sandy and silty overlying predominately sandstone and conglomerate.

Heavy ripping or blasting may be required for excavation below backhoe refusal depths, and would depend on jointing and fracturing. Excavation conditions for each stage of the development need to be confirmed.

Figure 75 Test Pit Locations - East



Source: Douglas Partners

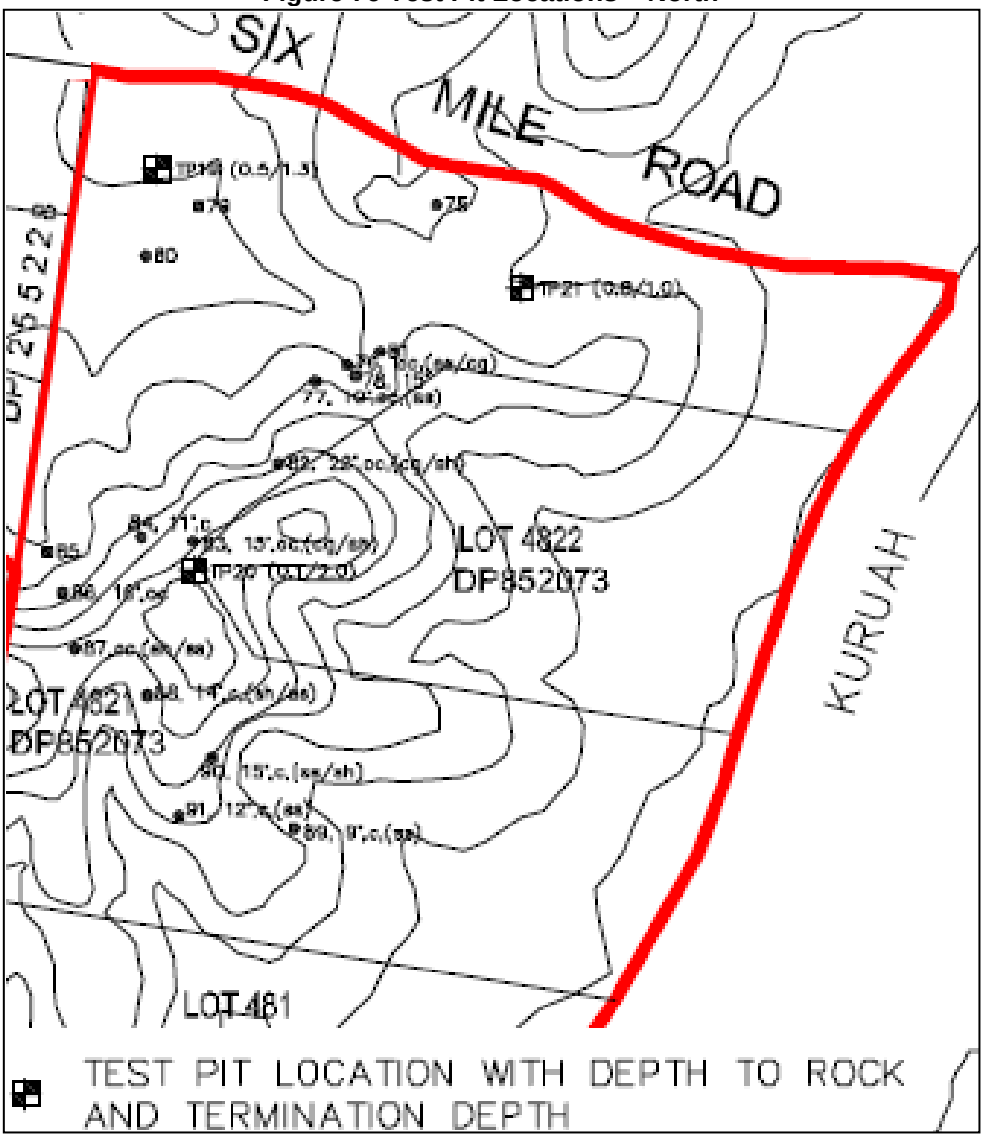
Table 14 Test Pit Results - East

Test Pit	Depth To Rock/Backhoe Refusal Depth (m)
1	0.9/>2.1
2	>2.1
8	0.2/0.6
13	0.1/0.7
14	0.45/1.2
15	0.55/0.75
16	1.4/1.9
17	2.7/>3
18	0.95/1.6 (slow dig)
22	0.8/1.4

Source: Douglas Partners

The clay soils were generally observed to be reactive. Appropriate investigation and laboratory testing would be required to address clay reactivity and confirm foundation classification, prior to construction of each stage of residential development.

Figure 76 Test Pit Locations – North



Source: Douglas Partners

Table 15 Test Pit Results - North

Test Pit	Depth To Rock/Backhoe Refusal Depth (m)
19	0.5/1.3 (slow dig)
20	0.1/2.0 (slow dig)
21	0.8/1.0 (slow dig)

Source: Douglas Partners

4.3.2 Slope Stability

No overt signs of deep seated instability were observed during the field investigation. The following are recommended concerning slope for urban purposes:

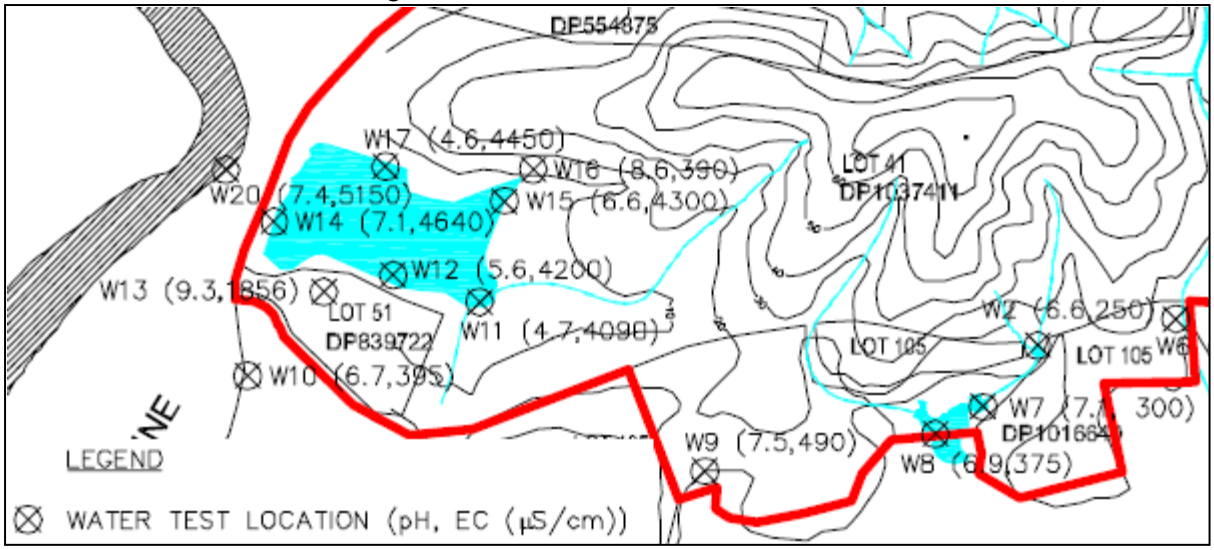
- Restrict development in steep areas with slopes in excess of 4H:1V (>25% or >14 degrees), without specific geotechnical investigation. Development in these areas could be considered, but will require site specific assessment.
- Undertake investigation/inspection upslope of development areas to identify cobbles/boulder which could become detached, and undertake appropriate remedial action (i.e. remove/reshape boulders).
- Undertake specific geotechnical investigation for development requiring cutting and/or filling in all areas, recommending appropriate restrictions and/or remedial measures.
- Specific investigations should be undertaken where dams are present to assess integrity and long term stability and remedial works where dams are likely to be retained.

4.3.3 Salinity

The site is not located within a saline catchment.

Preliminary in-situ test of selected surface waters generally indicated that dams within the site contained neutral, fresh surface waters (see **Figures 77 and 78** and **Table 16**).

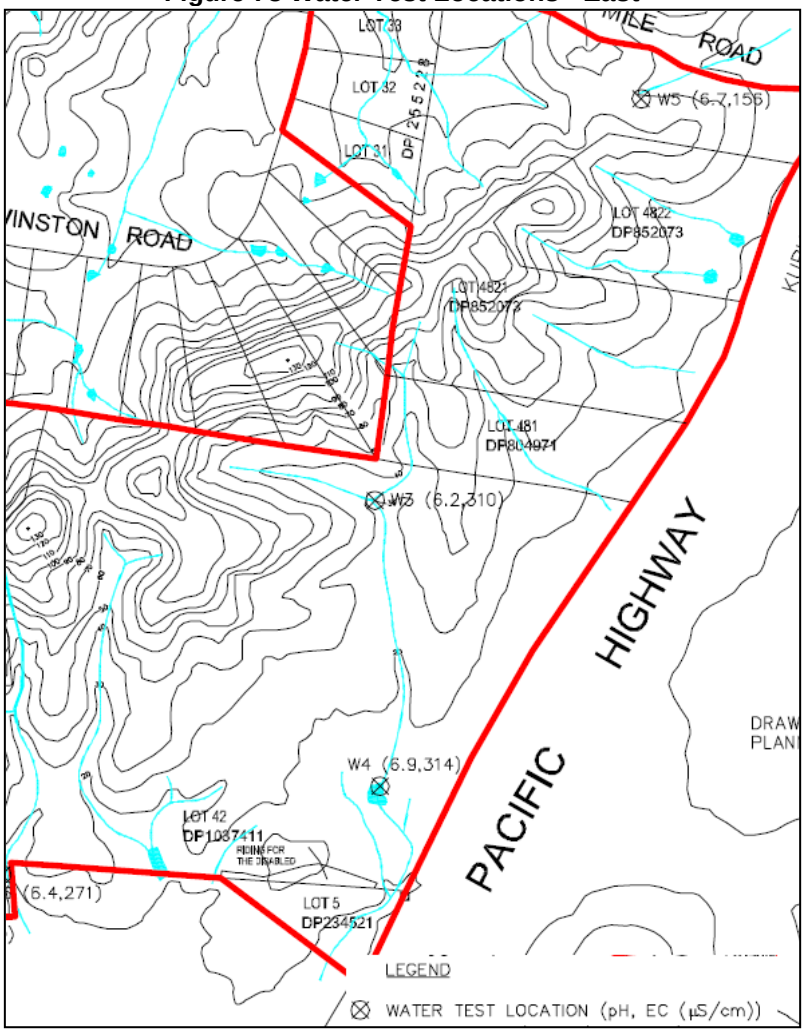
Figure 77 Water Test Locations - West



Source: Douglas Partners

The results indicate that subject to appropriate management of erosion and runoff, development is unlikely to result in increased salinity.

Figure 78 Water Test Locations - East



Source: Douglas Partners

Table 16 Surface Water pH & Electrical Conductivity

Sample	Location (1)	PH	EC (µS/cm)
W1	Dam	6.5	400
W2	Dam	6.6	250
W3	Dam near Pit 15	6.2	310
W4	Dam	6.9	314
W5	Dam	6.7	156
W6	Dam	6.4	271
W7	Dam	7.1	300
W8	Dam	6.9	375
W9	Dam	7.5	490
W10	Dam downstream of landfill	6.4	395
W11	Swamp/Wetland	4.7	4090
W12	Swamp/Wetland	5.6	4200
W13	Leachate dam	9.3	1850
W14	Swamp/Wetland	7.1	4640
W15	Swamp/Wetland	6.6	4300
W16	Dam immediately upstream of swamp	8.6	390
W17	Swamp/Wetland	4.6	4450
W18	Dam	7.5	250
W19	Dam	7.2	275
W20	Williams River	7.4	5150

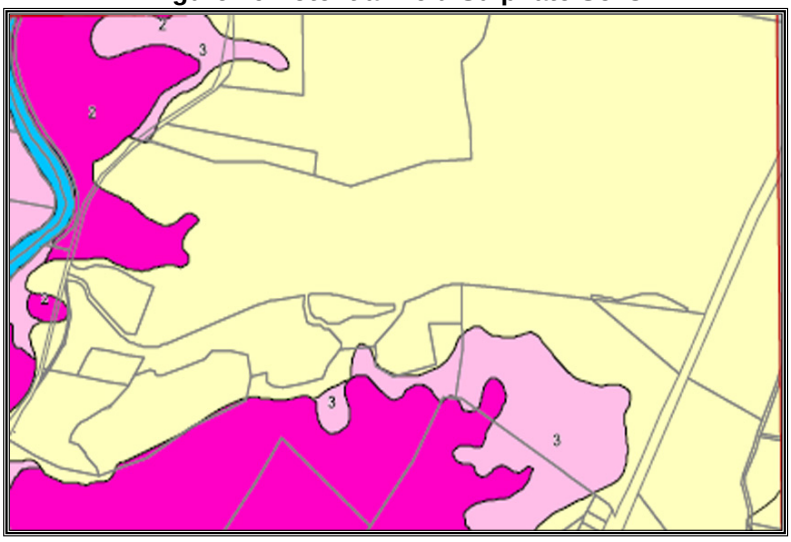
Source: Douglas Partners

4.3.4 Acid Sulphate Soils

The Karuah and Maitland Acid Sulphate Soil Risk indicate that acid sulphate soils are likely to be present within 1m of the ground surface on the western side of KHURA.

Figure 79 depicts the site relative to the acid sulphate soil mapping in the LEP 2013 (Class 5) and confirms that the risk of acid sulphate soils being encountered during construction is low.

Figure 79 Potential Acid Sulphate Soils



Source: PSC LEP 2013

4.3.5 Erodibility and Dispersion

The soil landscape map indicates that the site contains soils with a “high water erosion hazard”. Near surface silts/sands were found within test pits which confirmed the presence of erodible soils. Localised erosion of surface soils is common where vegetation is sparse. These soils are readily amenable to standard mitigation measures to address the potential for erosion during and following construction.

The results of Emerson Class soil testing (see **Table 17**) indicate that the site soils are generally non-dispersive. Detailed investigation would be recommended to further assess the presence and extent of partially dispersive soils. Appropriate mitigation measures will be required during and following development to address soil dispersion if identified in specific areas.

Table 17 Emerson Class Test Results

Sample No	Depth (m)	Description	Emerson Class No.
TP 1	0.5	Yellow-brown silty sandy clay	5
TP 4	0.5	Grey-brown clay some sand	6
TP 5	0.4	Grey-brown clay some sand/gravel	5
TP 9	0.2	Light brown-grey sandy silty clay/clayey sandy silt	8
TP 12	0.7	Brown mottled orange sandy clay	3
TP 15	0.4	Grey-brown mottled orange clay with some silt/sand	5
TP 16	0.5	Red-brown clay trace iron-cemented gravel	6
TP 17	0.4	Brown-grey clay with some silt	5
TP 19	0.3	Light brown mottled orange silty clay some sand	5
TP 22	0.5	Light grey sandy silty clay/clayey silt with some siltstone gravel	5

Source: Douglas Partners

4.3.6 Erosion and Sediment Control

Northrop Engineers (see **Attachment E**) has considered the potential for erosion given the Concept Proposal involves clearing and initial site preparation works under Stage 1.

The site contains numerous tributaries of Grahamstown Dam and Irrawang Swamp, and the prevention of sediment and other pollutants entering into this system is an important consideration during construction. Sediment runoff is considered a significant contributor to high nutrient levels in wet weather conditions. These elevated nutrient levels often promote excessive growth of algae which can release toxic compounds into the water killing aquatic organisms as well as restricting fish migration, fishing and recreational activities. The direct build-up of sediment in creeks also has several negative impacts on aquatic plant and fish life, as well as reducing the storage and conveyance properties of the watercourse.

Water quality and soil erosion control are a primary consideration during clearing and construction activities, with the design and implementation of detailed Sediment and Erosion Control Plans or Water and Soil Management Plan to be a pre-condition to works commencing on site.

Northrop advise that various best practice guidelines exist to assist in preparing management plans for water quality and erosion control, such as *Managing Urban Stormwater: Soils and Construction, Volume 1* (Landcom 4th Edition, reprinted 2006) and *Volume 2* (DECCW 2008).

There are also several pieces of legislation which may need to be considered in the preparation and implementation of appropriate construction water quality and erosion control measures, such as;

- Protection of the Environment Operations Act 1997;
- Fisheries Management Act 1994;
- Soil Conservation Act 1938; and
- Water Management Act 2000.

The above referenced documents should inform the preparation of a Precinct specific erosion and sediment control plan. As a minimum, key measures to be included are:

- A Soil and Water Management Plan shall be implemented prior to Stage 1 works or site disturbance commencing on the site. All subdivision works and construction activities are to be undertaken in accordance with the approvaled soil and water management plan;
- Regular inspections and maintenance of erosion and sediment controls;
- Maximise the retention of riparian and mature native or threatened vegetation;
- Frequent monitoring of turbidity downstream of the construction works;
- Creation of designated no-go areas to minimise site disturbance;
- Minimise areas of earthworks or trenches open at any one time;
- Progressive revegetation of disturbed areas;
- Regular cleaning of public roads which are used by construction traffic; and
- Construction of temporary surface drains to minimise the flow of clean runoff into the construction site. Where possible, surface flows should also be directed away from material stockpiles and open trenches.

4.4 Mine Subsidence

The site is not located within a Mine Subsidence District.

4.5 Contamination Assessment

In conjunction with the geotechnical assessment, a preliminary contamination assessment was conducted in 2005 to inform the rezoning of the KHURA and consideration under SEPP 55.

The assessment comprised the following:

- review available historical information provided by Myall Coast Archaeology Pty Ltd;
- searches and discussions with Port Stephens Council (PSC);
- searches with the Environmental Protection Authority (EPA);
- searches with the Department of Land and Water Conservation (DLWC);
- brief site visit by an environmental engineer.

Discussions with Myall Coast Archaeology Pty Ltd
Mr Len Roberts of Myall Coast Archaeology indicated that past land use in the vicinity of the URA was likely to include grazing, timber production, and small scale orchards, vineyards, quarrying and dairying for various lengths of time and success. The exact locations of the above land uses, however, are difficult to establish. Mr Roberts also indicated that the URA was likely to be outside the early Raymond Terrace farming areas.

Discussion with PSC
A search of PSC records did not indicate any DA/BAs approved on the site.

Discussion with DLWC (now NSW Office of Water)
A groundwater bore search undertaken by the DLWC indicated that a registered groundwater well is located within Lot 32, DP 255228 (a lot off Winston Close) which is used for domestic and stock purposes. The next nearest registered groundwater well is located approximately 3 km south of the site (GW 057239) and is used for domestic purposes.

Observations relating to potential site contamination that are relevant to the subject site are:

- presence of former Council landfill immediately adjacent to the swamp/wetland over the south-west corner of the site;
- quarry within the northern portion of the site.

On the basis of the available KHURA history, the observations made during the original site inspection, and more recent site inspections during DA preparations by JW Planning Pty Ltd, there is no evidence to suggest there is potential contamination sources on the site that would preclude development of a kind proposed within the Concept Proposal.

4.6 Ecological Environment

The Concept Proposal is accompanied by a Species Impact Statement prepared by RPS Group.

The information in this section is a fundamental component of the Concept Proposal and the recommended approach to carrying out development of the land. Consequently, full details of the approach and the measures adopted are presented in the description of the site and in the description of the Proposal in **Section 2.4**, **Section 3.1** and **Section 3.2**. This section provides a summary of those details based on extracts of that information.

4.6.1 Existing Environment

The Concept Proposal involves land generally disturbed by a history of logging and quarrying, and in more recent times, the land has become disturbed by weed and pest invasion associated with a long history of grazing activities under the former rural zone (which continue today under existing use rights).

In terms of mapped habitat, the NSW Department of Primary Industries *Key Fish Habitat* Map identifies the following areas of fish habitat within or near to the site:

- the south eastern corner of the subject site;
- the Williams River and wetland adjacent to Newline Road;
- a small area central to the Irrawang Swamp to which the development drains.

4.6.2 Site Assessment History

The Concept Proposal represents the culmination of extensive environmental and ecological assessments over a 16 year period, commencing with the start of the rezoning process in 2003.

Seldom are development sites able to be informed by such an extensive period of ecological research data to inform habitat usage, species populations and fauna behaviours. And despite the rapid changes in environmental policies and the methodologies for data collection since 2003, the biodiversity values for the site have remained relatively consistent, providing a high level of confidence in the data.

Site investigations since the land was rezoned in 2010, including preparation of an SIS by RPS Group (see **Attachment H**) during 2018 and 2019, have nonetheless provided an improved and contemporary understanding of biodiversity values. Consistent with the specification of the CERs, the SIS obtained data that has enabled the development of a Concept Proposal that is based on the modern biodiversity principle of avoid, minimise and mitigate; a principle that did not exist when the land was rezoned to enable urban development.

Additionally, the adoption of this principle along with the use of modern and more accurate data collection methods (e.g. data collection enabled by Koala detection dogs) has assisted in the refinement of the Concept Proposal to meet or exceed the objectives set by Ecobiological in their review of the zoning scheme commissioned by Council in 2009.

That review identified four (4) key environmental outcomes that future Development Applications ought to achieve within the KHURA:

- Establish corridor zones of 100-150 m widths;
- Retain additional preferred Koala habitat along the western ridge;
- Avoid as far as possible areas of high-value Brush-tailed Phascogale habitat and known Grey-crowned Babbler breeding areas; and
- Avoid the removal of Freshwater Wetland habitat within three key wetland locations.

The 2009 Ecobilogical assessment and its recommendations were endorsed by the OEH (in a letter to Council endorsing the rezoning of the land) as a basis for future biodiversity assessments at DA stage.

4.6.3 Evaluation of Existing Zones

As discussed in **Section 2.4**, Ecobiological identified areas within the KHURA where land uses within an urban zone could potentially result in a significant impact on the certain threatened species or their habitat. To inform and respond to Ecobiological's recommendations, and to inform the Development Application process as to whether a significant impact is likely, the Chief Executive Requirements (CERs) for the preparation of a Species Impact Statement (SIS) were obtained from the NSW Office of Environment and Heritage in 2017, and updated in 2018.

The SIS provided a means to re-evaluate the site and refine the approach to development and conservation with a view to not causing a significant impact, and to ensure conservation outcomes that align with those recommended by Ecobiological.

A key objective of the SIS was therefore to determine how the Proposal can deliver the zone based land use expectations of the KHURA without having a significant impact on threatened species and ecological communities on the site. In turn, extensive site investigations were carried out in accordance with the CERs to determine how the principle of avoid, minimise and mitigate ought to be adopted by the Proposal to achieve that objective.

4.6.4 Avoiding a Significant Impact

The recommendations of the SIS are that to avoid a significant impact on threatened species and ecological communities on the site, the Proposal ought to adopt the following principles, notwithstanding the existing land use zones gazetted in 2010:

1. Define an area suitable for the long term sustainable conservation of local biodiversity values (a conservation area) and apply the necessary establishment works required to retain these values over the long term;
2. Define an appropriate management regime that minimises the impact of the proposal where the clearing of vegetation and habitat is involved; and
3. Provide security for the long term protection of local biodiversity values through the use of an appropriate conservation mechanism that provides in-perpetuity conservation inclusive of ongoing funded management regimes (i.e. VPA).

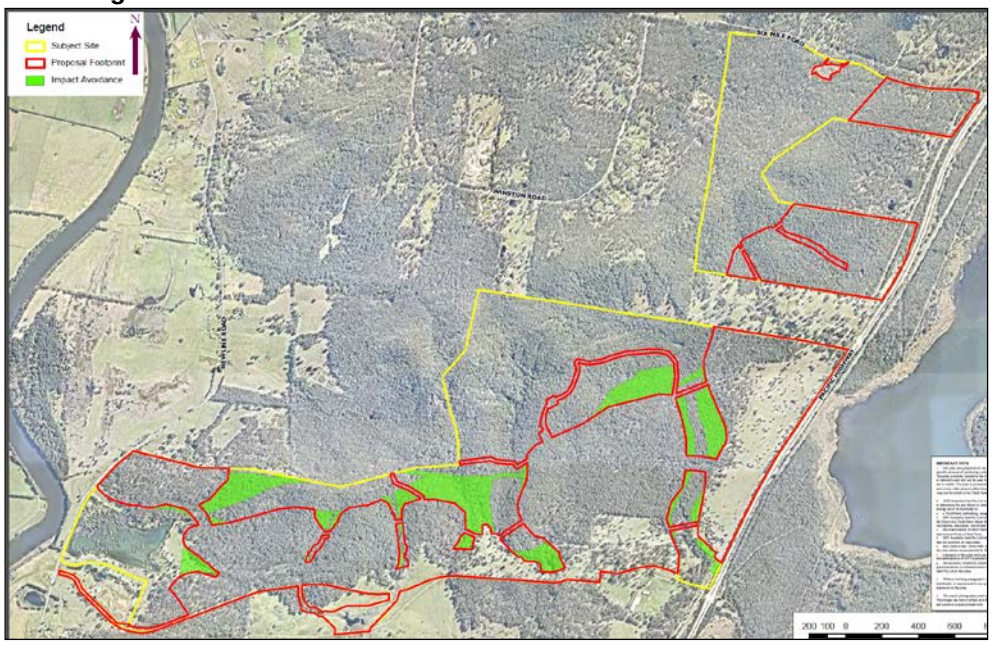
In seeking to define an area suitable for the long term sustainable conservation of local biodiversity values (SIS Principle No.1), the SIS considered key principles relevant to defining an appropriate long term sustainable Conservation Area. They are:

- Patch size and integrity: Larger patches with proportionally reduced edge length enhances the prospect of improved biodiversity outcomes by catering for species with larger home ranges, minimising risk of impact from external threatening processes and reduced influence from edge effects.
- Habitat condition and value: Preferential incorporation of areas with higher biodiversity value (e.g. areas of relatively high hollow-bearing tree and fallen log density and Preferred Koala Feed Trees (PKFTs)) to minimise impacts at the landscape scale, thereby allowing for ongoing local persistence of threatened species.
- Movement pathways: Local and regional movement pathways or corridors have been considered together with zone boundaries and the Proposal, suitable for activities such as revegetation works (e.g. plantings around wetland 803) for the purposes of improving the functioning of retained habitat.

In applying these principles, the SIS determined that much of the existing E2 zoned land comprised areas of high value habitat conducive to, or in need of, improvements to ensure a resilient, and long term sustainable habitat. In addition, however, the SIS identifies that some 38.5ha (about 12.9%) of the urban zoned land within the subject site exhibits values that are worthy of inclusion in a Conservation Area.

Adopting this ***impact avoidance measure*** reduces the developable area of the site from 311.4ha to 272.88ha (areas of urban zoned land to be included in the proposed Conservation Area are shown green in **Figure 80**), increasing the proportion of the site to be dedicated to Conservation purposes from 39.8% to 47.2%.

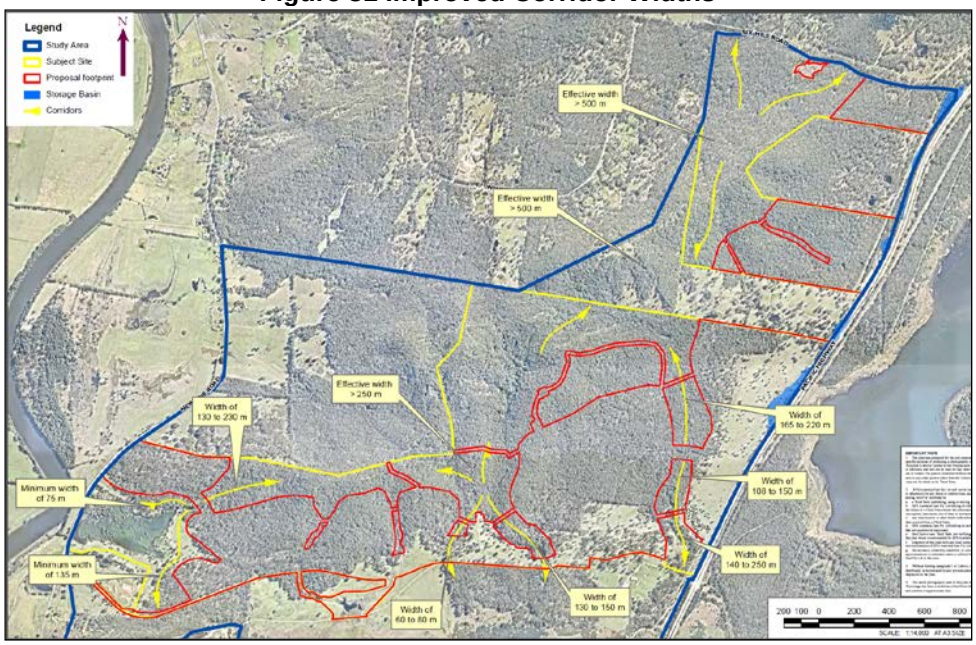
Figure 80 Residential Zoned Land included in Conservation Area



Source: RPS Species Impact Statement

The impact avoidance measure increases the area of land to be retained within a Conservation Area to 244.5 ha, and importantly, enables compliance with the Ecobiolgical (2009) recommendation to increase corridor widths (see **Figure 81**).

Figure 81 Improved Corridor Widths



Source: RPS Species Impact Statement

The areas of impact avoidance and the rationale for avoidance is provided in **Table 18:**

Table 18 Impact Avoidance Areas and Rationale

Impact Avoidance	Rationale	Area Avoided (ha)
1	Substantially increase patch integrity by limiting edge to area ratio (i.e. reduce edge effects)	2.23
2	Avoid area with high foliage nutrient value for the Koala Avoid area with high hollow-bearing tree density Increase vegetated corridor width to wetland area	6.18
3	Avoid area with high foliage nutrient value for the Koala and area actively used by the Koala	1.31
4	Avoid area with high foliage nutrient value for the Koala and area actively used by the Koala including breeding female activity Substantially increase patch integrity by limiting edge to area ratio (i.e. reduce edge effects) Increase vegetated corridor width to vegetation situated south of the study area	11.40
5	Avoid area with high foliage nutrient value for the Koala and area actively used by the Koala	3.16
6	Avoid area with high foliage nutrient value for the Koala and area actively used by the Koala including breeding female activity Substantially increase patch integrity by limiting edge to area ratio (i.e. reduce edge effects) Avoid area with high hollow-bearing tree density Avoid the majority of habitat occupied by *Corybas* × *dowlingii*	5.36
7	Avoid area with high foliage nutrient value for the Koala and area actively used by the Koala including breeding female activity Substantially increase patch integrity by limiting edge to area ratio (i.e. reduce edge effects). Avoid area with high hollow-bearing tree density	6.11
8	Increase vegetated corridor width to vegetation situated south of the study area	2.72
Total		**38.47**

Source: RPS Species Impact Statement

Adopting the impact avoidance measure redefines the boundaries between the urban and conservation areas of the site, which can broadly be described as:

- The 'Conservation Area': This delineates an area for the managed conservation and protection of affected biodiversity values. It comprises 244.25 ha of land, including 38.5ha of urban zoned land which contains high biodiversity values; and
- The 'Impact Area': This delineates areas where impact avoidance is not necessary to avoid a significant impact, and involves land the subject of Stage 1 Subdivision Works (Initial Site Preparation Works) which is 272.88 ha in area comprising 212.14 ha of native vegetation and 60.74 ha of cleared lands.

4.6.5 Recommended Site Preparation

The following is an extract of **Section 3.2**.

The SIS recommends that the site be prepared in a manner that will enhance and protect areas of high quality habitat, enabling the environment and affected species to transition away from or adjust to the impacts associated with disturbing and clearing lower quality habitat areas of the site to enable urban development

The Proposal therefore involves the delivery of restoration, mitigation and conservation works designed to attain localised ecological benefit for affected threatened species and ecological communities within the proposed ***Conservation Area***, while gradually preparing the ***Impact Area*** through a program of sequenced and managed habitat loss over an 8+ year timeframe to enable species transition to the adjacent Conservation Area where desirable.

To enable this approach, the SIS recommends that the Proposal adopt the following interrelated measures:

- **Impact Mitigation** measures, including habitat retention, restoration and protection within the proposed ***Conservation Area*** in accordance with a Biodiversity Management Plan (BMP)

- **Impact Minimisation** through progressive implementation in the proposed ***Impact Area*** over three (3) sequential Phases, a three (3) step vegetation clearing procedure, carried out over an 8+ year time frame allowing time to monitor and minimise impacts on affected threatened biodiversity, regulated in accordance with a Vegetation Management Plan (VMP)

4.6.6 Impact Mitigation

The following is an extract of **Section 3.2.1.**

The SIS recommends the establishment of a Conservation Area via the implementation of a BMP that will address relevant existing key threatening processes acting on this land for the benefit of the species (e.g. improve vegetation structure, plant species diversity, habitat condition, predation pressures and competition with exotic fauna).

Works proposed in the Biodiversity Management Plan include:

- Phase 0: Revegetation in cleared lands to benefit the Koala and winter-spring nectar dependent species (see **Figures 37 to 40**);
- Phase 0: Habitat enrichment works for the Koala (see **Figure 41**);
- Phase 0 and 1: Habitat enhancement (i.e. installation of hollows, emplacement of fallen logs) (see **Figure 42**);

- Phase 0 to 3: Weed management (e.g. removal of Lantana and African Olive)(see **Figure 43**);
- Phase 0 to 3: Feral animal control (e.g. wild dogs, feral cats and deer);
- Phase 1: Fencing of Conservation Areas (see **Figure 45**) to:
    - curb and deter illegal and uncontrolled activities (e.g. illegal dumping, timber getting, hunting)
    - manage existing rural activities that impact on native plants and weed dispersal (e.g. grazing by cattle, horses, goats)

The details of each recommended activity under the BMP are provided in the description of the Stage 1 Proposal (see **Section 3.2.1**)

Restoration and improvement works under the BMP will ensure resilient and long term sustainable habitat within the proposed Conservation Area, and BMP works are to commence prior to impacts managed under the VMP to enable species transition where desirable.

4.6.7 Management of Impacts
The following is an extract of **Section 3.2.1.6**.

Fencing
The SIS recommends that the interface between the Impact Area and the Conservation Area is to be characterised by a Koala proof fence with Koala bridges and grids (see **Figure 45**), which will have the purpose of:

- Excluding free ranging Koala's from the urban area to prevent mortality from domestic dog attack, swimming pool entrapment, and vehicle strike;
- Excluding domestic dogs from the Conservation Area to prevent mortality from domestic dog attack and enable wild dog management; and
- Aiding the efficient movement of Koalas within the Conservation Area along designated habitat corridors.

In-Perpetuity Conservation Agreement
KHD propose to enter a Voluntary Planning Agreement (VPA) with Port Stephens Council to ensure a mechanism is in place to establish, protect, manage and fund the proposed Conservation Area in-perpetuity.

It is intended under the VPA to complete the works specified within the BMP within a five (5) year period (commencing with the issue of the Stage 1 Subdivision Works Certificate (SWC) – to the extent that a SWC is required (see **Section 3.2**)). It is within this time that the proposed Conservation Area will have matured sufficiently to reduce the management required, reverting to a maintenance regime.

Once it is determined that the BMP has been adequately implemented by achieving its objectives, the BMP is proposed to be replaced by a separate 'maintenance' focused management regime in the form of a Biodiversity Conservation and Management Plan (BCAMP). The BCAMP would be funded via the VPA, and will serve to maintain the establishment works achieved through the BMP by focusing on the maintenance of weeds, feral fauna and infrastructure within an in-perpetuity management framework.

4.6.8 Impact Minimisation

The following is an extract of **Section 3.2.2**.

The proposed Impact Area (comprising urban zoned land, less those parts included in the Conservation Area) includes a total of 212.14 ha of native vegetation comprising threatened species habitat and 59.87 ha of cleared lands. Site preparation works within the Impact Area are to be carried out under Stage 1 in accordance with the VMP

The VMP aims is to provide a considered and orderly approach to the removal and/or modification of vegetation and habitat during the site preparation works, particularly the removal of vegetation and habitat (i.e. impact minimisation) in a manner consistent with the Section D14.33 of Port Stephens Council DCP 2014 (i.e. impact minimisation).

More specifically, the VMP provides a program and specifications for works that aim to:

- Restore and protect creek line and riparian areas;
- Manage impacts on threatened species, endangered ecological communities and habitat trees through implementation of a progressive clearing process that allows time for species to adjust and/or relocate from Impact areas to Conservation Areas;
- Outline the management framework for minimising impacts on vegetation and habitat within the Impact Area;
- Identify the appropriate timing of works including site preparation, resource recovery (extraction of timber, native plants and bushrock etc), planting, weed management, and also providing a schedule of works;
- Identify and assign responsibilities for ongoing management actions over an 8+ year period; and
- Ensure that the project is planned, designed and implemented by informed experienced contractors in order to avoid harm to the quality, stability and natural functions of remnant bushland and riparian areas

Site preparation works within the Impact Area involves three (3) steps of sequential vegetation clearing within each Phase to ensure clearing activities are sensitive to the habitat needs of affected species.

- Step 1: Exotic flora removal;
- Step 2: Partial vegetation removal; and
- Step 3: Complete vegetation removal.

To ensure impact minimisation, to prevent premature and indiscriminate clearing, and to facilitate the movement of fauna into adjoining vegetation:

- each of the three (3) Steps must be completed in a Phase prior to carrying out Step 2 and Step 3 in a subsequent Phases;
- each of the three (3) Steps must be completed within a Phase before development can be carried out on land in that Phase;
- Step 3 in any Phase can only occur to the extent that consent is granted for development within that Phase;

The nature of activities within each Step and the proposed timing are noted in **Section 3.2.2.**

4.6.9 Key Fish Habitat

To inform an assessment of the Concept Proposal under Part 7A of the Fisheries Management Act 1994, RPS Group prepared a **Key Fish Habitat Assessment** (**Attachment I**).

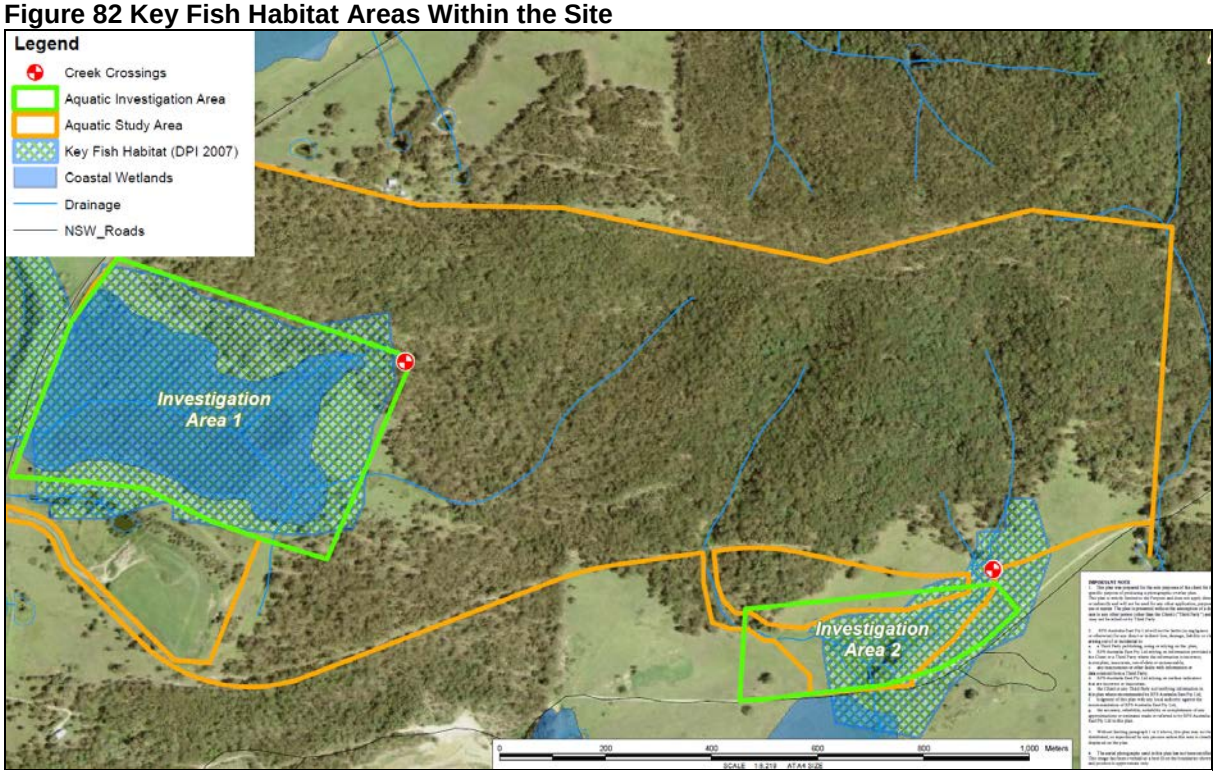
The NSW Department of Primary Industries (NSW DPI) is responsible for conserving the State's fishery resources and protecting and conserving fish habitat and threatened aquatic species in NSW waters (including permanent and intermittent, marine, estuarine and freshwater waterways).

Fish are defined as all aquatic invertebrates such as yabbies, shrimps, oysters, mussels, insect larvae, beach worms, sea stars, jellyfish etc. However, there is a proviso that habitats that might otherwise be excluded but are known or likely to be habitat for listed threatened species, populations or communities are always included.

Water Land is defined as land that is intermittently or permanently submerged by water (either naturally or artificially) and includes wetlands.

The extent of mapped Key Fish Habitat on the site and the location of creek crossings potentially impacting on Fish are depicted in **Figure 82**

Figure 82 Key Fish Habitat Areas Within the Site



Source: RPS Group Key Fish Habitat Assessment

The outcomes of assessment by the RPS Group within each investigation area in **Figure 82** are summarised as follows:

Investigation Area 1:
Wetland 803 is characterised as a mapped Coastal wetland associated with the Williams River. The wetted area of the wetland has approximate dimensions of 600 m east to west and 330 m north to south. The wetting and drying Phases of this wetland along with the historical land management practices has resulted in functional seasonal mud flats between the maximum wetted extent and the permanent ponding areas.

The wetland is generally characterised by mosaicking deep polling permanent water and vegetation communities including Swamp Oak Woodland, Paperbark Swamp Woodland and Swamp Meadow Complex (Alluvium 2019). This wetland and the vegetation communities are commensurate with the general characteristics of a Coastal Wetland under the "SEPP Coastal Management" and are also identified spatially under associated SEPP mapping (DEP, 2018). The Coastal wetland is commensurate with the DPI (2019) definition for key fish habitat as a "wetland associated with other permanent fish habitats (e.g. permanent rivers)". Furthermore, investigation area one is positively identified under the Key Fish Habitat mapping for Port Stephens LGA (DPI) 2007.

Area 1 potentially provides habitat for the threatened species Southern Purple Spotted Gudgeon (*Mugenda asperse*). This freshwater benthic species occupies a variety of habitat types such as rivers, creeks and billabongs with slow-moving or still waters or in streams with low turbidity. This species is also a structure dependant preferring areas with good cover such as aquatic vegetation, overhanging vegetation from riverbanks, leaf litter, rocks or snags are important for the species. The key threats to this species locally are predation by introduced fish such as Eastern Gambusia (*Gambusia holbrooki*); and loss of favourable habitat; particularly aquatic plants; thermal pollution; increased turbidity and damage of stream banks by livestock access; and decreased water quality due to agricultural runoff and siltation.

Investigation Area 2:
Investigation Area Two is located on the southern boundary of the Proposal and is bordered to the south by the Irrawang wetland. This area is located on a south facing slope within the drainage line at the confluences of two first order streams. The area has been historically impounded by rock wall and road as an agricultural dam. The dam has been heavily modified and is currently open on all side for stock access. Aerial imagery indicates that the dam is associated with the southern wetland by its position in the landscape and potentially has a shared ground water regime as indicated by a historically present shared wetted boundary despite the influence for the dam.

The vegetation surrounding the dam is characterised by mixed native and exotic pastures with the dam itself currently dominated by a heavy infestation of water hyacinth (*Eichhornia crassipes*) which is listed as a weed of national significance (WoNS. Other species identified within the dam include isolated individuals of Cape Waterlily (*Nymphaea capensis*) and *Juncus* spp. This area is part of the Key Fish Habitat mapping (Port Stephens LGA Key Fish Habitat (DPI) 2007) despite the current condition of this water body and its low value for aquatic species.

The assessment by RPS Group indicates that development in accordance with the Concept Proposal will impact upon Key Fish Habitat for works associated with:

- proposed creek crossings 'A' and 'D' ; and
- the dam and impoundment located within in Investigation Area 2.

Development works and activities within or adjacent to waterways mapped or defined as Key Fish Habitat require permits, and are subject to integrated development assessment provisions. The NSW DPI issues permits for several types of activities that may harm fish habitats.

The assessment by RPS Group summarises avoidance measures that could be adopted by the Concept Proposal within each Investigation Area (as depicted in **Figure 82**) to avoid licencing requirements and/or the integrated development provisions (see **Table 19**).

Table 19 License and/or Integrated Development Avoidance

Proposal Impact	Potential Licencing Trigger	Avoidance Measure
Investigation Area One		
Construction of roadway through areas mapped as Key fish Habitat or Coastal Wetlands (Proposed Creek Crossing A, (Northrop 2019))	Section 201	Do not carry out any excavation works within or adjacent to "water land" (Appendix A) including groundwater dependant vegetation communities
	Section 219	Do not temporarily inhibit or alter the flow of water in this locality
Investigation Area Two		
Clearing of Dam and drainage lines vegetation for the purpose of increasing the capacity of the retention basin	Section 201	Do not carry out any excavation works within or adjacent to "water land" (Appendix A)
Repair and improvement of Impoundment structure (Proposed Creek Crossing D, (Northrop 2019))	Section 201	Do not carry out any excavation works within or adjacent to "water land" (Appendix A)

Source: RPS Key Fish Habitat Assessment

It is advised that any actions outlined above or any additional actions undertaken within "water land" located within or adjacent to Key Fish Habitat will trigger a requirement to seek concurrence and licencing under the FM Act (see **Table 20**).

Table 20 Fish Habitat Recommendations

Potential Impact	Recommendations
Investigation Area One	
Construction of roadway through areas mapped as Key fish Habitat or Coastal Wetlands (Proposed Creek Crossing A, (Northrop 2019))	It is recommended that the proponent seek concurrence from the DPI regarding these actions. A licence under "*Section 201 - permit to carry out works of dredging or reclamation*" and "*Section 219 - permit to obstruct the free passage of fish*" of the FM Act may be required.
Investigation Area Two	
Clearing of Dam and drainage lines vegetation for the purpose of increasing the capacity of the retention basin	It is recommended that the proponent seek concurrence from the DPI regarding these actions. A licence under "*Section 201 - permit to carry out works of dredging or reclamation*" of the FM Act may be required.
Repair and improvement of Impoundment structure (Proposed Creek Crossing D, (Northrop 2019))	It is recommended that the proponent seek concurrence from the DPI regarding these actions. A licence under "*Section 201 - permit to carry out works of dredging or reclamation*" of the FM Act may be required.

Source: RPS Key Fish Habitat Assessment

4.7 Bushfire Hazard

Australian Bushfire Consulting Services (ABCS) assessed the site and the Proposal (see **Attachment P**).

The subject site is subject to the Port Stephens Council Development Control Plan Part D14 Kings Hill – Raymond Terrace.

The subject sites are mapped as bushfire prone land and therefore the application of Planning for Bush Fire Protection is relevant to the development proposal.

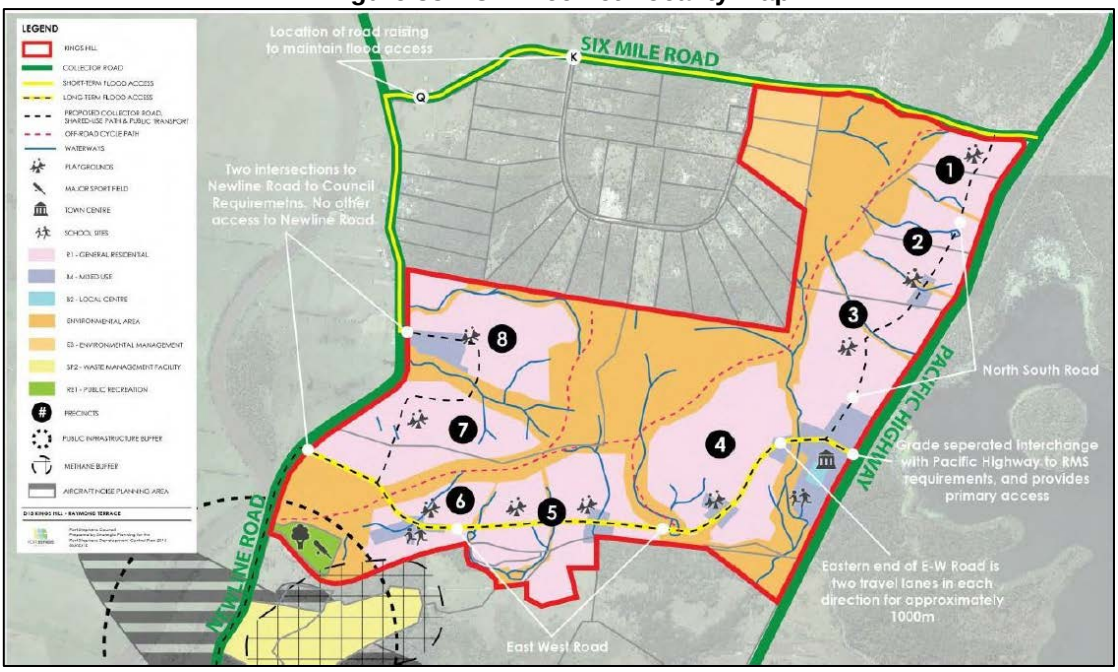
4.7.1 Assessment Methodology

An assessment was carried out against the pre-release PBP 2018 (which has since been adopted as PBP 2019 in the Environmental Planning & Assessment Regulations on 1 March 2020). The NSW RFS advised that:

> *PBP 2006 will continue to remain in force until PBP 2018 is adopted through referencing in relevant legislation and instruments. However, to assist in the interim period, proposals that comply with the requirements of the pre-release edition of PBP 2018 may still be considered……*
>
> *During the interim period up to the adoption of PBP 2018, the NSW RFS will assess applications for a BFSA under either PBP 2006 or the pre-release edition of PBP 2018. An assessment to which the proposal conforms with or deviates from either PBP 2006 or the pre-release edition of PBP 2018 will be required to accompany development applications which fall under section 100B of the RF Act*

The bushfire report observes that the Concept Proposal is generally in accordance with the PSC DCP 2013 Locality Controls Map, and the assessment refers to the Precinct numbers within that map (see **Figure 83**).

Figure 83 DCP Precinct Locality Map



Source: PSC DCP contained in Australian Bushfire Consulting Service

The following observations are made in determining Asset Protection Zones applicable to the site:

Vegetation Types

Post subdivision the bushfire hazardous vegetation *within the sites* will consist of generally only two vegetation communities. This includes forest within the E2 zoned areas and wetland within the western part of the site. Forest has also been assumed within the E2 zoned area west of Precinct 6 (and east of the wetland / lagoon area).

Where the forest is retained as narrow corridors along creek lines forming a "riparian zone" less than 20 metres wide either side and / or where the vegetation provides a less than 50 metre fire run directly towards the development areas, the hazard has been downgraded to "remnant" vegetation.

Where remnant vegetation is identified, the asset protection zones applied are the same as for rainforests. Grassland areas have been identified adjacent the subject site to the south of Precincts 4 and 5 and to the north and west of Precinct 7. Woodland and forest areas have been identified within No. 3385 Pacific Highway, Kings Hill that lies between Precinct 2 and 3 and also north of Precinct 1 within No. 26 Six Mile Road Eagleton.

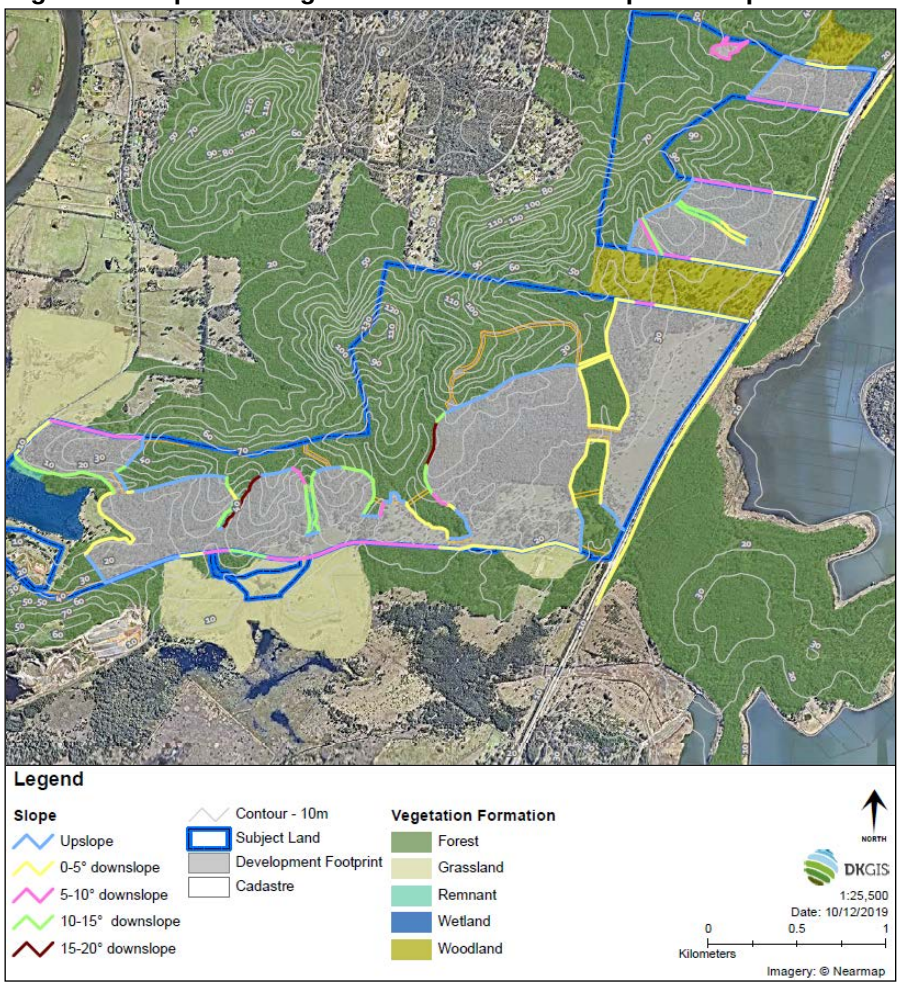
Topography

The slope was assessed over a distance of at least 100 m from the proposed building footprint towards the various vegetation communities constituting the hazard. In assessing the slope, the gradient within the hazard (vegetation) which will most significantly influence the fire behaviour was considered.

The slope was determined by 1 metre contour topographic mapping and then verified in numerous locations onsite using an inclinometer. Where remnant vegetation has been identified PBP 2018 requires that the effective slope is to be determined under the remnant that provides the most significant bush fire behaviour. Discussions with the NSW RFS infer this to be the slope within the vegetation in a direct line towards the subject site and as such, the slopes perpendicular to the development areas into the remnant vegetation have been applied.

The slope and vegetation is mapped in the report to inform the risk assessment and the Asset Protections Zones (APZs) to be accommodated within the Concept Proposal (see **Figure 84**).

Figure 84 Slope and Vegetation relative to Concept Development Area



Source: Australian Bushfire Consulting Service

Typical Asset Protection Zones

The recommended APZs for residential, commercial and Special Fire Protection Purposes (SFPP) (i.e. the school) have been devised in accordance with Appendix 1 of PBP 2018 (see **Table 21 and Table 22**). Slight variations (reductions) in APZ may be applied with design fire modelling in future Development Applications.

Table 21 Residential and Commercial APZs

	EFFECTIVE SLOPE				
	Up slopes and flat	>0°-5°	>5°-10°	>10°-15°	>15°-20°
KEITH VEGETATION FORMATION	**Distance (m) from the asset to the predominant vegetation formation**				
Rainforest (or remnant forest vegetation)	11	14	18	23	30
Forest (Shrubby and Grassy)	24	29	37	45	57
Woodland	12	16	20	25	32
Grassland	10	12	13	15	17

Source: Australian Bushfire Consulting Service

Table 22 SFPP School APZs

	EFFECTIVE SLOPE				
	Up slopes and flat	>0°-5°	>5°-10°	>10°-15°	>15°-20°
KEITH VEGETATION FORMATION	**Distance (m) from the asset to the predominant vegetation formation**				
Rainforest (or remnant forest vegetation)	38	47	57	69	81
Forest (Shrubby and Grassy)	67	79	93	100	100

Source: Australian Bushfire Consulting Service

***Note:** The APZ in Table 21 and Table 22 are based on a draft document (pre-release BP 2018). Minor variations may apply to future Development Applications for subdivision under the final published PBP 2019.*

4.7.2 Recommended Asset Protection Zones

4.7.2.1 School Site APZs

The report recommends that the school site accommodate a 79m APZ between the school buildings and the Conservation Area to the east. Other observations, recommendations and site specific criteria are noted in **Table 23**.

Table 23 School Site Preliminary Assessment

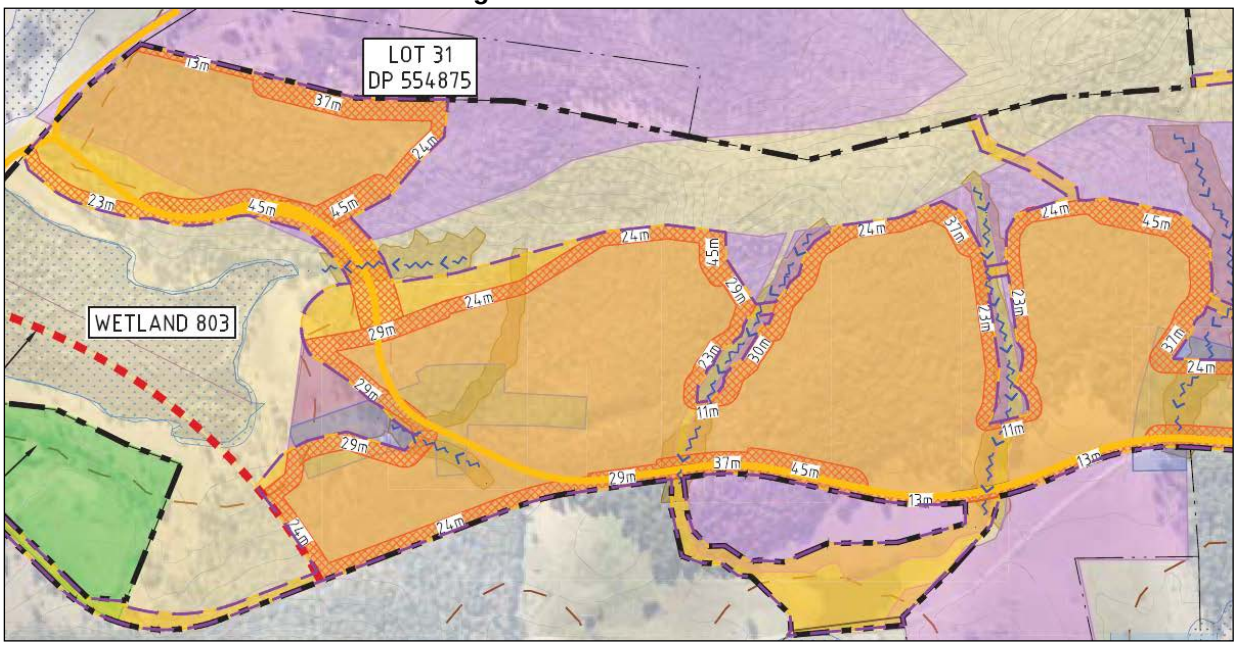
Aspect	North	East	West	South
Vegetation Structure	n/a Precinct 4 residential release area	Forest	n/a Precinct 4 residential release area	n/a Precinct 4 residential release area
Slope	n/a	0-5° downslope slope	n/a	n/a
Asset Protection Zone	n/a	79 metres	n/a	n/a
Features that may mitigate the impact bush fire on the proposed development.	The adjacent park to the northeast is a proposed sports oval and outdoor recreational area and all land within that park is to be managed as an asset protection zone. Between the oval and the school site is a first order stream and all land along the creek between the school and the oval is also to be maintained as an asset protection zone. The forest to the east is within a main north / south environmental corridor. Post development of the commercial centre this corridor will have a restricted fire development area of approx. 110 metres. Within the vegetation corridor there is also small wetlands / dams and forested wetland patches however forest has been applied uniformly from the hazard interface.			
Noteworthy landform & environmental features.	Proposed east / west road corridor / residential development	Asset Protection Zone	Proposed east / west road corridor / residential development	Proposed road / residential development

Source: Australian Bushfire Consulting Service

4.7.2.2 Development Area APZs

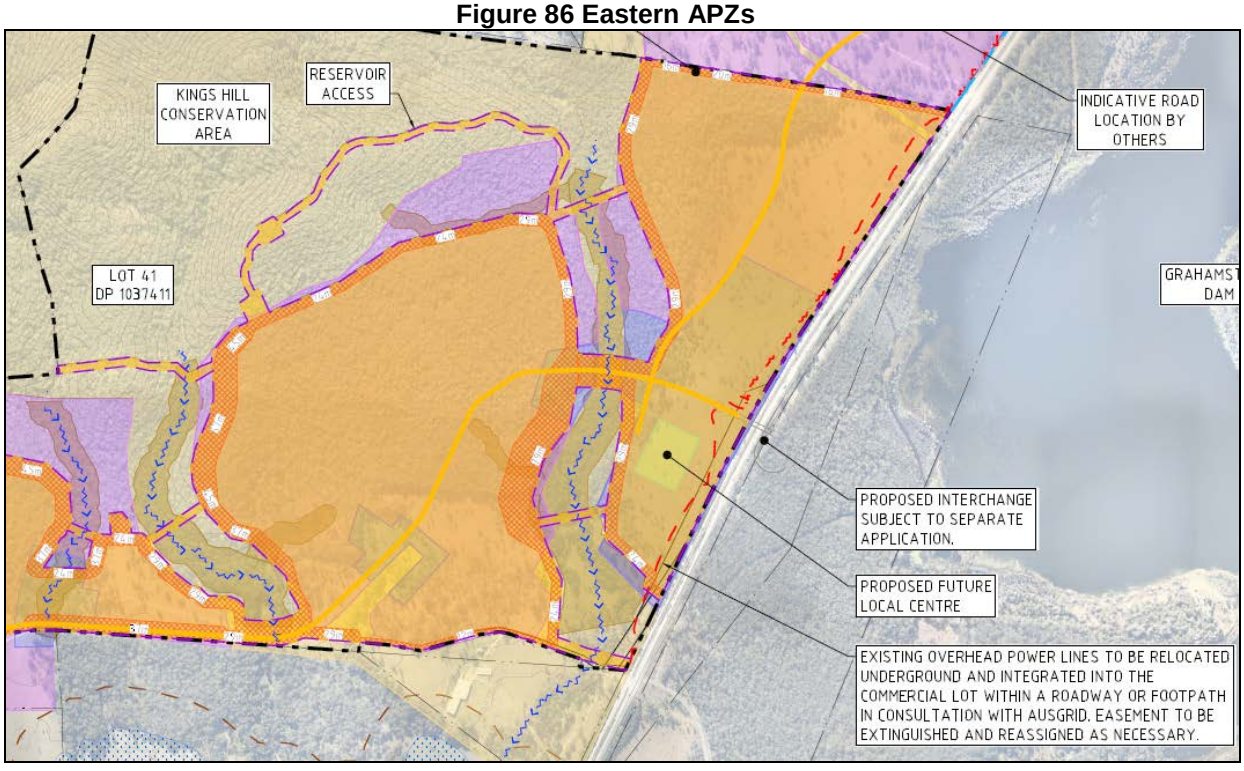
The application of APZs to developable land within the Concept Proposal is depicted in **Figures 85, 86 and 87.** To avoid any doubt, the extent and location of the recommended APZs are outside of the land zoned or intended for Conservation Areas.

Figure 85 Western APZs



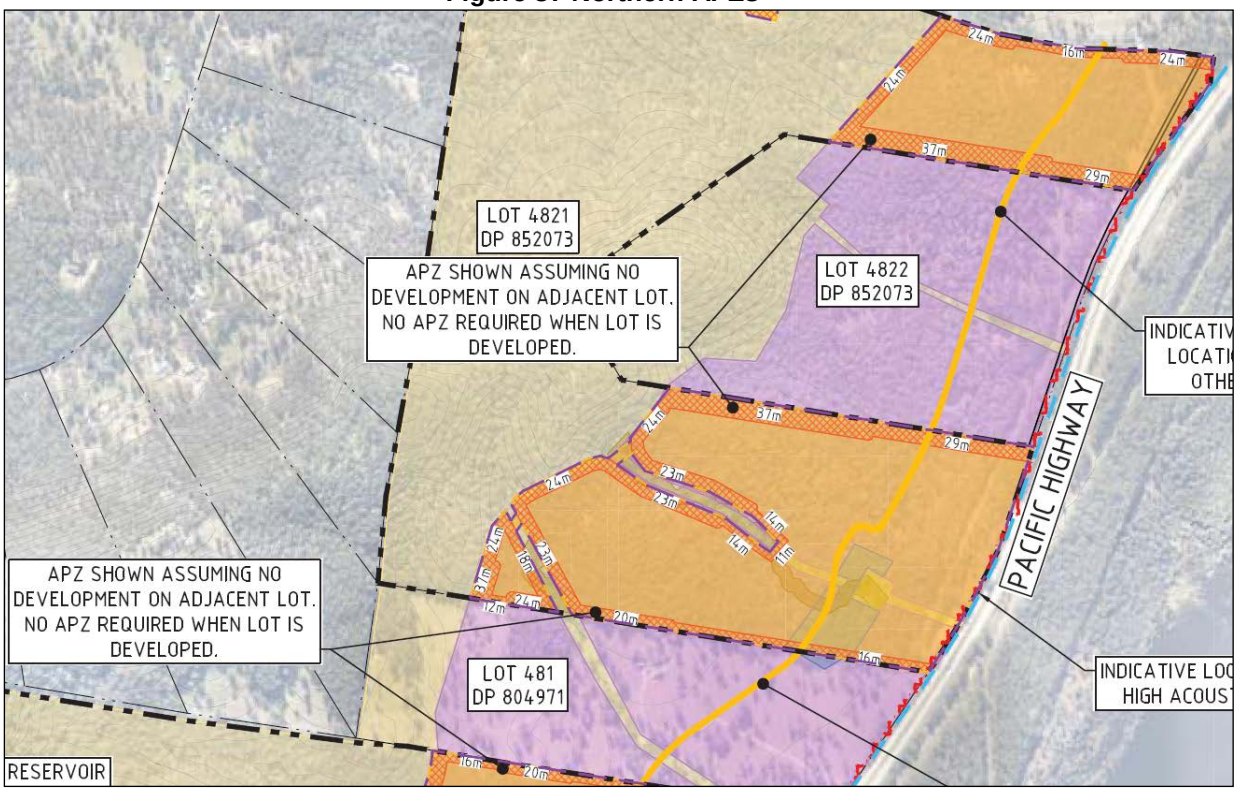
Source: Australian Bushfire Consulting Service

Figure 86 Eastern APZs



Source: Australian Bushfire Consulting Service

Figure 87 Northern APZs



Source: Australian Bushfire Consulting Service

In addition to the APZs, the ABCS report contains requirements and specifications to be adopted in future DAs for urban development. The recommendations are in relation to the following:

- Access and Egress
- Services
- Construction
- Staging
- Fencing and Bushfire Access to Conservation Area

4.7.2.3 Conservation Area (BMP) and Development Area (VMP) Requirements

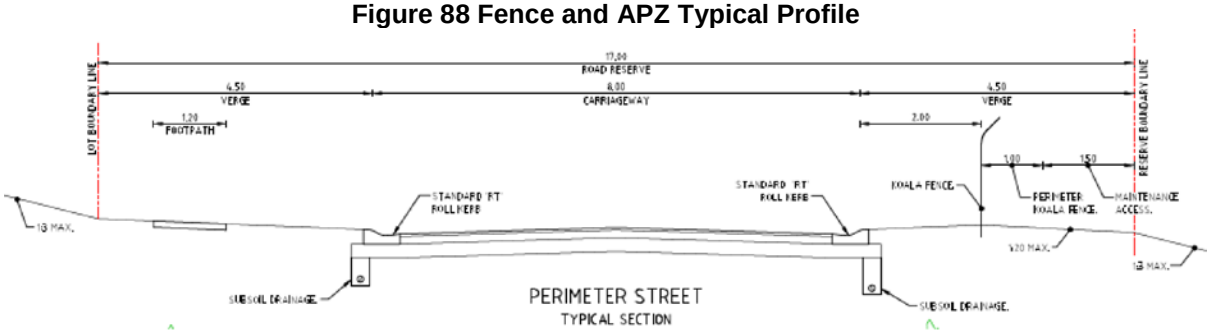
Conservation Area

The revegetation and environmental management in the Conservation Area (outside the development area) is noted to be inconsequential to the recommendations of the bushfire report. Management of the Conservation Area is assumed to be in accordance with a separate Biodiversity Management Plan (BMP) where ecological fire management practices may occur.

The koala proof fence is proposed to be incorporated within nearly all asset protection zones. No hazard reduction (burning) is required for asset protection zone purposes however it may be needed from time to time for ecological reasons. Additionally, back-burning may be undertaken as an active firefighting measure. To this end access through the fence at regular intervals will be necessary for fire fighter access to the hazard interface.

It is understood that the fence will be installed within the development footprint area and it has been proposed that it will be offset from the outer limit of the footprint extent so that a managed area can be maintained either side of the fence. This is important in that it also provides dual functionality allowing pedestrian access along the hazard interface where fire fighters can work adjacent to, and parallel to, any retained vegetation for firefighting, back burning or ecological burning purposes (see **Figure 88**).

Figure 88 Fence and APZ Typical Profile



Source: Australian Bushfire Consulting Service

The distance between access points should be sufficiently spaced to provide access for reasonable hose lengths. Pedestrian access gates should be installed along the koala proof fence so that these distances are achieved, with gates located within 20 metres of a hydrant and the distance between gates less than 140 metres, with locks that meet NSW Rural Fire Services requirements.

Development Areas

The ABCS report assumes that all areas within the development footprint will be managed in accordance with a Council approved Vegetation Management Plan (VMP) for the life of subdivision construction works, which has provisions within to provide landscape scale fuel management to meet APZ standards specified in PFBP 2018 (i.e. vegetation clearing procedure).

The proposed detention basins, bio filtration and retention basins are required to be vegetated consistent with the requirements for an asset protection zone with trees spaced 2 – 5 metres and understory (grasses) managed to below 100 mm. These areas will therefore not compromise the bushfire protection recommendations of the report.

Bushfire Safety Authority

With the adoption of the bushfire recommendations, the Concept Proposal is eligible for a Bushfire Safety Authority (BSA) issued by NSW Rural Fire Service.

4.8 Stormwater Management

Northrop Engineers assessed the site to determine the stormwater management required to be accommodated within the Concept Proposal (see **Attachment E**). Northrop Engineers also worked in conjunction with **Alluvium** (see *Annexure E* to Northrop Report) to ensure the recommended stormwater management includes appropriate wetland protection measures.

4.8.1 Existing Water courses

As described in the Site Analysis in **Section 2.3.5**, numerous ephemeral watercourses are located within the subject site with many observed to be eroded and in a state of degradation. With reference to the PSC DCP Precinct Locality Plan (see **Figure 83**), the watercourses are generally described by Northrop as follows:

- Precincts 3 (south of the East West Link road), and Precincts 4, 5, 6, 7 drain to the south into the Irrawang Swamp;
- Precincts 1, 2 & 3 (north of the East West Link Road) drain underneath the Pacific Highway via existing drainage culverts to Grahamstown Dam*.

  ** Grahamstown Dam is the Hunter Valley's largest drinking water supply. Hunter Water Corporation (HWC) owns and operates the dam, and requires that drainage with the catchment of the Dam be designed to be diverted away from the Dam. A stormwater diversion channel east of the Pacific Highway (predominately on HWC land) has been the subject of extensive design since 2014* (see **Figure 58**). *With the execution of the State VPA between KHD, DPIE and the RMS (now TfNSW) in October 2019, TfNSW is in the process of designing the channel for delivery as part of the Pacific Highway interchange* (see **Figure 59***). Northrop confirm that culverts below the Pacific Highway are in good condition, and to avoid upgrading this infrastructure, detention has been proposed within the site to limit peak post-developed discharge to peak pre-developed discharge.*

Northrop has classified the watercourses in accordance with the Strahler system and in consultation with the NSW Office of Water. Riparian corridors have been adopted in accordance with the Department's *Guidelines for Riparian Corridors on Waterfront Land*, with the required Vegetated Riparian Zone (VRZ) offsets for either side of the classified watercourses shown in **Table 24**.

Table 24 Stream Classifications & Riparian requirements

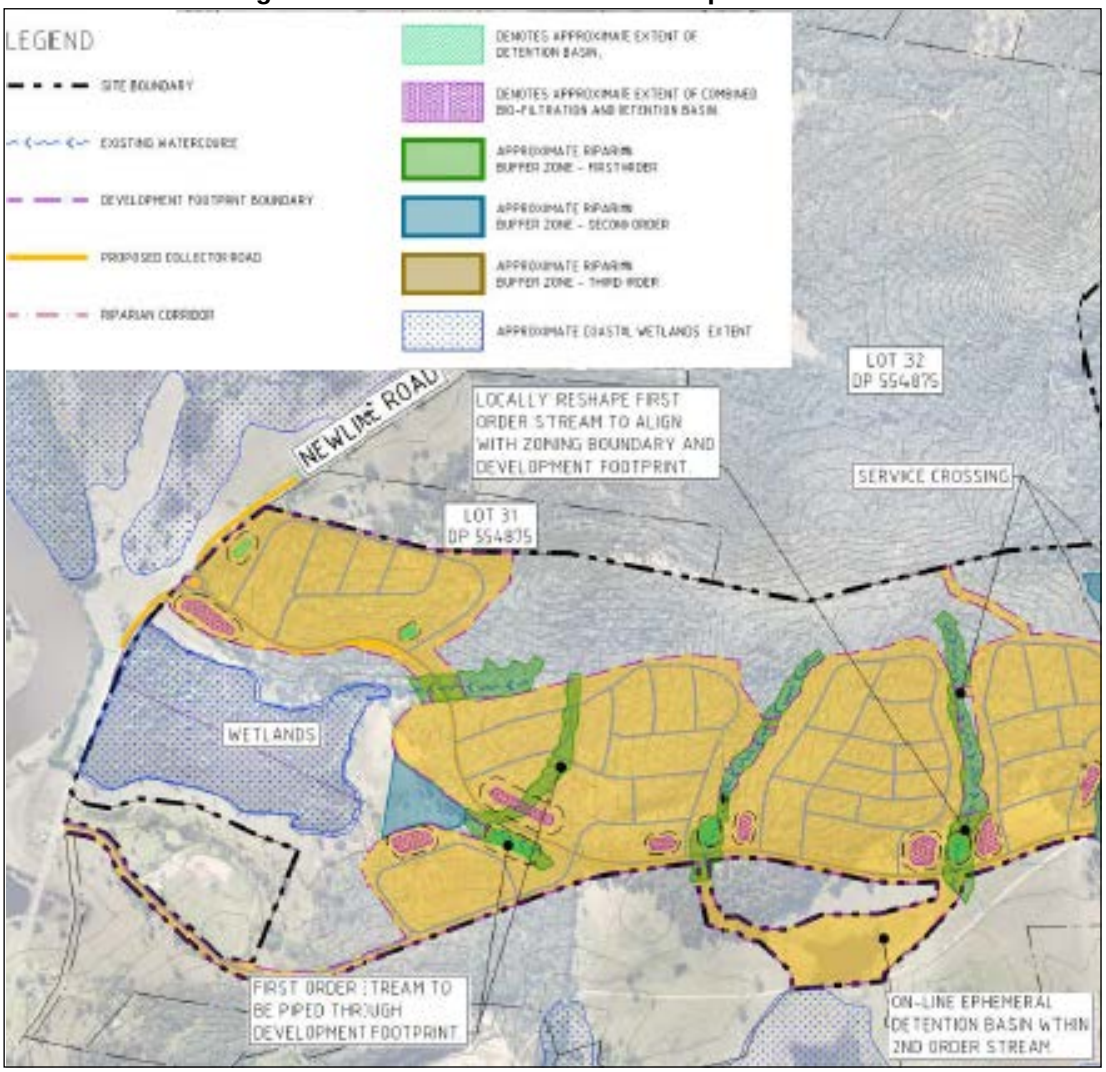
Stream order	Vegetated Riparian Zone Width (m)	Total Riparian Corridor Width (m)
First	10	20m + Channel width
Second	20	40m + Channel Width
Third	30	60m + Channel Width

Source: Northrop Engineers

Northrop assessed the site and informed the Concept Proposal as to how stormwater may be practically integrated and managed to comply with the *Kings Hill Urban Release Area Water Management Strategy Guidelines* prepared by BMT WBM for PSC and the requirements outlined in the PSC DCP, specifically Section D14.D relating to stormwater. The assessment also considers the management of the stormwater impacts on the Irrawang Swamp to address concerns raised by Hunter Water Corporation in their referral response dated 9th January 2019.

The location of the watercourses, the associated riparian zones determined in accordance with the guidelines, and the basis of the design response within the Concept Proposal, is depicted in **Figure 89** and **90**).

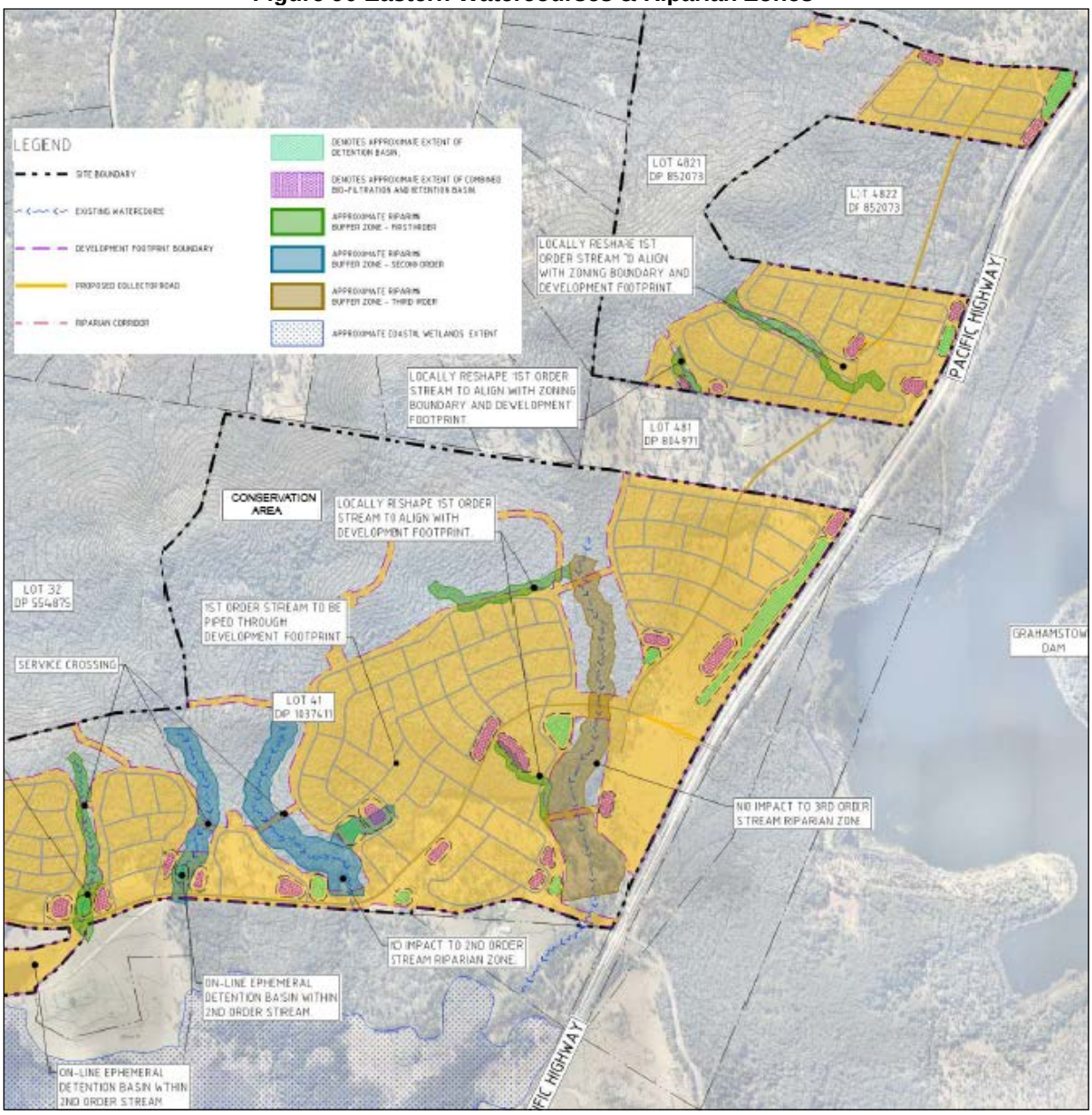
Figure 89 Western Watercourses & Riparian Zones



Source: Northrop Engineers

The assessment ultimately determines the most ideal position for stormwater devices such as detention basins and water quality treatment devices, while maintaining visual amenity and compliance with the requirements stipulated in the DCP.

Figure 90 Eastern Watercourses & Riparian Zones



Source: Northrop Engineers

4.8.2 Management of Water Quantity

Flooding - Some existing waterways within the site are mapped as flood prone land and covered by the flood planning level. In accordance with the NSW Government 2005 Floodplain Development Manual and PSC DCP, all habitable floor levels will be constructed above the Flood Planning Level (FPL). All areas of fill are outside of the mapped flood storage area, so are not expected to impact regional flood levels.

An XP-RAFTS model has been used to estimate the flows at the location where major creeks cross the main Collector road in the vicinity of the subject site. Creek crossings along the main Collector road are proposed to be designed to cater for the 1% AEP plus a freeboard of 500mm to ensure safe evacuation routes are available for residents in the event of a major storm.

Catchments – In a developed scenario, runoff from 45 modelled catchments generally drain to the same outlet locations as the existing catchments. Some re-grading is assumed, resulting in different pre-post catchment sizes draining to each outlet location.

Conveyance - A minor stormwater system will be designed to cater for the requirements of the DCP at the time of detailed design. The major system will cater for the 1% AEP (equivalent to the 1 in 100yr ARI). Flow from upstream of the proposed development will be diverted to a trunk drainage system or natural watercourse to minimise the impact within the future proposed development.

Detention Basins - The *BMT WBM Guidelines* suggest retaining 15mm runoff from the directly connected impervious roof, road, driveway and other paved landscaping areas to minimise the increase in runoff volume. As such, it is proposed that 5kL rain tanks be provided within each dwelling. Additionally, a series of retention basins have been proposed to accommodate the required storage volume throughout the development.

Basins are proposed at 12 different locations across the site. Five (5) of the 12 proposed detention basins will be offline (not within a classified watercourse), while Seven (7) will be online (within a classified watercourse) located along 1st and 2nd order streams within the site boundary in accordance with the NSW Guidelines for Riparian Corridors on Waterfront Land, 2012.

Northrop modelling confirms that pre to post detention requirements can be achieved within the 12 recommended detention basins. Details of the modelled basins, including their size, depth and capacity are provided in **Table 25**, with the relevant catchment areas and basin locations shown in **Figures 68**, **69** and **70**.

Table 25 Modelled Detention Basins

Basin	Basin Area (Ha)	0.5EY depth (m)	Volume (m3)
1	0.1657	1.682	2787
2	0.0731	0.964	704
3	0.0693	0.997	690
4	0.5120	0.997	5104
5	0.2000	0.982	1964
6	0.4852	1.005	4876
7	0.2000	1.079	2158
8a	0.2000	0.517	1034
8b	0.3000	1.252	3756
9	0.1960	1.226	2402
10	1.0150	1.439	14605
11	0.2106	1.438	3028
12	0.1682	1.605	2699

Source: Northrop Engineers

Point of Discharge

Discharge from the site, once treated, will be per existing drainage channels or culverts to existing receiving water bodies (see **Figures 68, 69 and 70**).

4.8.3 Management of Water Quality

Stormwater quality is proposed to be managed through a treatment train approach, adopting stormwater treatment targets stated in the *BMT WBM Guidelines* for the Kings Hill development as well as the Landcom stretch water quality targets (adopted for any part of the development draining directly or indirectly into the Irrawang Swamp).

Northrop developed four (4) MUSIC models to simulate the main discharge locations for the Concept Proposal as follows:

- Model 1: Kings Hill West A – includes sub-catchments C02-C05 which drain to a small wetland referred to as Coastal Wetland 804;
- Model 2: Kings Hill South – includes sub-catchments C06-C15 (excluding C14) which drain to the northern end of Irrawang Swamp;
- Model 3: Kings Hill East – includes sub-catchments C14-C20 (excluding C15) that will enter the Irrawang Swamp from the east via the proposed diversion channel; and
- Model 4: Kings Hill West B – includes sub-catchments C01 which drains towards Newline Road and doesn't enter any wetlands.

A total of 22 sub-catchments are modelled for water quality modelling purposes.

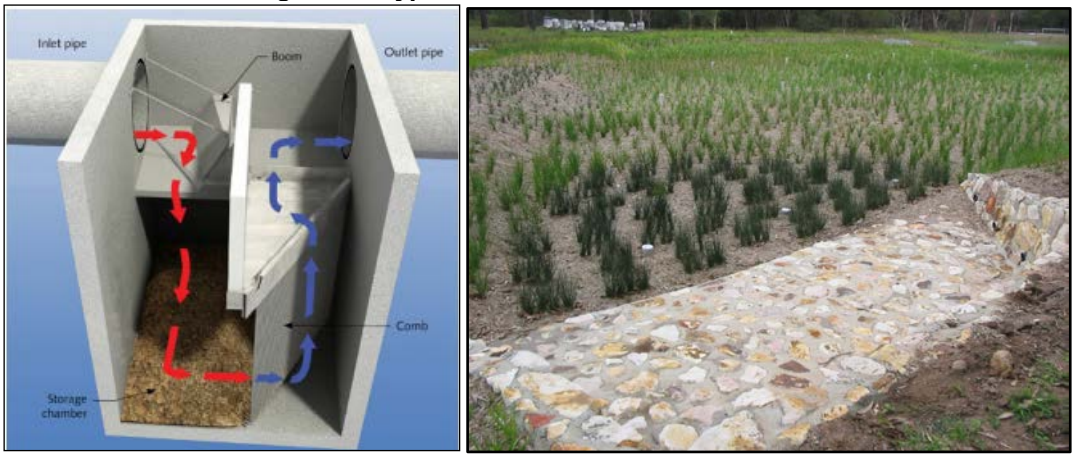
Recommended Water Quality Treatment Devices
The *BMT WBM Guidelines* advocate a number of stormwater treatment devices including swales, constructed wetlands, infiltration basins, media filters and permeable paving, depending on the treatment scale.

These devices were investigated by Northrop as part of the design process, however many were not integrated for a number of reasons;

- In general, slopes within the development footprint are generally too steep to accommodate road side swales. Further consideration is expected for the feasibility of swales during the more detailed design processes;
- Soil properties do not lend themselves to infiltration, especially concentrated at locations immediately downstream of roadways and other infrastructure; and
- It is the preference of the NSW Office of Water to have water quality treatment devices offline which reduces the potential for constructed wetlands to be incorporated as part of the development.

Combined bio-filtration and retention basins in combination with Gross Pollutant Traps (GPTs) are considered the most efficient and economical treatment devices for the Kings Hill development at a precinct scale (see **Figure 91**).

Figure 91 Typical GPT & Bio-Retention Basin



Source: Humes Humegard Technical Manual and and Northrop Engineers

The filter media installed in the basins are highly susceptible to scour and erosion, so it is proposed that flows from the minor events are to enter the basins and flows from the major event will bypass. This will be achieved by a "splitter pit" immediately upstream of the bio retention basin. Flows up to and including the 1 in 2-year event, deemed "low flows" should be diverted to the bio-retention basin, while larger flows should be directed to the downstream detention basin, channel or existing creek. Suitable scour protection will be implemented at all outlets, designed to prevent scour.

Northrop modelled a generic Humegard GPT node upstream of the bio-filtration and retention basins for each catchment. Bio-filtration has been considered downstream of the GPTs for a number of reasons:

- They can be placed offline therefore satisfying the requirements outlined by DI – Water;
- They have minimal standing water within the basin, typically emptied shortly following precipitation events, therefore reducing environments that are susceptible to pest species such as mosquitoes and algae;
- They are typically used as an end of line treatment device and are therefore ideal for the proposed development due to steep grades in upstream reaches of the development;
- They have a greater treatment efficiency per square metre when compared to wetlands and are therefore highly effective at removing suspended solids, nutrients and gross pollutants from stormwater;
- They have the ability to satisfy both water quality and quantity requirements of a development due to retention capacity within the basins; and
- They can be aesthetically pleasing if properly designed with the potential to be easily integrated into parks and surrounding residential zones.

Bio-filtration and retention basins are typically designed as an offline treatment option for runoff prior to discharging downstream. They are commonly designed to allow water to enter, pond and infiltrate through a filter system and exit through an underdrain and pit and pipe network.

Device Sizes and Land Take

Preliminary modelling by Northrop has determined the location and size of each bio-filtration and retention basin required to achieve the treatment targets, and the land take associated within each device in each water quality catchment (see **Table 26**).

Table 26 Bio-filtration Basin Sizes

Catchment	Filter area (m^2)	Surface Area (m^2)	Estimated High Flow Bypass (m^3/s)	Estimated Land Slope at Device (%)	Approximate Land Take (m^2)
C01	1658	1825	0.820	12.0	4144.0
C02	1425	1580	0.275	12.0	4624.0
C03	3900	4154	1.438	11.0	10292.0
C04	1130	1268	0.451	8.0	3039.0
C05	1338	1488	0.132	7.0	3260.0
C06	1840	2016	0.670	18.0	5393.0
C07	4012	4269	1.483	10.0	9993.0
C08	2192	2383	0.911	9.0	5576.0
C09	4658	4935	1.597	10.0	11400.0
C10	1960	2141	0.629	6.0	4201.0
C11	2344	2542	0.540	4.0	4276.0
C12	7825	8183	2.710	4.0	12540.0
C13	1683	1851	0.626	10.0	4704.0
C14	6340	6662	2.171	4.0	10331.0
C15	2106	2294	1.049	2.0	3379.0
C16	435	522	0.167	16.0	1453.0
C17	665	772	0.167	19.0	2570.0
C18	2621	2830	0.769	2.0	4086.0
C19	2219	2411	0.805	5.0	4375.0
C20	1177	1318	0.324	4.0	2413.0
C21	1033	1166	0.339	5.0	2333.0
C22	1858	2034	0.588	4.0	3517.0

Source: Northrop Engineers

The location of each catchment and recommended stormwater basin type (combined bio-retention and retention and/or detention basins) is depicted in **Figures 68 to 70**.

Water Quality Modelling Outcomes

Each bio-filtration basin has been modelled and preliminarily designed to meet the required reduction targets, with the exception of Phosphorous. The targets are shown in **Table 27**.

Table 27 Water Quality Treatment Targets

Pollutant Type	BMT WBM Guidelines Removal Target	Landcom Stretch Water Quality Targets
Total Nitrogen	50%	65%
Total Phosphorous	65%	85%
Total Suspended Solids	85%	90%

Source: Northrop Engineers

The combined treatment train effectiveness for the four separate MUSIC models is shown in **Table 28**.

Table 28 Water Quality Treatment Effectiveness

Pollutant	Source	Residual	Reduction (%)
MODEL 1 RESULTS (Kings Hill West A)			
TSS (kg/yr)	25800	2570	91
TP (kg/yr)	54	10.7	80.2
TN (kg/yr)	463	143	69.1
MODEL 2 RESULTS (Kings Hill South)			
TSS (kg/yr)	122000	9280	92.4
TP (kg/yr)	228	41.7	81.7
TN (kg/yr)	1970	572	71
MODEL 3 RESULTS (Kings Hill East)			
TSS (kg/yr)	70700	5380	92.4
TP (kg/yr)	134	24.7	81.6
TN (kg/yr)	1160	335	71
MODEL 4 RESULTS (Kings Hill West B)			
TSS (kg/yr)	6740	403	94
TP (kg/yr)	13.4	2.32	82.6
TN (kg/yr)	118	32.3	72.7

Source: Northrop Engineers

Table 28 shows that the stretch treatment targets for suspended solids (TSS) and Nitorgen (TN) are exceeded by the stormwater management recommended, while the reduction for Phosphorus (TP) varies by catchment between 80.2% and 82.5%, just short of the 85% stretch target.

Northrop's assessment of the proposed bio-filtration basin sizes reveals that to achieve an 85% reduction in Phosphorous would involve an unreasonable size of filter media. Northrop illustrate that to increase the filter media from 2% to 5% would triple the media area required, and still not achieve the target of 85%. Northrop indicate that the increase in size would have minimal impact on treatment and as such, a filter area of 2% of the catchment size has been adopted.

4.8.4 Management of Potential Wetland Impacts

Hunter Water Corporation (HWC) requires that onsite detention be provided to limit post development flows to pre-developed flows for all storm events up to 1% AEP, for catchments flowing into Irrawang Swamp.

The BMT WBM Guidelines state that for catchments discharging directly into Irrawang Swamp, detention may not be required. The storage volume required to reduce post-developed flows to pre-development conditions up to 1% AEP, particularly on the steep slopes experienced on the Kings Hill site, were found to be excessive.

Instead, and in consultation with Alluvium, it was determined that a more appropriate outcome would be to limit the more frequent flows, up to and including the 40% AEP, to predeveloped flow rates. This is intended to retain the existing flow rates for the regular rain events, while rain events that occur less frequently than 40% AEP are not expected to have sufficient regularity to impact the day-to-day hydrological conditions within the wetland.

Therefore, detention for catchments flowing directly to the Irrawang Swamp has been provided to limit peak post developed flows to pre developed flows for events up to the 40% AEP.

In reference to Alluvium's assessment, Northrop also indicate that the major risks to the wetland, including increases in periods of increased inundation depth and reductions in seasonal drying patterns are unlikely to occur.

The report proposes a number of measures are put in place to manage water quantity and quality from development areas, including:

- Reducing stormwater runoff during frequent smaller rainfall events;
- Implement measures including disconnecting impervious areas, oversized BASIX rainwater tanks, infiltrating bio filtration systems, stormwater retention and harvesting systems;
- Ensuring that the majority of future runoff passes through appropriately sized stormwater retention/detention measures to protect ephemeral watercourses from erosion; and
- Management of stormwater runoff quality to prevent coarse sediment, dissolved nutrients, fine sediment and other diffuse source stormwater pollutants from impacting on the wetland ecology. This includes effective measures (including regular inspections) in the subdivision construction, building construction and post development Phases.

These measures have been incorporated into the Stormwater Management Plan that forms part of the Concept Proposal.

Additionally, a Wetland monitoring regime is proposed for Wetland 803 within the BMP for the Conservation Area, while a program for monitoring Wetland 804 (Irrawang Swamp) is provided within the Section 7 of the SIS.

The SIS notes that while impacts arising from the development of the KHD component of the KHURA on wetland 804 are predicted by Alluvium to be minor and negligible, an increased frequency and quantity of water flows into the Irrawang Swamp represents a similar kind of impact to those associated with the Grahamstown Dam augmentation project. The potential impacts associated with that project are monitored under the Irrawang Swamp Plan of Management (HWC 2012) which notably has as its objectives to:

- To restore the wetland to a desired state and eliminate, or least manage, existing threats.
- To manage the restored wetland for the long-term to address any potential degradation of the system in the future.

The monitoring component of the Irrawang Swamp Plan of Management focuses on the measurement of biological systems, with monitoring to cease following the completion of two 'post impact' monitoring events. The second 'post impact' monitoring event was completed in 2018 (Kleinfelder 2018), although the monitoring report made a recommended the continuation of the monitoring program.

The Proposal's impact on wetland 804 is likely associated with change in water inflow quantity and frequency. These impacts were modelled by Alluvium using annual water volume and frequency to predict these changes with the conclusion being a minimal impact on sensitive matters (i.e. areas of wetting and drying).

It is therefore proposed that the monitoring of wetland 804 is to focus on the measurement of actual change in water regimes. Variation in water depth and extent of cover is to be monitored within sensitive areas to test the conclusion that the Proposal is not likely to have any substantive impact over existing conditions. This monitoring is recommended in addition to the program implemented by HWC, which KHD supports to ensure the ongoing management of wetland 804.

The method, frequency and spatial focus of the recommended monitoring is presented in the SIS.

4.9 Access & Traffic

The Concept Proposal is informed by the following access and traffic assessments:

- For internal roads and intersection assessment specific to the Concept Proposal involving KHD's land - Northrop Engineers and Seca Solutions acting for KHD; and
- For external road network and traffic impact assessment based on entire KHURA - GHD acting for Port Stephens Council.

4.9.1 Internal Connectivity

Internal road and intersection configurations considered appropriate for the Concept Proposal are presented in **Sections 3.3.5.1 to 3.3.5.3**. In short, the proposed internal road network has been designed to incorporate major circulation routes for private vehicles, public transport, cyclists and pedestrians as well as local roads for access to local neighbourhoods and residential lots.

The main access point to the site is from a new grade separated interchange on the Pacific Highway. The internal road network will consist of two (2) collector roads, local streets, perimeter roads and laneways. The road network will include an 8m wide perimeter road at the interface of the development footprint and retained vegetation in line with NSW Rural Fire Service's Planning for Bush Fire Protection.

The minimum longitudinal road grade will be 0.5% while the maximum road grades will be as follows:

- Collector / bus route – 12%
- Local streets / perimeter roads / laneways – 25%

4.9.2 External Traffic Impacts

A Traffic Impact Assessment is contained in Section 6 of GHD's *Kings Hill Updated Traffic and Transport Study* of 16 April 2019. Key information from that report is reproduced hereunder.

The assessment identifies the likely future traffic scenarios for the road network surrounding Kings Hill in five-year increments from 2017 through to 2037.

For the purposes of modelling and estimating background traffic growth, development staging is assumed per **Table 29**. It is unlikely that there will be even growth across the precinct if the major infrastructure for the east and west precinct are not constructed concurrently. However, for the purposes of this traffic study, GHD assumed that there would be even growth from year five onwards at a rate of 1,136 lots every five years.

Table 29 GHD Assumed Development Staging for Traffic Modelling

Assessment Year	Lots (cumulative)	Assumptions
2022	400	Roads and Maritime have advised they will only allow 400 lots to be developed prior to the construction of the Pacific Highway Interchange. This figure assumes the interchange is not completed and any lots over and above 400 are not ready to be released within the next five years.
2027	1,536	Assuming even growth in the precinct of 1,136 lots every five years over 15 years
2032	2,672	
2037	3,810	Assuming that the precinct is fully developed within 20 years.

Source: GHD Kings Hill Updated Traffic and Transport Study

Future Midblock Performance
GHD assessed future midblock performance at five-year intervals between 2017 and 2037 for each of the following scenarios:

- A – Existing road network with background traffic growth;
- B – Kings Hill development traffic and background traffic growth without the proposed Pacific Highway interchange; and
- C – Kings Hill development traffic and background traffic with the proposed Pacific Highway interchange.

Scenario A – Existing Road Network with background Traffic Growth

Table 30 provides a summary of midblock performance during each peak period for the base network plus background traffic growth with no Kings Hill development.

Table 30 LoS Existing Road Network with Background Traffic Growth

Road	Capacity (veh/h)	2017 (Base)		2022		2027		2032		2037	
		AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
Newline Road	-	B	C	B	C	B	C	C	C	C	C
William Bailey Street	900	D	E	E	F	F	F	F	F	F	F
Adelaide Street	900	E	F	F	F	F	F	F	F	F	F
Seaham Road	900	D	F	E	F	F	F	F	F	F	F
Port Stephens Street	900	D	D	D	E	E	F	E	F	F	F
Pacific Highway	3,770	A	A	A	A	A	A	A	A	A	A
Six Mile Road	790	A	A	A	A	A	A	A	A	A	A

Source: GHD Kings Hill Updated Traffic and Transport Study

The midblock capacity assessment indicates that without Kings Hill, a number of roads within the study area are expected to operate at, or over, the theoretical midblock capacity in future years. The results highlight the following:

- Pacific Highway, Newline Road and Six Mile Road are likely to operate at a satisfactory LoS until 2037;
- Adelaide Street, William Bailey Street and Seaham Road currently operate at an unsatisfactorily LoS;
- Port Stephens Street is expected to operate at an unsatisfactory LoS from 2022.

Scenario B – Existing Road Network with Kings Hill without Interchange

Table 31 provides a summary of midblock performance during each peak under the existing road network configuration with 400 lots of Kings Hill development traffic during the future horizon years.

Table 31 LoS Kings Hill without Interchange

Road	Capacity (veh/h)	2017 (Base)		2022		2027		2032		2037	
		AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
Newline Road (two way)	-	B	C	C	D	E	E	E	E	F	F
William Bailey Street	900	D	E	E	F	F	F	F	F	F	F
Adelaide Street	900	E	F	F	F	F	F	F	F	F	F
Seaham Road	900	D	F	E	F	F	F	F	F	F	F
Port Stephens Street	900	D	D	D	E	F	F	F	F	F	F
Pacific Highway	3,770	A	A	A	A	A	A	A	A	A	A
Six Mile Road (two way)	790	A	A	A	A	A	A	A	A	A	A
Kings Hill Development Road (west)	900	-	-	A	A	F	F	F	F	F	F

Source: GHD Kings Hill Updated Traffic and Transport Study

The midblock capacity assessment indicates that with Kings Hill and no interchange (i.e only 400 lots):

- Pacific Highway and Six Mile Road are likely to operate at a satisfactory LoS until 2037;
- Adelaide Street, William Bailey Street and Seaham Road currently operate at an unsatisfactorily LoS;
- Newline Road and Port Stephens Street are expected to operate at an unsatisfactory LoS by 2027
- The western section of the proposed Kings Hill east-west collector road is expected to operate at LoS F by 2027 as a two-way two-lane road. However, the proposed interchange is expected be constructed by this time (Roads and Maritime requires this interchange to be provided following the development of 400 lots at Kings Hill).

Scenario C – Existing Road Network with Kings Hill with Interchange

Table 32 provides a summary of midblock performance during each peak under the Pacific Highway interchange upgrade with Kings Hill development traffic and background traffic growth.

Table 32 LoS Kings Hill with Interchange

Road	Capacity (veh/h)	Base		2022		2027		2032		2037	
		AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
Newline Road	-	B	C	C	C	C	D	D	D	D	D
William Bailey Street	900	D	E	E	F	F	F	F	F	F	F
Adelaide Street	900	E	F	F	F	F	F	F	F	F	F
Seaham Road	900	D	F	E	F	F	F	F	F	F	F
Port Stephens Street	900	D	C	D	E	F	F	F	F	F	F
Pacific Highway	3,770	A	A	A	A	B	B	B	C	C	C
Six Mile Road	790	A	A	A	A	A	A	A	A	A	A
Kings Hill Development Road (east)	900	-	-	A	A	D	E	F	F	F	F
Kings Hill Development Road (west)	900	D	D	A	A	A	A	B	B	C	C

Source: GHD Kings Hill Updated Traffic and Transport Study

The midblock capacity assessment indicates that with Kings Hill and an interchange:

- Pacific Highway, Newline Road and Six Mile Road are likely to operate at a satisfactory LoS until 2037;
- Adelaide Street, William Bailey Street and Seaham Road currently operate at an unsatisfactorily LoS;
- The eastern section of the proposed Kings Hill east-west collector road would likely operate at an unsatisfactory LoS by 2027 as a two-way two-lane road (one lane in each direction). Two traffic lanes each way would be required to improve mid-block performance at this location.
- The western section of the proposed Kings Hill east-west collector road would operate satisfactorily in to 2037, as a two-way two-lane road (one traffic lane in each direction).

Future Intersection Performance

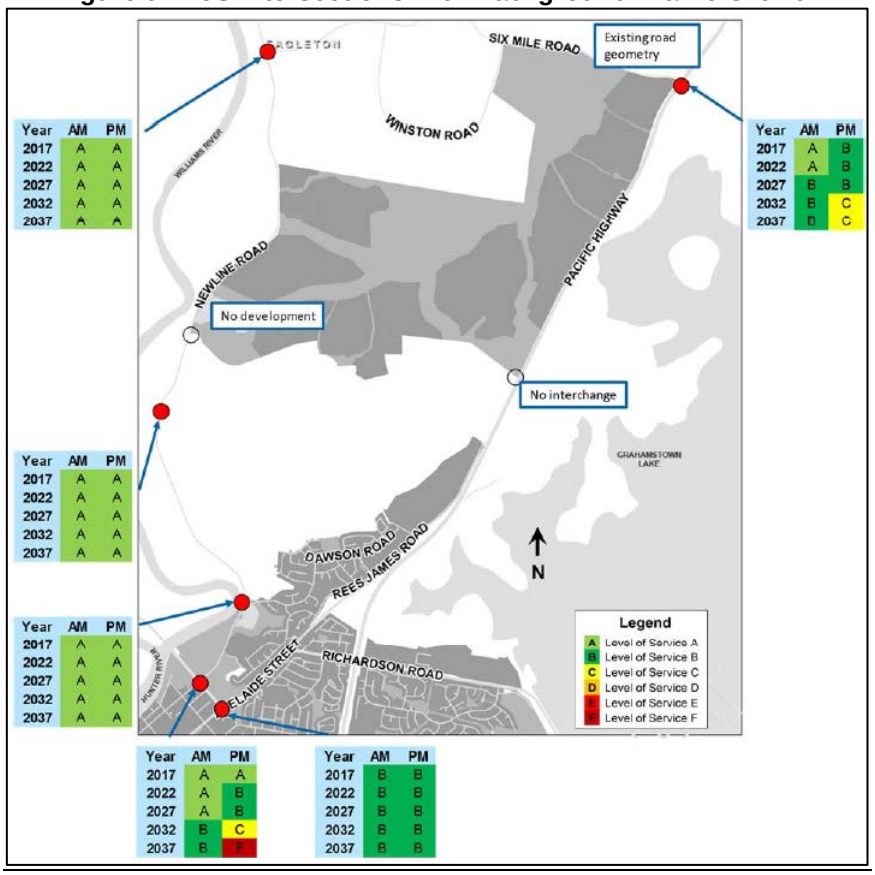
GHD modelled the operational performance of all intersections impacted by Kings Hill using SIDRA 7 Intersection analysis for the period 2017 and 2037 for each of the following scenarios:

- A – Existing road network with background traffic growth;
- B – Kings Hill development traffic and background traffic growth without the proposed Pacific Highway interchange; and
- C – Kings Hill development traffic and background traffic with the proposed Pacific Highway interchange.

Scenario A – Existing Road Network with background Traffic Growth

A summary of the SIDRA modelling results for the Scenario A is shown in **Figure 92**.

Figure 92 LoS Intersections with Background Traffic Growth



Source: GHD Kings Hill Updated Traffic and Transport Study

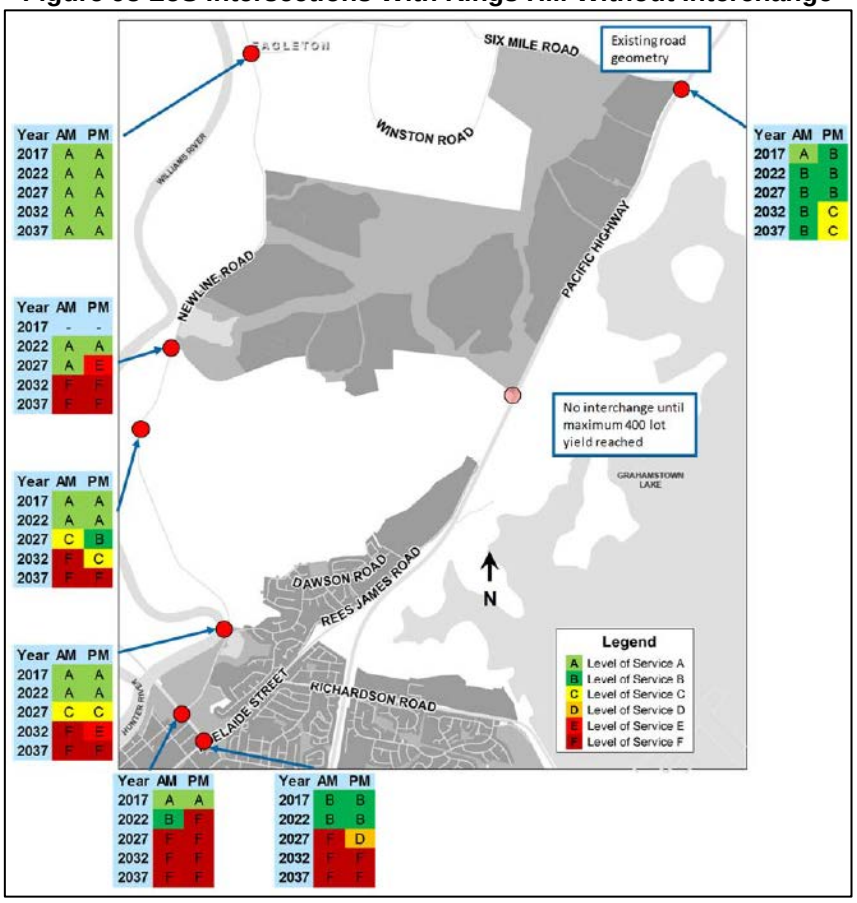
The SIDRA intersection modelling results, under Scenario A, indicates the following:

- The Newline Road/Seaham Road/William Bailey Street roundabout is expected to operate at LoS F in the PM peak by 2037.
- All other intersections are expected to operate with a satisfactory LoS in 2037.

Scenario B – Existing Road Network with Kings Hill without Pacific Highway interchange

A summary of the SIDRA modelling results for the Scenario B is shown in **Figure 93**.

Figure 93 LoS Intersections With Kings Hill Without Interchange



Source: GHD Kings Hill Updated Traffic and Transport Study

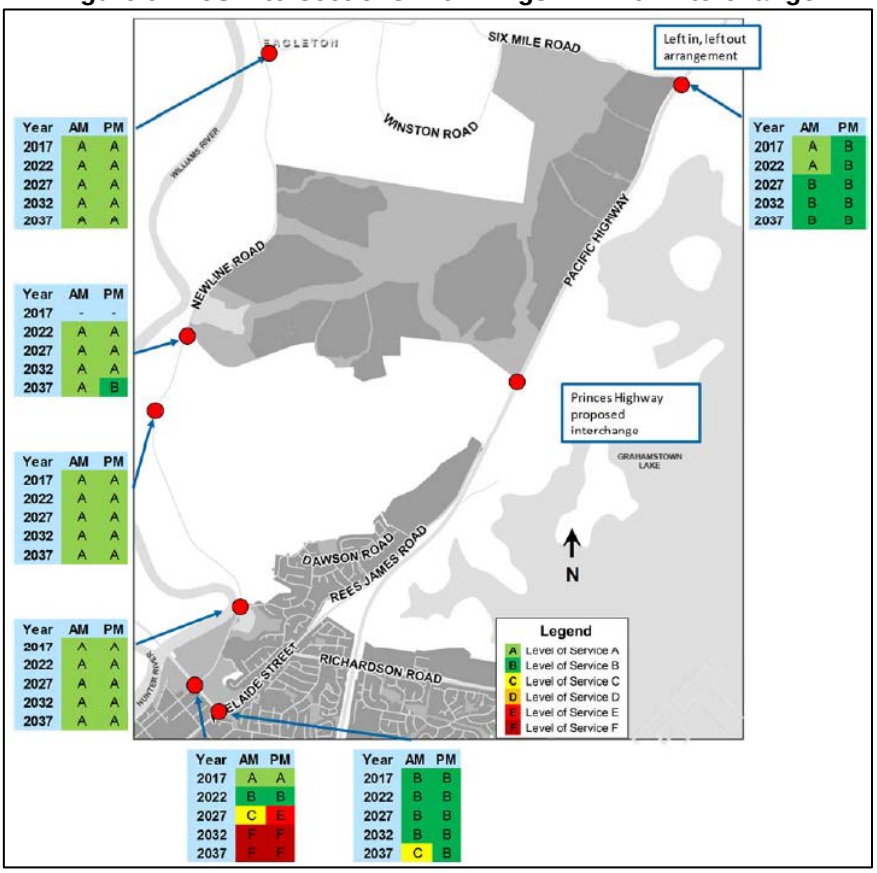
The SIDRA modelling results for Scenario B indicates the following:

- The Newline Road/William Bailey Street roundabout is expected to operate at LoS F by 2022:
- The Adelaide Street/William Bailey Street intersection is is expec7ted to operate at LoS F by 2027:
- The Newline Road/Kings Hill access is expected to operate at an unsatisfactory LoS E (as a priority T-intersection) by 2022:
- The following intersections would operate at an unsatisfactory LoS F by by 2032:
  - Newline Road/Beaton Avenue
  - Newline Road/Waste Management Centre access

Scenario C – Existing Road Network with Kings Hill with Pacific Highway interchange

A summary of the SIDRA modelling results for the Scenario C is shown in **Figure 94**.

Figure 94 LoS Intersections with Kings Hill with Interchange



Source: GHD Kings Hill Updated Traffic and Transport Study

The SIDRA results, under Scenario C, indicate the following:

- The Newline Road/William Bailey Street roundabout is expected to operate at an unsatisfacory LoS E (PM peak only) by by 2027 and at LoS F in 2032 (AM and PM peak):
- All other intersections are expected to operate at a satisfactory LoS C or better by 2037.
- The proposed left-in/left-out arrangement at the Pacific Highway/Six Mile Road intersection is expected to improve the intersection performance, as right turning vehicles would be forced to use the proposed Pacific Highway interchange.

Overall, the SIDRA modelling indicates that:

- the proposed Pacific Highway interchange would significantly reduce traffic congestion compared to the no-interchange scenario (Scenario B).
- an improvement to the Newline Road/William Bailey Street would be required by 2027 (Scenario B). Further assessment by GHD indicates that the following improvements would be required:
    - Replacing the roundabout with a traffic signal controlled intersection; and
    - Widening approaches to include left hand turn slip lanes and dedicated right hand turn lanes at each approach.

GHD further summarise the road network infrastructure upgrades required in **Table 33** and **Table 34**.

Table 33 Scenario A – Upgrades due to Background Traffic (without Kings Hill)

Horizon Year (Trigger Point)	Required Infrastructure Upgrades
2017	Adelaide Street, William Bailey Street and Seaham Road currently operate at an unsatisfactorily midblock LoS.
2023	No additional infrastructure requirements.
2027	No additional infrastructure requirements.
2032	Implementation of capacity enhancements for Newline Road due to LoS E conditions
2037	William Bailey Street/Newline Road/Port Stephens Street intersection operates over capacity. Intersection upgrade required.

Source: GHD Kings Hill Updated Traffic and Transport Study

Table 34 Scenario C – Upgrades due to both Background Growth and Kings Hill

Horizon Year	No. of Lots (Trigger Point)	Required Infrastructure Upgrades
2017	0	• Adelaide Street, William Bailey Street and Seaham Road currently operate at an unsatisfactorily midblock LoS.
2022	400	• Proposed Pacific Highway interchange to be provided, as required by Roads and Maritime following the development of 400 residential lots at Kings Hill. • Modify the Six Mile Road/Pacific Highway intersection to allow the left-in, left-out movements only. • Kings Hill east-west collector road to be provided with a single traffic lane in each direction (at both the western and eastern ends of this road).
		• Adelaide Street, William Bailey Street, Seaham Road and Port Stephens Street are expected to operate at an unsatisfactorily midblock LoS, with the proposed Pacific Highway interchange.
2027	1,536	• Two traffic lanes in each direction required for the eastern section of the Kings Hill east-west collector road. • Implementation of capacity enhancements for Newline Road due to LoS E conditions • William Bailey Street/Newline Road/Port Stephens Street intersection operates over capacity. Intersection upgrade required.
2032	2,672	• Two traffic lanes in each direction along the eastern section of the proposed Kings Hill east-west collector road.
2037	3,810	• No additional infrastructure requirements.

Source: GHD Kings Hill Updated Traffic and Transport Study

Impact of Pacific Highway Interchange
Upon commissioning of the Pacific Highway interchange, and when the north-south collector road is constructed, it is planned to modify the Six Mile Road/Pacific Highway intersection to allow the left-in, left-out movements only.

GHD advise that this arrangement would prevent access between the Pacific Highway southbound carriageway and Six Mile Road. Access between the Pacific Highway southbound carriageway will be via the Pacific Highway/Kings Hill interchange and the new Six Mile Road/Kings Hill road connection in Kings Hill. This arrangement would result in the following:

- Additional travel distance of approximately 4km for vehicles travelling southbound on the Pacific Highway in order to access Six Mile Road; and
- A minor increase in travel distance (through the Kings Hill site) for vehicles travelling from Six Mile Road to the Pacific Highway southbound carriageway.

In addition, upon commissioning of the Pacific Highway interchange, the existing Riding for the Disabled access point will be relocated to be accessed via an internal road linking with the new interchange.

A broader public benefit is, however, a considerable improvement in traffic safety by removal of an at-grade intersection that currently enables crossing through a break in the median to join a 110km/h signposted speed zone.

4.10 Road Traffic Noise

Long-term attended noise monitoring was completed by **EMM Pty Ltd** along the entire URA frontage to the Pacific Highway to establish existing ambient noise levels and road traffic noise exposure across the subject site (see **Attachment O**).

4.10.1 Existing Traffic Levels

Measured noise levels were assessed with reference to Clause 102 of the infrastructure SEPP (2007) and DPIE's "*Development near Rail Corridors and Busy Roads – Interim Guidelines"* (2008). Road traffic noise levels were predicted across the site at hypothetical single story dwellings. SEPP (Infrastructure) 2007 relates to roads having an annual average daily traffic volume of 40,000 vehicles, although it can also be applied to roads with 20,000 to 40,000 vehicles daily.

The traffic volumes for the Pacific Highway were obtained from 7-day tube traffic counts taken immediately south of the Six Mile Road intersection, while the road traffic volumes for the proposed interchange were taken from *Kings Hill Interchange & Drainage Channel - Traffic & Construction Noise Assessment* prepared by Wilkinson Murray dated 13 October 2017. Modelled traffic volumes are outlined by EMM in **Table 35**:

Table 35 Road Traffic Volumes

Roadway	Direction	Lane	Day (7am to 10pm)			Night (10pm to 7am)			% Heavy vehicles	
			Light	Heavy	Total	Light	Heavy	Total	Day	Night
Pacific Highway	Northbound	Kerb	5069	1678	6747	620	450	1070	25	42
		Middle	1653	503	2156	86	33	119	23	28
	Southbound	Kerb	4952	1873	6825	610	565	1175	27	48
		Middle	1698	203	1901	96	17	113	11	15
	All	All	13372	4258	17630	1412	1066	2478	24	43
Interchange on-ramp	Northbound	-	116	6	122	22	1	23	5	4
	Southbound	-	1715	90	1805	327	17	344	5	5
Interchange off-ramp	Northbound	-	1691	89	1780	323	17	340	5	5
	Southbound	-	108	6	114	21	1	22	5	5

Source: EMM Pty Ltd

Assessment Criteria

Clause 102(3) of the SEPP (Infrastructure) 2007 addresses the impact of road noise or vibration on non-road development by specifying the following criteria:

> *If the development is for the purposes of a building for residential use, the consent authority must not grant consent to the development unless it is satisfied that appropriate measures will be taken to ensure that the following LAeq levels are not exceeded:*
>
> > *(a) in any bedroom in the building - 35 dB(A) at any time between 10 pm and 7 am,*
> >
> > *(b) anywhere else in the building (other than a garage, kitchen, bathroom or hallway) -40 dB(A) at any time.*

Unattended road traffic noise monitoring

Two (2) unattended noise loggers were placed approx. 1.4 km south of the intersection of the Pacific Highway and Six Mile Road, while two (2) were placed approx. 3 km south of the intersection of the Pacific Highway and Six Mile Road. The microphones were positioned approx. 50 m and 100 m from the Pacific Highway, respectively. The results are noted in **Table 36**.

Table 36 Unattended Road Traffic Noise Measurements

Location	Road section	Assessment period[1]	Measured noise level, dB
L1 – Pacific Highway South (50 m from Pacific Highway)	Between Six Mile Road and Rangers Road	Day	63 $L_{Aeq,15\ hour}$
		Night	60 $L_{Aeq,9\ hour}$
L2 – Pacific Highway South (100 m from Pacific Highway)	Between Six Mile Road and Rangers Road	Day	See Note 2
		Night	See Note 2
L3 – Pacific Highway North (50 m from Pacific Highway)	Between Six Mile Road and Rangers Road	Day	66 $L_{Aeq,15\ hour}$
		Night	63 $L_{Aeq,9\ hour}$
L4 – Pacific Highway North (100 m from Pacific Highway)	Between Six Mile Road and Rangers Road	Day	63 $L_{Aeq,15\ hour}$
		Night	60 $L_{Aeq,9\ hour}$

otes: 1. As per the RNP the day period is from 7:00 am to 10:00 pm and the night period is from 10:00 pm to 7:00 am.
2. The noise logger at location L2 failed to collect any valid data due to a battery failure.

Source: EMM Pty Ltd

Attended road traffic noise monitoring

Attended measurements were undertaken by EMM in accordance with AS 1055-1997 *Description and Measurement of Environmental Noise, Parts 1, 2 and 3*. The results are noted in **Table 37**.

Table 37 Attended Road Traffic Noise Measurements

Location	Coordinates, MGA 56H	Start time	Measured noise level dB			Comments
			L_{A90}	L_{Aeq}	L_{Amax}	
L1 – Pacific Highway South (50 m from Pacific Highway)	386207 E, 6378515 S	11:27	58	63	75	Consistent traffic on Pacific Highway. Frequent bird noise and insects. Occasional aircraft noise.
L2 – Pacific Highway South (100 m from Pacific Highway)	386182 E, 6378539 S	11:44	57	63	73	Consistent traffic on Pacific Highway. Frequent bird noise and insects. Occasional tractor noise.
L3 – Pacific Highway North (50 m from Pacific Highway)	387062 E, 6379981 S	12:22	61	65	77	Consistent traffic on Pacific Highway Consistent insects. Frequent bird noise
L4 – Pacific Highway North (100 m from Pacific Highway)	387030 E, 6380006 S	13:19	57	60	67	Consistent traffic on Pacific Highway Consistent insects. Frequent bird noise

Source: EMM Pty Ltd

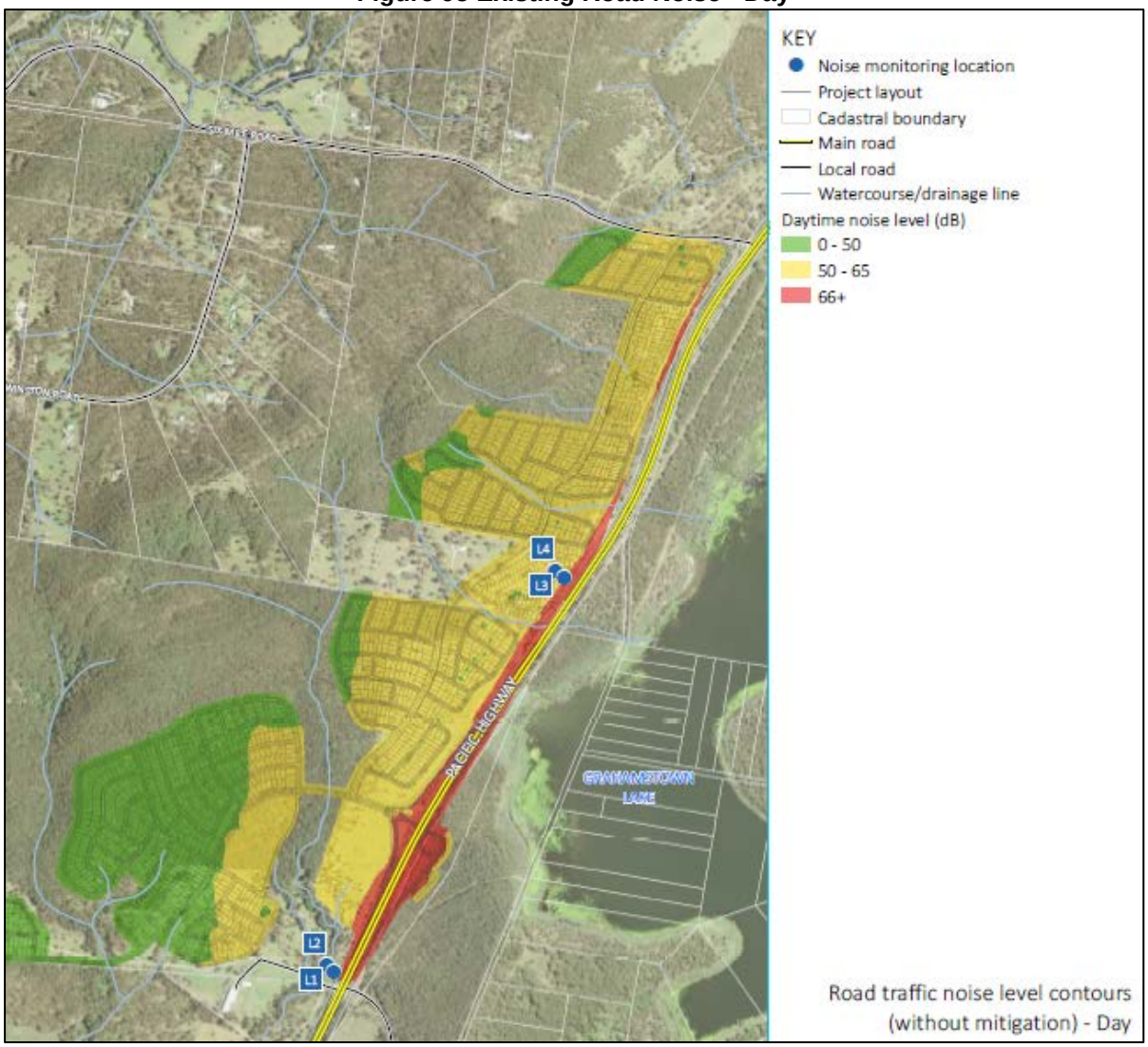
Results of the operator-attended noise survey indicate that road traffic noise is the main contributor to ambient noise levels with some contribution from natural sounds and aircraft noise.

4.10.2 Existing Road Traffic Noise

The EMM monitoring results were applied to a theoretical lot layout within the development footprint of the Concept Proposal.

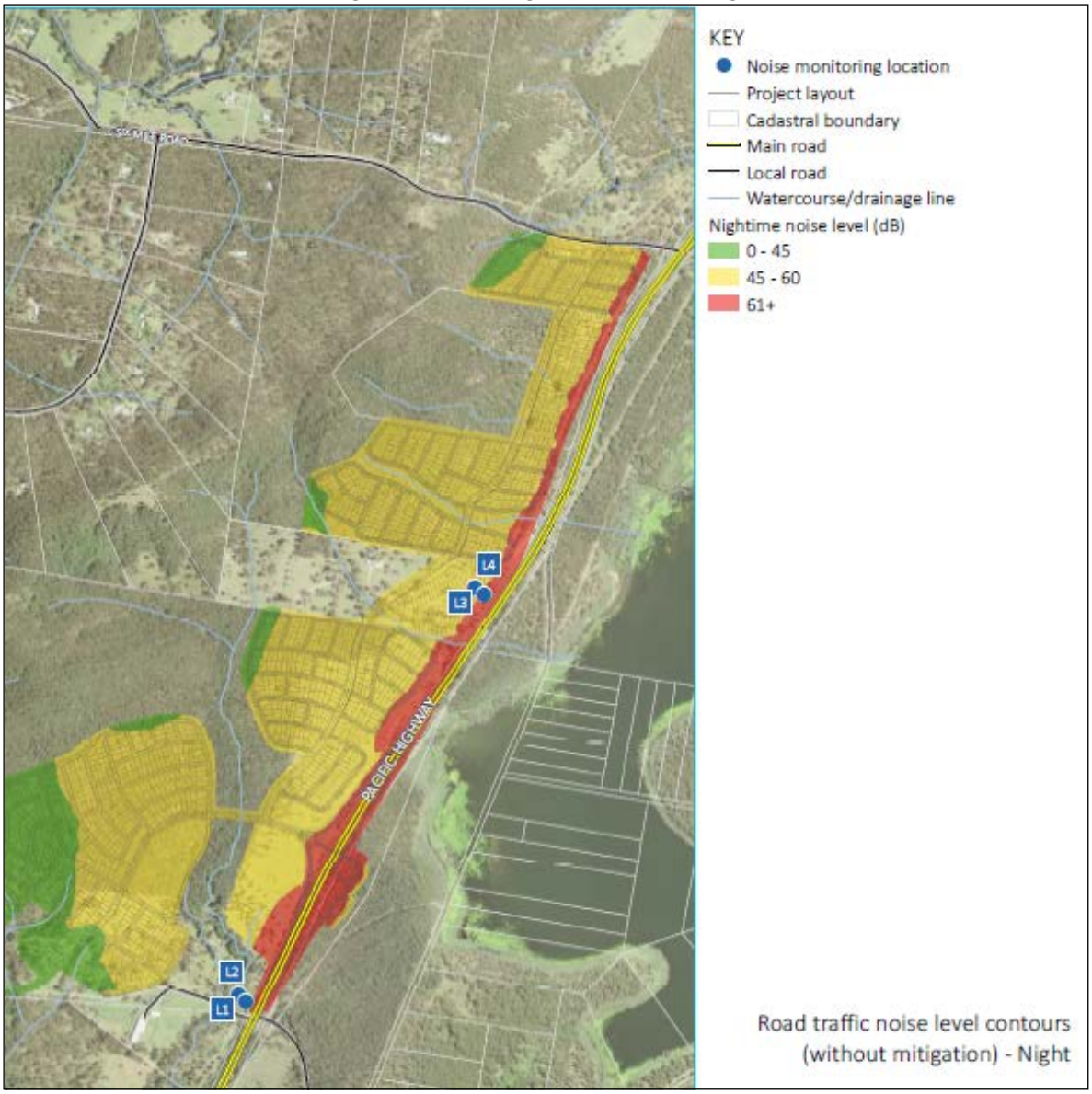
The assessment indicates that road traffic noise levels at the nearest residences in adjoining Gwynvill land holdings and the northern KHD land holdings were above the relevant internal noise goals. External road traffic noise predictions before the application of mitigation are presented for the daytime and night time periods in **Figures 95 and 96**.

Figure 95 Existing Road Noise - Day



Source: EMM Pty Ltd

Figure 96 Existing Road Noise - Night



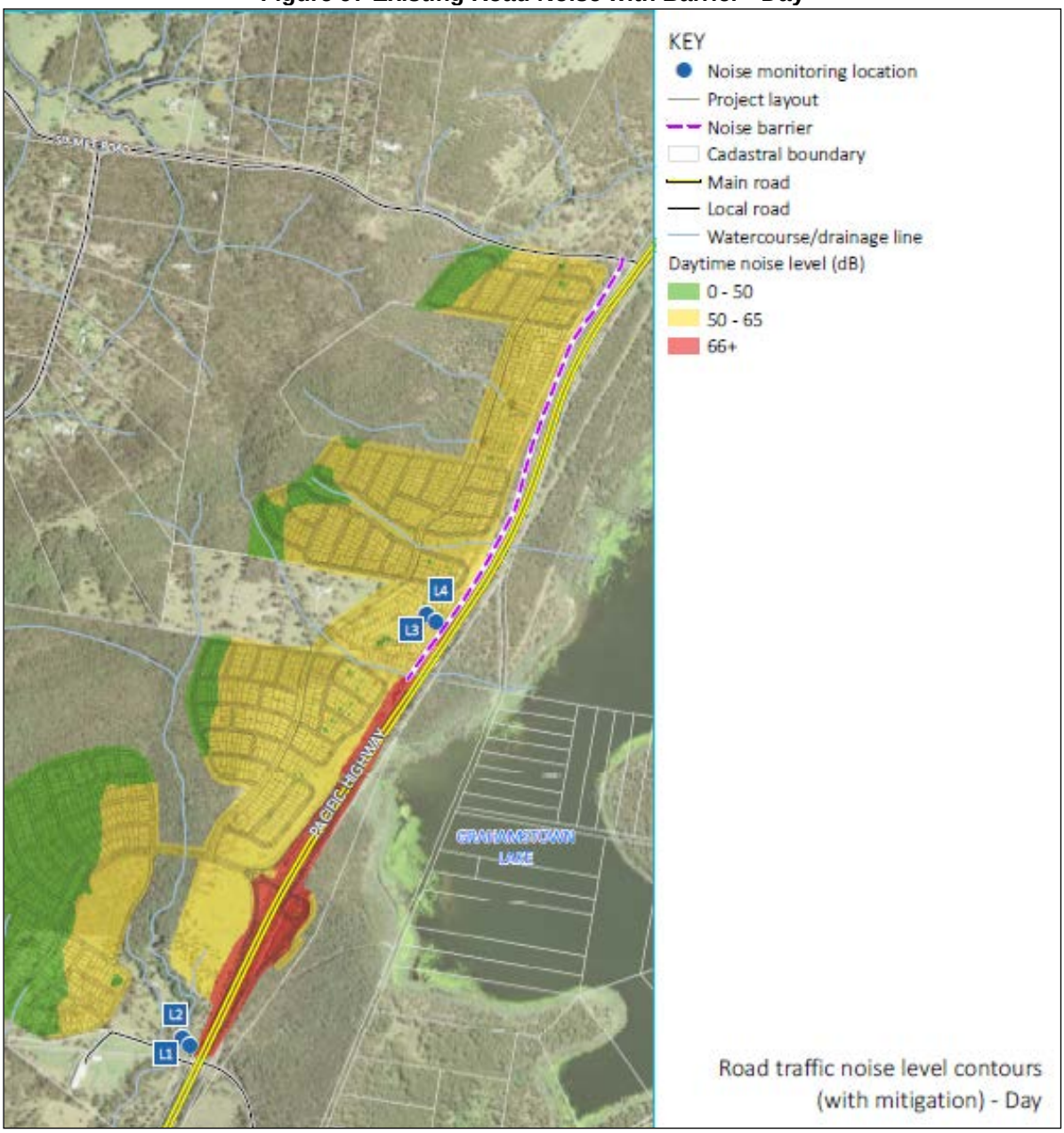
Source: EMM Pty Ltd

4.10.3 Management of Road Traffic Noise

A barrier spanning the eastern boundary of these sites was modelled in order to reduce road traffic noise levels in these areas. The barrier is recommended to extend from the north eastern corner of the northern KHD land holding, spanning the eastern boundary to the south eastern corner of the southern Gwynvill land holding. It is noted that the acoustic performance of the barrier would be most effective if the barrier was located on the eastern boundary of the site, as close to the road reserve as possible.

External road traffic noise predictions after the inclusion of a 2.4 m high barrier are presented for the daytime and night-time periods in **Figures 97 and 98.**

Figure 97 Existing Road Noise with Barrier - Day

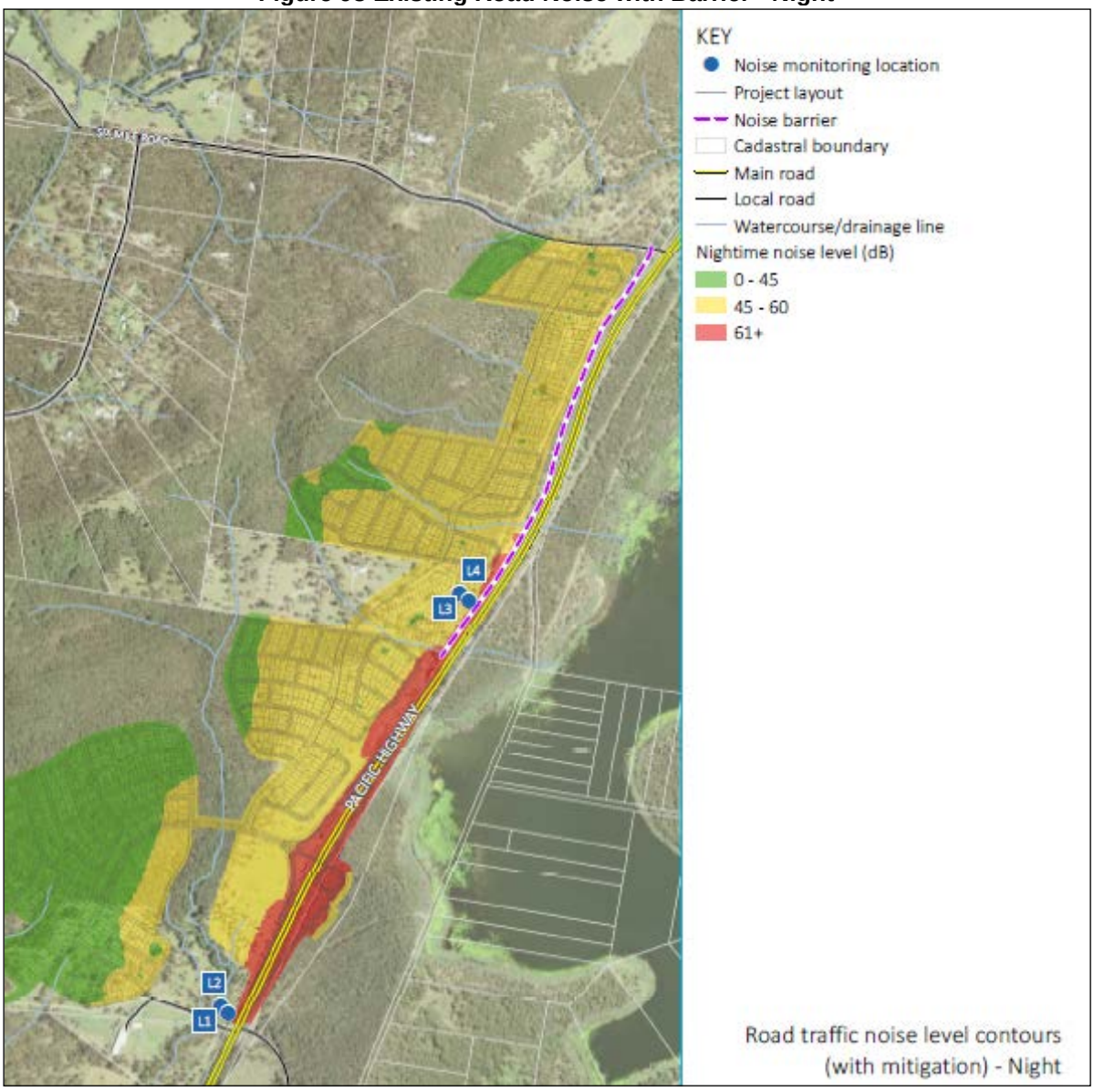


Source: EMM Pty Ltd

The barrier is assumed to be continuous and contain no gaps, constructed from an appropriate material, such as packed earth, concrete, lapped and capped timber or a combination of these, and be a minimum height of 2.4 m. Consideration should also be given to the durability of the barrier material.

The southern KHD land holding was found to be afforded acoustic shielding from the proposed interchange topography, along with greater separation distances from the road to the nearest residences. Further, extending the proposed barrier to this area was found to be ineffective due to the site topography. As such, it was concluded that a barrier was not required in this area.

Figure 98 Existing Road Noise with Barrier - Night



Source: EMM Pty Ltd

Australian Standard AS 3671-1989 *Acoustics - Road traffic noise intrusion - Building siting and construction* is concerned with the reduction of road traffic noise intrusion in buildings in areas near major roads. This standard provides guidelines for determining the type of building construction necessary to achieve acceptable internal noise levels.

Table 38 summarises the recommended building construction categories outlined in AS 3671-1989.

Table 38 Acoustic Construction Standards

Category Type	Definition	Approximate traffic noise reduction
Category 1	Standard construction; openings, including open windows and doors may comprise of up to 10% of the exposed facade.	≤ 10 dB
Category 2	Standard construction, except for light-weight elements such as fibrous cement, metal cladding or all-glass facades. Windows, doors and other openings must be closed.	10 dB – 25 dB
Category 3	Special construction. Windows, doors and other openings must be closed.	25 dB – 35 dB
Category 4	Specialist acoustic advice must be sought.	>35 dB

Source: EMM Pty Ltd

Where the required external noise reduction is less than 10 dB, standard (i.e. Category 1) construction techniques are expected to reduce internal noise levels to recommended values.

In cases where a noise reduction in the range of 10-25 dB is required, Category 2 construction techniques are expected to provide adequate attenuation to reduce road traffic noise levels to at, or below, relevant internal goals.

Similarly, if the required noise reduction is in the range of 25-35 dB, Category 3 construction techniques would be expected to reduce internal noise to an acceptable level.

Results of this analysis are described in **Table 39**.

Table 39 Noise Reduction Required to Achieve Noise Criteria

Time period/Type of occupancy	Required noise reduction	Relevant lots	Architectural treatment
Daytime (Living Areas)	Up to 10dBA	Lots in the green zone (<50dBA)	Construction category 1 (i.e. standard construction)
	10 dBA – 25 dBA	Lots in the yellow zone (50-65dBA)	Construction category 2 (i.e. standard construction with windows/doors closed)
	25 dBA – 35 dBA	Lots in the red zone (>65dBA)	Further consideration or Construction category 3 (i.e. special construction)
Night-time (Bedrooms)	Up to 10dBA	Lots in the green zone (<45dBA)	Construction category 1 (i.e. standard construction)
	10 dBA – 25 dBA	Lots in the yellow zone (45-60dBA)	Construction category 2 (i.e. standard construction with windows/doors closed)
	25 dBA – 35 dBA	Lots in the red zone (>60dBA)	Further consideration or Construction category 3 (i.e. special construction)

Source: EMM Pty Ltd

Mitigation recommendations apply to single storey dwellings. The upper floors of double storey (or higher) dwellings will need further consideration and possibly additional mitigation. Multiple storey dwellings should be assessed on a case by case basis.

Figure 98 shows that there are a number of potential lots facing the Pacific Highway that may require further consideration given that the 60 dB noise contour marginally encroaches into the potential lots. Notwithstanding, this does not necessarily indicate the need for category three construction on these allotments.

Applying one or more of the following recommendations can ensure that Category 2 construction on these allotments can satisfy the relevant internal noise goals outlined in DPIE's "*Development near Rail Corridors and Busy Roads – Interim Guidelines"*.

These recommendations include, but are not limited to, the following:

- Locate dwellings on each allotment as far as possible from the Pacific Highway.
- Minimise the size and number of windows facing the Pacific Highway.
- Locate noise insensitive areas such as the kitchen, storage areas and laundry toward the Pacific Highway.
- Use construction techniques that focus on sealing gaps around windows, doors, ceiling spaces, etc.
- Use thicker glass or double glazing on windows susceptible to excessive noise intrusion from the Pacific Highway.
- Use solid core doors and appropriate door seals on doors susceptible to excessive noise intrusion from the Pacific Highway.

Appropriately applying one or more of the recommendations can ensure that category two construction can satisfy the relevant internal noise goals at these locations.

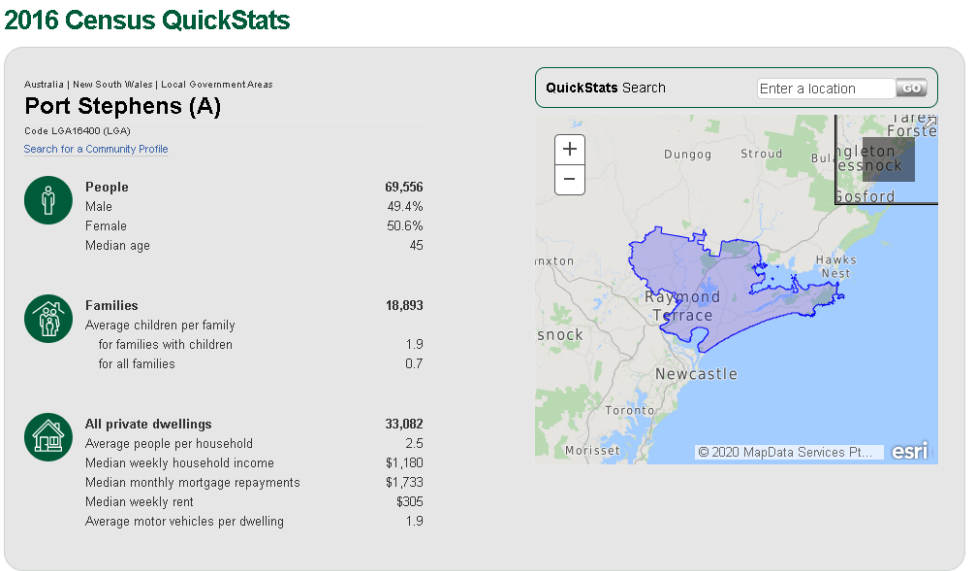
4.11 Social and Economic Impact

The site forms a part of the Kings Hill URA. As a consequence, the area has been strategically identified by Council and the NSW government for population growth and change.

4.11.1 Projected Dwelling and Population Increase

The Concept Proposal targets the provision of 1,900 dwellings, and with an average household occupancy ratio is 2.5 persons per dwelling (Census 2016), the Concept Proposal will become home to some 4,750 people. Double that population is anticipated to occur with the KHURA over the next 15 years.

Figure 99 ABS 2016 Census Statistics



Source; Australian Bureau of Statistics

4.11.2 Expected Demographic and Social Infrastructure Required

The ABS Census 2016 found that over 72% of the Port Stephens population are families. It is therefore expected that first residents are likely to be educated and qualified young families as first home buyers, and those with families seeking to upgrade to larger dwellings by relocating from within Raymond Terrace or other parts of the LGA.

This demographic will tend to be more active and able, with walking and/or cycle likely to be a popular, cost effective mode of local transport particularly for journeys to school and play areas etc. Younger families will therefore seek properly furnished and passively supervised recreation areas, with off-road walking and cycling paths to provide a safe environment for children to play and explore, conducive to the use of prams, walking of pets (off-leash areas etc.), with the benefit of social interaction.

The topography alongside the proposed collector road, which links between various land uses within the Concept Proposal (schools, town centre, bus stops, parks and opens spaces), consists mainly of gentle grades which are conducive to pedestrian, wheel chair and cycle activity. Properly furnished and interconnected, pathways will reduce the need for local car journeys (and perhaps 2nd car ownership), encourage people to be active, and in environmental terms, will reduce the number of vehicle kilometres travelled each year.

As the development matures, it is expected that the socio economic profile of residents will begin to diversify consistent with broader socio economic and aging population trends across Port Stephens and the Lower Hunter region.

The Concept Plan recognises that a key social sustainability measure is to cater for housing suitable for various stages of the lifecycle. While the Concept Proposal may initially cater to young families seeking affordable housing in an environment conducive to walking and cycling, grandparents are equally likely to locate in areas close to family and grandchildren, with the convenience of potentially living close by to support the family with school, sporting and cultural activities, and thus remaining more connected with the family and social networks.

A common question raised during the community consultation sessions held by KHD was whether the development would cater for ‘down sizers/empty nesters’ by the provision of small lot housing within a walk of conveniences, and aged care. There was a detectable degree of anxiety around the availability of affordable housing choices particularly by ‘baby boomers’ concerned about the increase in demand by an ageing population.

More broadly, development in line with the Concept Proposal will create demand for recreational facilities, education, health infrastructure, emergency services, public transport, open space and community facilities.

Currently, such facilities are located in Raymond Terrace or further afield and initially, it is expected and accepted that future residents of Kings Hill will be dependent upon lower and higher order facilities and services provided in Raymond Terrace. As future stages develop, however, the capacity for private sector local services and facilities to become established within the KHURA will increase although over time, future residents will continue to obtain higher order facilities, services and employment in Raymond Terrace, Heatherbrae, RAAF Base Williamtown and Newcastle Airport and the centres of Newcastle and Maitland.

4.11.3 Economic Impact

The Concept Proposal constitutes about 65% of the KHURA, and approval of the Concept Proposal will provide the necessary confidence for the proponent, stakeholders, and other landowners to increase and accelerate investment in the URA. This will in turn activate the potential identified by MacroPlan in their Economic Assessment of 2019 (see **Attachment S**).

MacroPlan indicates that when completed, the Kings Hill URA is estimated to provide a direct $140 million in value into the local economy annually, with expenditure on upfront infrastructure expected to total $105.4 million whilst the cost of the construction of the development is expected to total $1.1 billion (2018 dollars).

Construction of the development alone is expected to generate 177 full-time equivalent jobs per annum directly in the construction industry over a 15-year period, and ongoing full-time employment for some 279 residents when the development is completed. Investment from businesses located in the KHURA has the potential to provide direct ongoing employment for at least 885 people.

Direct regional benefits attributable to the early release of the KHURA include:

- a timely addition of 3,500+ dwellings in a relatively difficult and constrained housing environment, providing affordable housing choices central to the region's main employment locations;
- a strengthening and diversification of the local economy – countering the region's reliance on traditional industries such as manufacturing and mining, which currently support the majority of the region's workforce but are anticipated to recede in importance over the coming decade; and
- an improved retention of young working residents – through its provision of employment opportunities in construction, professional services, education and retail trade industries.

Representing about 65% of development proposed within the KHURA, the scale of the Concept Proposal on its own will have a significant and sustainable positive effect on the social and economic aspects for Kings Hill, the Port Stephens LGA, and the Lower Hunter Region.

These positive effects include:

- Providing the market place with diversity and greater choice in terms of location (close to employment areas of Raymond Terrace, Tomago/Heatherbrae, Williamtown airport) and housing in Port Stephens
- Increased supply of modern, energy efficient and adaptable housing;
- Adding to the critical mass of population required to sustain services and facilities;
- Additional users of existing public and private infrastructure in Raymond Terrace;
- Create a population mass suitable to sustain and/or encourage new services including public transport;
- Increased numbers of children available for the proposed school;
- Greater availability of affordable housing for low income earners and first home buyers in Port Stephens and beyond;

- An increase in population will increase the pool of volunteers to serve community organisations in the Raymond Terrace area such as Volunteer Fire Service, Riding for Disabled, State Emergency Services etc.
- Greater amount of Local Contributions, based on the Kings Hill Local Contributions Plan that ensures community infrastructure is online expediently; and
- An increase in the employment generation likely from the Urban Release Area as a result of the multiplier effect.

5.0 DEVELOPMENT ASSESSMENT AND COMPLIANCE

Commonwealth and State legislation relevant to the development assessment process are set out in **Section 5.1** and **Section 5.2**, while an appraisal of the Concept Proposal (including the initial stage proposed to be carried out) is provided in the context of the assessment criteria of the Environmental Planning and Assessment Act 1979 is provided in **Section 5.3**.

5.1 Commonwealth Legislation

5.1.1 Environmental Protection & Biodiversity Conservation Act 1999

The purpose of the EPBC Act is to ensure that actions likely to cause a significant impact on Matters of National Environmental Significance (MNES) undergo a process of assessment. Under the EPBC Act, an action includes a Proposal, undertaking, development or activity that may impact MNES. An action that 'has, will have or is likely to have a significant impact on a MNES' is deemed to be a 'controlled action' and may not be undertaken without prior approval from the Commonwealth Minister for the Department of the Environment and Energy (DoEE).

MNES categories listed under the EPBC Act potentially relevant to this application are:

- Wetlands of international importance (Ramsar wetlands);
- Threatened species and ecological communities (Section 18 and 18A);
- Migratory species;
- Commonwealth marine

The first step in considering MNES protected under the EPBC Act (e.g. Section 18 and 18A) is a self-assessment performed in accordance with the Significant Impact Guidelines 1.1 - Matters of National Environmental Significance (DoE 2013). This is performed to determine if there is likelihood for an action to have a significant impact on MNES.

Regulatory approval from the Commonwealth Minister for the Environment is required to be sought by the proponent for actions that have, or are likely to have, a significant impact on MNES prior to works commencing on the site. The decision to refer an action must have due regard for directions specified under Section 68 of the Act.

5.2 State Legislation

5.2.1 Environmental Planning & Assessment Act 1979

The *Environmental Planning & Assessment Act 1979 (EP&A Act)* is the legislation under which planning in NSW takes place. The main parts of the EP&A Act that relate to development assessment and approval are *Part 4* (Development Assessment) and *Part 5* (Environmental Impact Assessment) development assessment.

Clause 1.3 of the Act sets out the objectives, and those relevant to this application are:

> *The objects of this Act are as follows—*
>
> *(a) to promote the social and economic welfare of the community and a better environment by the proper management, development and conservation of the State's natural and other resources,*

(b) to facilitate ecologically sustainable development by integrating relevant economic, environmental and social considerations in decision-making about environmental planning and assessment,
(c) to promote the orderly and economic use and development of land,
…
(e) to protect the environment, including the conservation of threatened and other species of native animals and plants, ecological communities and their habitats,
(f) to promote the sustainable management of built and cultural heritage (including Aboriginal cultural heritage),
(g) to promote good design and amenity of the built environment,
…
(i) to promote the sharing of the responsibility for environmental planning and assessment between the different levels of government in the State,
(j) to provide increased opportunity for community participation in environmental planning and assessment.

Clause 1.7 of the Act indicates that EP&A Act has effect, subject to the provisions Part 7 of the *Biodiversity Conservation Act 2016* (see **Section 5.2.4**) and *Part 7A Fisheries Management Act 1994* (see **Section 5.2.6**) which provide additional requirements for assessments, consents and approvals made under the EP&A Act.

Clause 4.5(b) of the Act confers that the consent authority for regionally significant development, as defined by an environmental planning instrument, is the regional planning panel for that area.

Schedule 7 of *State Environmental Planning Policy (State and Regional Development) 2011* declares this development as regionally significant, as it is general development valued at over $30 Million. The consent authority for this application will be the Regional Planning Panel for the Hunter and Central Coast region.

Clause 4.15 of the Act requires a consent authority to take into consideration a range of matters listed under cl.4.15(1) to the extent they are matters relevant to the development the subject of a development application (see **Section 5.3 below**).

5.2.3 Biodiversity Conservation (Savings and Transitional) Regulation 2017

The *Biodiversity Conservation (Savings and Transitional) Regulation 2017* provides savings provisions for identified development in specific areas in the transition to the *Biodiversity Conservation Act 2016*. *Section 28* of this Regulation provides that the former planning provisions continue to apply to the determination of a pending or interim planning application.

Section 27 (f) identifies a pending or interim planning application as an application for development consent under Part 4 of the EP&A Act made within an identified interim designated area and within 15 months after the commencement of the Act. The Port Stephens Local Government Area is identified as an interim designated area.

This application was lodged with the Consent Authority prior to the date of 24 November 2018 and is therefore considered under the planning provisions of the now repealed *Threatened Species Conservation Act 1995* as opposed to the *Biodiversity Conservation Act 2016*.

5.2.4 NSW Biodiversity Conservation Act 2016

The BC Act and supporting regulations establish a modern and integrated legislative framework for land management and conservation in NSW. The purpose of the BC Act, with reference to the assessment of development (Part 4 of the EP&A Act) or activities (Part 5 of the EP&A Act), is:

> *(k) to establish a framework to avoid, minimise and offset the impacts of proposed development and land use change on* biodiversity
>
> *(l) to establish a scientific method for assessing the likely impacts on biodiversity values of proposed development and land use change, for calculating measures to offset those impacts and for assessing improvements in biodiversity values*
>
> *(m) to establish market-based conservation mechanisms through which the biodiversity impacts of development and land use change can be offset at landscape and site scales.*

Part 7 of the Biodiversity Conservation Act 2016 requires that an application for development that is "likely to significantly affect threatened species" must be accompanied by a biodiversity development assessment report, except as provided by the Regulations.

5.2.5 Threatened Species Conservation Act 1995

The objectives of the (now repealed) Threatened Species Conservation Act 1995 (TSC Act) are contained under Clause 3:

> *The objects of this Act are as follows:*
> *(a) to conserve biological diversity and promote ecologically sustainable development, and*
> *(b) to prevent the extinction and promote the recovery of threatened species, populations and ecological communities, and*
> *(c) to protect the critical habitat of those threatened species, populations and ecological communities that are endangered, and*
> *(d) to eliminate or manage certain processes that threaten the survival or evolutionary development of threatened species, populations and ecological communities, and*
> *(e) to ensure that the impact of any action affecting threatened species, populations and ecological communities is properly assessed, and*
> *(f) to encourage the conservation of threatened species, populations and ecological communities by the adoption of measures involving co-operative management.*

The TSC Act contained provisions for the preparation of Species Impact Statements (SIS).

The now repealed cl.79B(3) of the EP&A Act provided that Development Consent cannot be granted for development that is likely (when assessed under the now repealed cl.5A of the EP&A Act) to significantly affect a threatened species, population, or ecological community, or its habitat, without the concurrence of the Chief Executive of the Office of Environment and Heritage.

Further, the now repealed cl.79B(5) provided that (underlined for emphasis):

In deciding whether or not concurrence should be granted under subsection (3), the Chief Executive of the Office of Environment must take the following matters into consideration:

> *(a) <u>any species impact statement that accompanied the development application,</u>*
> *(b) any assessment report prepared by the consent authority,*
> *(c) any submissions received concerning the development application,*
> *(d) any relevant recovery plan or threat abatement plan,*

(e) whether the development proposed is likely to reduce the long-term viability of the species, population or ecological community in the region,
(f) whether the development is likely to accelerate the extinction of the species, population or ecological community or place it at risk of extinction,
(g) the principles of ecologically sustainable development,
(h) the likely social and economic consequences of granting or of not granting concurrence.

A review of the proposed zoning commissioned by Port Stephens Council at the request of OEH in 2009 was completed by EcoBiological Pty Ltd (2009). Among other things, Ecobiological also identified areas within the KHURA where land uses within an urban zone could potentially result in a significant impact on the certain threatened species or their habitat.

To inform and respond to Ecobiological's recommendations, and to inform the Development Application process (as to whether a significant impact is likely), the Chief Executive Requirements (CERs) for the preparation of a Species Impact Statement (SIS) were obtained from the NSW Office of Environment and Heritage in 2017, and updated in 2018.

The Species Impact Statement (**Attachment G**) determined that subject to the Concept Proposal adopting particular measures (detailed in **Section 2.4, Section 3.1 and Section 3.2**), the proposal is not likely to significantly affect a threatened species, population, or ecological community, or its habitat. Referral and the concurrence of the OEH is therefore unnecessary.

5.2.6 Fisheries Management Act 1994

Part 7A of the Fisheries Management Act 1994 provides objectives specific to this Part:

220A Objects of Part
The objects of this Part are as follows—
(a) to conserve biological diversity of fish and marine vegetation and promote ecologically sustainable development and activities,
(b) to prevent the extinction and promote the recovery of threatened species, populations and ecological communities of fish and marine vegetation,
(c) to protect the critical habitat of those threatened species, populations and ecological communities that are endangered,
(d) to eliminate or manage certain processes that threaten the survival or evolutionary development of threatened species, populations and ecological communities of fish and marine vegetation,
(e) to ensure that the impact of any action affecting threatened species, populations and ecological communities of fish and marine vegetation is properly assessed,
(f) to encourage the conservation of threatened species, populations and ecological communities of fish and marine vegetation by the adoption of measures involving co-operative management.

The authors of the SIS, RPS Group prepared an assessment of the potential impacts of the development on key fish habitat. The results of this assessment are discussed in **Section 4.6.8** and the report provided as **Attachment I**.

5.3 Matters for Development Assessment under the EP&A Act

Clause 4.15 of the EP&A Act provides a list of matters that are to be considered and assessed to the extent relevant to the development the subject of the development application.

> ***4.15 Evaluation***
>
> *(1)* ***Matters for consideration—general*** *In determining a development application, a consent authority is to take into consideration such of the following matters as are of relevance to the development the subject of the development application—*
>
> *(a) the provisions of—*
>
> *(i) any environmental planning instrument, and*
>
> *(ii) any proposed instrument that is or has been the subject of public consultation under this Act and that has been notified to the consent authority (unless the Planning Secretary has notified the consent authority that the making of the proposed instrument has been deferred indefinitely or has not been approved), and*
>
> *(iii) any development control plan, and*
>
> *(iiia) any planning agreement that has been entered into under section 7.4, or any draft planning agreement that a developer has offered to enter into under section 7.4, and*
>
> *(iv) the regulations (to the extent that they prescribe matters for the purposes of this paragraph),*
>
> *(v) (Repealed)*
>
> *that apply to the land to which the development application relates,*
>
> *(b) the likely impacts of that development, including environmental impacts on both the natural and built environments, and social and economic impacts in the locality,*
>
> *(c) the suitability of the site for the development,*
>
> *(d) any submissions made in accordance with this Act or the regulations,*
>
> *(e) the public interest*.

5.3.1 Relevant Environmental Planning Instruments

Environmental planning instruments include State Environmental Planning Policies (SEPPs) as are applicable to the Port Stephens Local Government Area and the Concept Proposal (including Stage 1 Subdivision Works), and the Port Stephens Local Environmental Plan 2013.

5.3.1.1 SEPP 44 - Koala Habitat Protection

Port Stephens Comprehensive Koala Plan of Management (CKPoM) 2002 supersedes SEPP 44. Section 5.1.4 of the SIS notes that the Port Stephens CKPoM provides performance criteria for development applications under Section 5.3, as listed below:

a. *Minimise the removal or degradation of native vegetation within Preferred Koala Habitat or Habitat Buffers;*

b. *Maximise retention and minimise degradation of native vegetation within Supplementary Koala Habitat and Habitat Linking Areas;*

c. *Minimise the removal of any individuals of preferred koala food trees, where ever they occur on a development site. In the Port Stephens LGA these tree species are Swamp Mahogany (Eucalyptus robusta), Parramatta Red Gum (Eucalyptus parramattensis) and Forest Red Gum (Eucalyptus tereticornis). An additional list of tree species that may be important to koalas based on anecdotal evidence is included in Appendix 8 of the Port Stephens Council CKPoM (as recommended by the CKPoM Consultative Committee);*

d. *Make provision, where appropriate, for restoration or rehabilitation of areas identified as Koala Habitat including Habitat Buffers and Habitat Linking Areas over Mainly Cleared Land. In instances where Council approves the removal of koala habitat (in accordance with dot points 1-4 of the above waive clause), and where circumstances permit, this is to include measures which result in a "net gain" of koala habitat on the site and/or adjacent land;*

e. *Make provision for long term management and protection of koala habitat including both existing and restored habitat;*

f. *Not compromise the potential for safe movement of koalas across the site. This should include maximising tree retention generally and minimising the likelihood that the proposal would result in the creation of barriers to koala movement, such as would be imposed by certain types of fencing;*

g. *Be restricted to identified envelopes which contain all buildings and infrastructure and fire fuel reduction zone; and*

h. *Include measures to effectively minimise the threat posed to koalas by dogs, motor vehicles and swimming pools by adopting minimum standards for these threats.*

Information that is to accompany applications on sites that contain preferred or supplementary habitat, habitat buffers or habitat linking areas is provided in Table 5.4 of the SIS, together with a section reference as to where the matter has been addressed in detail. This was guided by information obtained from the application of the "Guidelines for Koala Habitat Assessment" (Section 5.5 of the CKPoM) as outlined in Table 5.5 of the SIS.

An evaluation of the Proposal against the performance criteria is provided in Tables 5.4, 5.5 and 5.6 of the SIS

Surveys completed had reference to the "Guidelines for Koala Habitat Assessment" (Section 5.5 of the CKPoM) and were performed by a number of skilled experts, as listed below (with their roles):

- Dr Steven Phillips [SAT survey and Koala habitat utilisation assessment (BioLink 2019a), offset advice/ habitat area calculation (BioLink 2019b) and mitigation advice (BioLink 2019c) see SIS Appendix G];
- Mr Mark Aitkens [vegetation and tree mapping; GIS analysis (SIS)];
- Ms Olivia Woosnam [detection dogs (OWAD 2019a,b) see SIS Appendix H];
- Dr Fiona Hogan [Koala genetics analysis in OWAD (2019a,b) see SIS Appendix H];
- Dr Kara Youngentob [nutrient foliage analysis (Marsh and Youngentob 2019) see SIS Appendix I];
- Ms Karen Marsh [nutrient foliage analysis (Marsh and Youngentob 2019) see SIS Appendix I]; and
- Dr Robert Clark (statistical analysis: survey design for the nutrient foliage analysis).

5.3.1.2 SEPP 55 - Remediation of Land

The SEPP provides state-wide planning controls for the remediation of contaminated land, and in particular, aims to promote the remediation of contaminated land for the purpose of reducing the risk of harm to human health or any other aspect of the environment by specifying:

(a) when consent is required, and when it is not required, for a remediation work, and

(b) certain considerations that are relevant in rezoning land and in determining development applications

A site inspection and a preliminary investigation of the site have been carried out by the Geotechnical consultants (see **Section 4.5**). The assessment observes that the site poses no apparent risk of harm to human health or the environment, and that a more detailed assessment is not warranted.

5.3.1.3 SEPP (Infrastructure) 2007

Traffic Generating Development

Under Clause 104 Traffic-generating development, referral to the Roads and Maritime Services is required under *Schedule 3 Traffic generating development to be referred to the RTA* for reason that the site has *access to classified road or to road that connects to classified road (if access within 90m of connection, measured along alignment of connecting road)* and involves 50 or more lots.

Clause 104 provides that before determining a development application for development of the kind for which RMS must be consulted, the consent authority must—

(b) take into consideration—

(i) any submission that RMS provides in response to that notice within 21 days after the notice was given (unless, before the 21 days have passed, RMS advises that it will not be making a submission), and

(ii) the accessibility of the site concerned, including—

(A) the efficiency of movement of people and freight to and from the site and the extent of multi-purpose trips, and

(B) the potential to minimise the need for travel by car and to maximise movement of freight in containers or bulk freight by rail, and

(iii) any potential traffic safety, road congestion or parking implications of the development.

Consideration of subclause (3)(b)(ii) is as follows:

(A) the efficiency of movement of people and freight to and from the site and the extent of multi-purpose trips

The collector road is proposed to connect the site to the Pacific Hwy via an interchange, ensuring safe and efficient movement of people and freight to and from the site. A traffic assessment by GHD commissioned by Port Stephens Council in 2019 considers the safety and efficiency thresholds of the surrounding for road network, with and without the development (see **Section 4.9**) and provides recommendations.

(B) the potential to minimise the need for travel by car and to maximise movement of freight in containers or bulk freight by rail

The Concept Proposal identifies shared pedestrian and cycle paths linking between attractors within the site and future public transport routes, such as the school sitees, open space areas and the new town. The relatively flat grades and short distances between attractors will encourage minimal travel by car for local journeys, including school trips etc.

(iii) any potential traffic safety, road congestion or parking implications of the development -

The traffic assessment by GHD commissioned by Port Stephens Council in 2019 considers the safety and efficiency thresholds of the surrounding for road network, with and without the development (see **Section 4.9**) and provides recommendations.

Acoustic Impact

Clause 102(3) of the SEPP (Infrastructure) 2007 addresses the impact of road noise or vibration on non-road development by specifying the following criteria:

If the development is for the purposes of a building for residential use, the consent authority must not grant consent to the development unless it is satisfied that appropriate measures will be taken to ensure that the following LAeq levels are not exceeded:

(a) in any bedroom in the building - 35 dB(A) at any time between 10 pm and 7 am,

(b) anywhere else in the building (other than a garage, kitchen, bathroom or hallway) -40 dB(A) at any time.

Details of the Acoustic assessment prepared to respond to the SEPP criteria are provided in **Section 4.10**. Subject to the measures recommended, development consistent with the Concept Proposal is eligible for consent.

Utilities:

The SEPP provides an approvals pathway for infrastructure that is required to support the development of the land; for example:

- Water reticulation systems
- Sewage reticulation systems
- Electricity distribution
- Stormwater management systems

5.3.1.4 SEPP (State & Regional Development) 2011

The SEPP confers the functions of a Consent Authority to the relevant joint regional planning panel (JRPP) to determine development applications for regionally significant development.

This SEPP provides that the consent authority for this application will be the Newcastle and Hunter Region Joint Regional Planning Panel.

5.3.1.5 SEPP (Educational Establishments & Child Care Facilities) 2017

The aim of this Policy is to facilitate the effective delivery of educational establishments and early education and care facilities across the State.

The development proposes 2 potential sites suitable for development as an educational establishment.

The criteria within the SEPP relate largely to design details of a proposed school. Details of the school design are premature and not available for assessment.

5.3.1.6 SEPP (Vegetation in Non-Rural Areas) 2017

The aims of this Policy are:

> (a) to protect the biodiversity values of trees and other vegetation in non-rural areas of the State, and
>
> (b) to preserve the amenity of non-rural areas of the State through the preservation of trees and other vegetation.

This instrument applies in the Port Stephens LGA; within the R1 General Residential, B2 Local Centre and B4 Mixed Use Zones.

Clause 7(2) specifies that a person must not clear native vegetation in any non-rural area of the State that exceeds the biodiversity offsets scheme threshold without the authority conferred by an approval of the Native Vegetation Panel under Part 4:

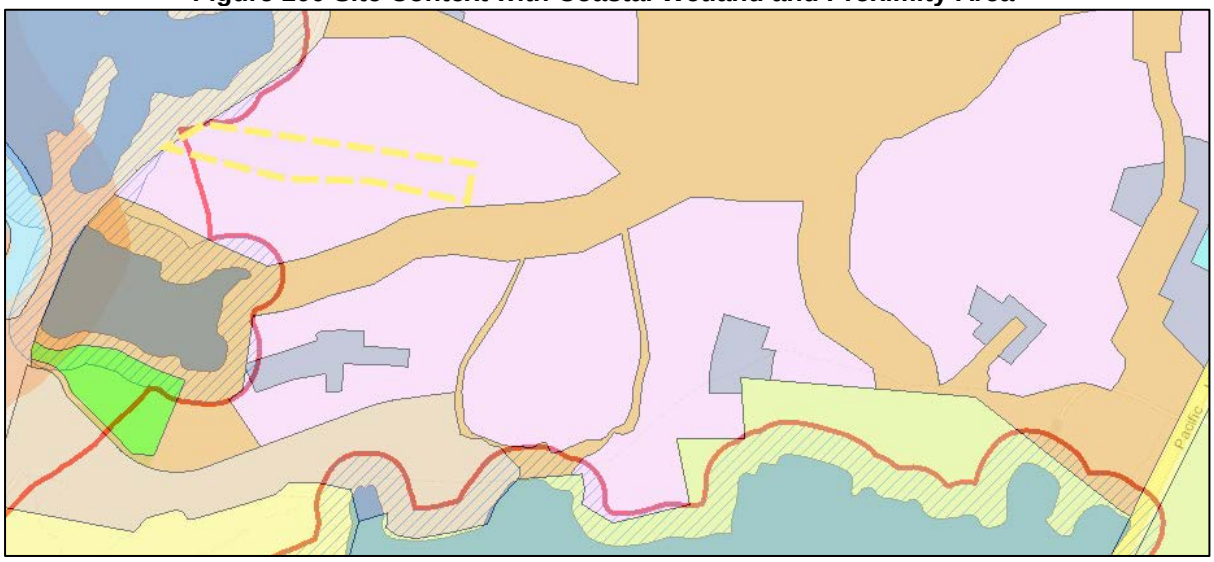
An authority is not required where Development Consent has been granted for clearing of native vegetation.

5.3.1.7 SEPP (Coastal Management) 2018

The aim of this Policy is to promote an integrated and co-ordinated approach to land use planning in the coastal zone in a manner consistent with the objects of the Coastal Management Act 2016, including the management objectives for each coastal management area.

The site and the Concept Proposal is mapped relative to the Coastal Wetlands and the associated proximity area in **Figure 100**.

Figure 100 Site Context with Coastal Wetland and Proximity Area



Source: DPIE Planning Portal

Minor areas of the site are mapped within the *proximity area* for Coastal Wetlands. The provisions of Clause 11(1) therefore apply:

> ***11 Development on land in proximity to coastal wetlands or littoral rainforest***
>
> *Note. The Coastal Wetlands and Littoral Rainforests Area Map identifies certain land that is inside the coastal wetlands area as "proximity area for coastal wetlands"*
>
> *(1) Development consent must not be granted to development on land identified as "proximity area for coastal wetlands" … unless the consent authority is satisfied that the proposed development will not significantly impact on—*
>
> > *(a) the biophysical, hydrological or ecological integrity of the adjacent coastal wetland or littoral rainforest, or*
> >
> > *(b) the quantity and quality of surface and ground water flows to and from the adjacent coastal wetland or littoral rainforest.*

Extensive Wetland assessment has been completed by Alluvium (Appendix E of Northrop Engineering **Attachment E**) to inform the Biodiversity, Key Fish Habitat, and stormwater management aspects of the Concept Proposal (see **Sections 3.1 and 3.2, 4.6.8 and 4.8**). Each assessment confirms that subject to the recommendations within the reports, Concept Proposal will not significantly impact on the Wetland environments.

5.3.1.8 Port Stephens Local Environmental Plan 2013

Clause 2.1 Land Use Zones

The following land use zones are present on the development site as illustrated in **Figure 101** below:

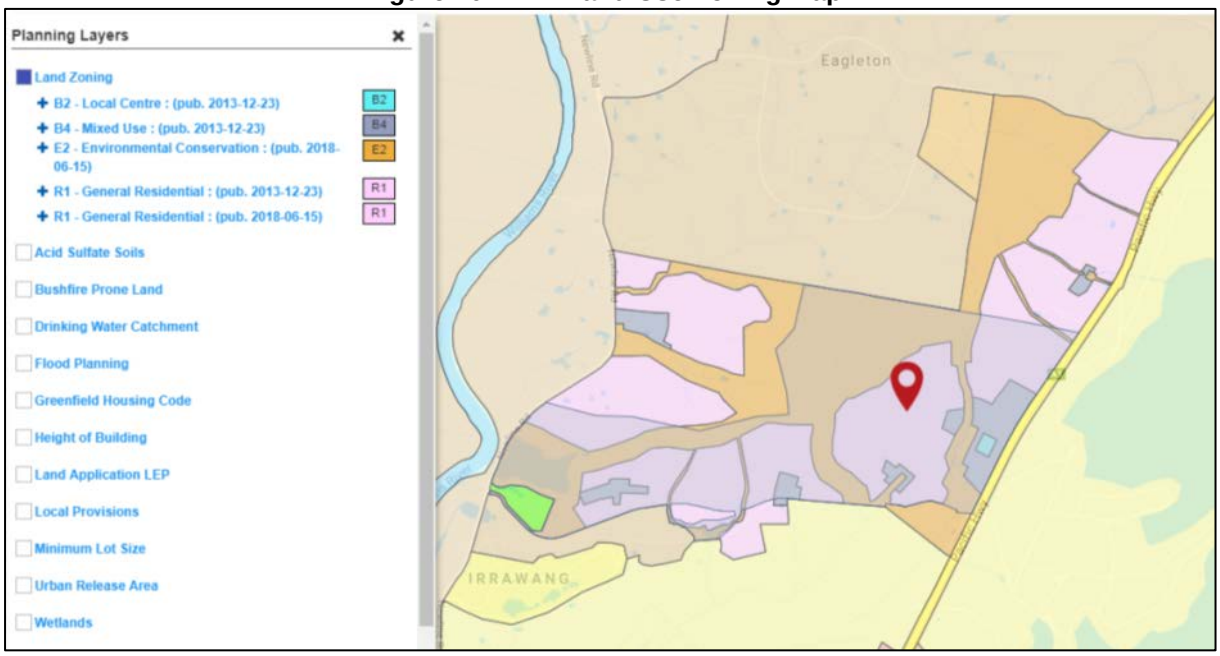
B2 Local Centre

B4 Mixed Use

E2 Environmental Conservation

R1 General Residential

Figure 101 LEP Land Use Zoning Map



Source: NSW Planning Portal

Clause 2.3 Zone Objectives and Land Use Table

The Concept Proposal enables future applications to carryout residential subdivision, as permitted with development consent in the R1 General Residential zoned land, and to protect, manage and restore the E2 environmental Conservation zoned land and those parts of the R1 zones where the SIS recommends avoiding development.

The Concept Proposal is therefore consistent with the objectives of the land use zones noted hereunder:

R1 General Residential Zone

- *To provide for the housing needs of the community.*
- *To provide for a variety of housing types and densities.*
- *To enable other land uses that provide facilities or services to meet the day to day needs of residents.*

The Concept Proposal meets these objectives by facilitating approval for residential subdivision development with a lot yield target of 1,900 lots of various lot sizes and densities.

B2 Local Centre Zone

- *To provide a range of retail, business, entertainment and community uses that serve the needs of people who live in, work in and visit the local area.*
- *To encourage employment opportunities in accessible locations.*
- *To maximise public transport patronage and encourage walking and cycling.*

B4 Mixed Use Zone

- *To provide a mixture of compatible land uses.*
- *To integrate suitable business, office, residential, retail and other development in accessible locations so as to maximise public transport patronage and encourage walking and cycling.*

The Concept Proposal provides a catalyst for land use within the B2 zoned land and the surrounding B4 zone, and will encourage patronage via collector roads and pedestrian and cycle linkages.

E2 Environmental Conservation Zone

- *To protect, manage and restore areas of high ecological, scientific, cultural or aesthetic values.*
- *To prevent development that could destroy, damage or otherwise have an adverse effect on those values.*

The Concept Proposal proposes limited infrastructure works in the E2 zone, including road linkages, stormwater management, and infrastructure works (linkages, water reservoirs etc.). These works will occur in areas of E2 zoned land that are subject to management under a Biodiversity Management Plan which is designed to restore the environment and establish a long term sustainable Conservation Area, consistent with the objectives of the E2 Zone.

Clause 2.6 Subdivision – Consent Requirements

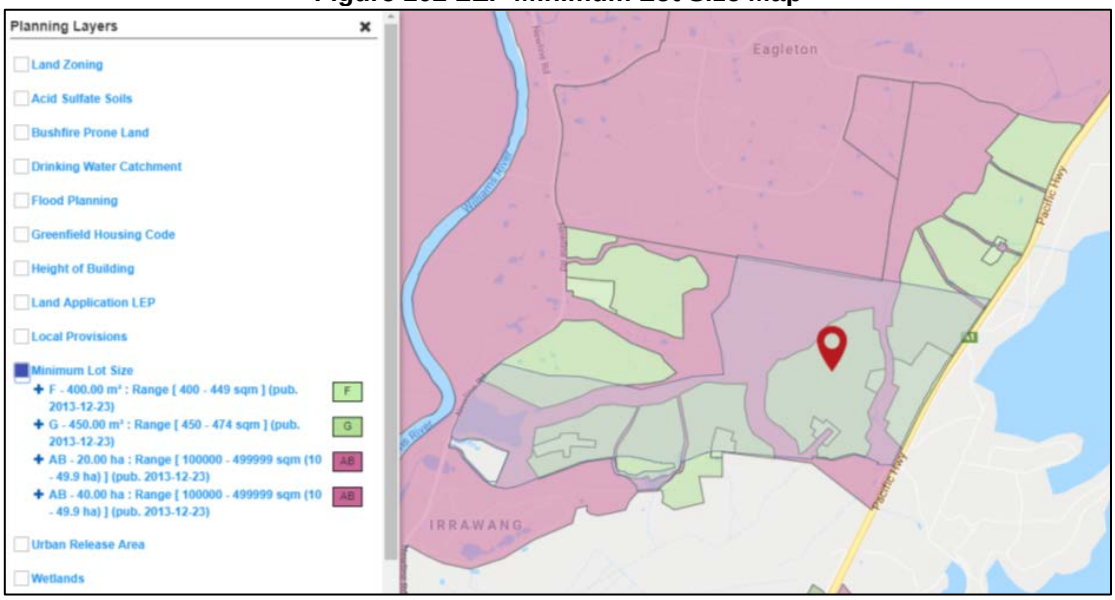
This clause provides that land to which the instrument applies may be subdivided with consent. The Concept Proposal will provide a framework for design and assessment of future applications under this clause to subdivide the land.

Clause 4.1 Minimum Subdivision Lot Size

The Concept Proposal is designed to enable future residential subdivision that comply with the minimum lot sizes permitted by the PSC LEP 2013 (see **Figure 102**), which are:

400m^2	20ha
450m^2	40ha

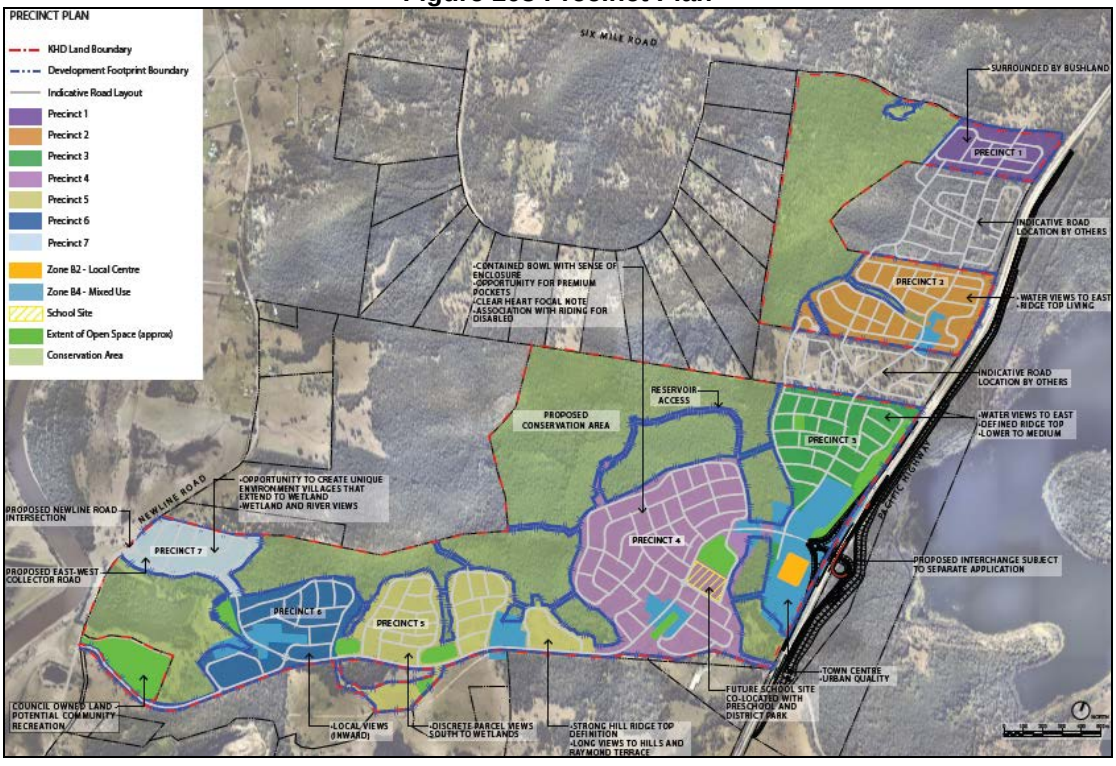
Figure 102 LEP Minimum Lot Size Map



Source: NSW Planning Portal

While the Concept Proposal does not identify individual lots and lot sizes, the Precinct Plan at in **Figure 103** below provides a potential lot yield based on lot sizes above the minimum lot size.

Figure 103 Precinct Plan



Source: PDS

Clause 5.10 Heritage Conservation

This clause provides that development consent is required for actions that will or are likely to affect items or places of heritage significance listed within Schedule 5 of the LEP. There are no items or places listed on the site.

Clause 6.1 Arrangements for Designated State Public Infrastructure
This clause provides that arrangements for designated State Public Infrastructure must be made prior to granting Development Consent for subdivision. The State VPA executed between KHD and the NSW Government (October 2019) enables a Satisfactory Arrangements Certificate (SAC) to accompany a DA for subdivision when such an application is made.

Clause 6.2 Public Utility Infrastructure
This clause provides that Council must be satisfied that provision is available for essential public utility infrastructure in an Urban Release Area, prior to development being carried out on the land. To this end, **Section 2.3.14** details the provisions available to enable development in accordance with the Concept Proposal.

Clause 6.3 Development Control Plan
This clause requires a Development Control Plan to be in effect prior to granting consent to development of the land. To this end, the Port Stephens Development Control Plan 2014 contains provisions specific to Kings Hill URA.

Clause 6.5 Infrastructure – Pacific Highway Access
This clause seeks to ensure that access to the Pacific Highway is provided in a manner that does not impede the safe and efficient operation of the Pacific Highway as part of the national highway network.

The clause provides that consent must not be granted for subdivision unless arrangements have been made, to the satisfaction of Roads and Maritime Services and the consent authority, for the provision of vehicular access from the urban release area to the Pacific Highway, including the closure or modification of any existing vehicular access from any land adjoining the Pacific Highway, if necessary.

The State VPA executed between KHD and the NSW Government (October 2019) enables a Satisfactory Arrangements Certificate (SAC) to accompany a DA for subdivision when such an application is made.

Clause 6.6 Access from Precinct Areas to Pacific Highway, Kings Hill
This clause provides that consent must not be granted to development on land within the Kings Hill URA unless the consent authority is satisfied that arrangements have been made to ensure flood free vehicular access from the Kings Hill Precinct areas to the Pacific Highway.

Post the delivery of the interchange, flood free access to the Pacific Highway is proposed via the East West collector road from the Pacific Highway to Newline Road. Prior to the interchange delivery, flood free access to the Pacific Highway will be northbound along Newline Road, then east to the Pacific Highway via Six Mile Road.

Northrop Engineers advise (see **Attachment E**) that minor upgrades to Newline Road are required to enable flood free access prior to interchange delivery:

> *Preliminary investigation undertaken by Northrop has identified that Newline Road would need to be raised to approximately RL4.2m AHD to provide immunity to the 1% AEP, for a length of approximately 785m.*

Clause 7.1 Acid Sulfate Soils
This clause provides that development consent is required for certain *works* within certain land identified on the Acid Sulfate Soils (ASS) Map. The majority of the land is identified as Class 5 soil, while Wetland 803 is recognised as Class 2 soil (see **Section 4.3** and **Figure 80**).

For this area, works are defined as:

> *Works within 500 metres of adjacent Class 1, 2, 3 or 4 land that is below 5 metres Australian Height Datum and by which the water table is likely to be lowered below 1 metre Australian Height Datum on adjacent Class 1, 2, 3 or 4 land*.

Works which fall within this definition require preparation of an Acid Sulfate Soils Management Plan (ASSMP) specific to the extent and design of those works, and prior to carryout of those works.

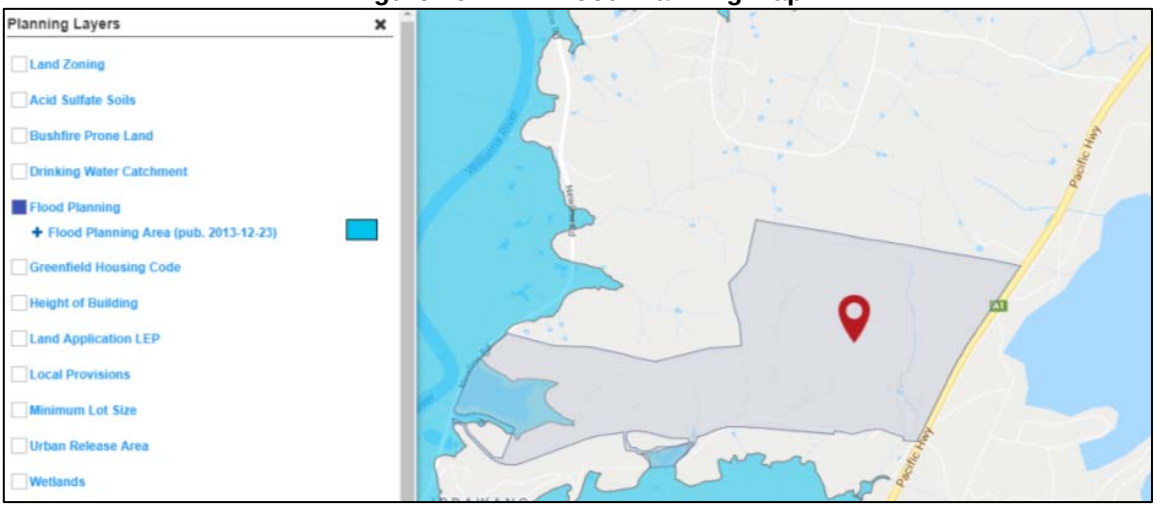
Clause 7.2 Earthworks
This clause provides that development requiring earthworks must be assessed against select criteria to ensure minimal environmental impacts will be produced during and as a result of development.

Earthworks are not proposed within Stage 1 of the Concept Proposal. Subsequent DAs involving subdivision construction works will be required to address this provision relative to specific engineering design.

Clause 7.3 Flood Planning
This clause provides that development within an identified flood prone area or lands below the flood planning level is assessed to determine the flood hazard risk and the likely impacts of flooding on the development.

The PSLEP 2013 maps a portion of the South Western corner development area as the Flood Planning Area (see **Figure 104**).

Figure 104 LEP Flood Planning Map



Source: NSW Planning Portal

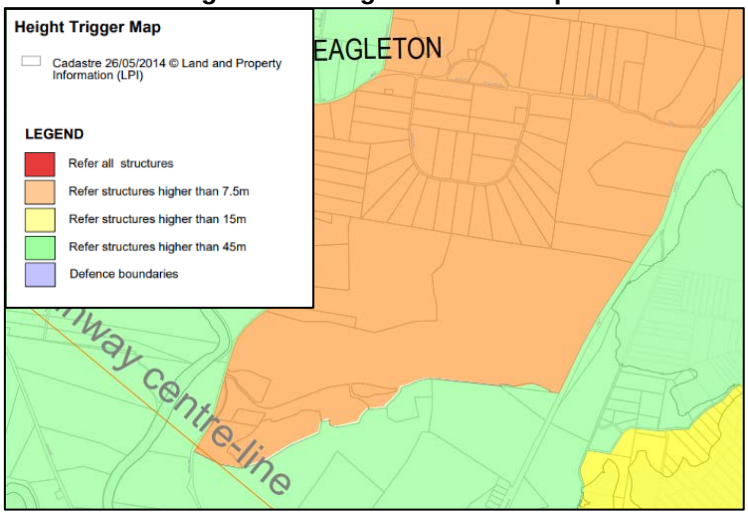
WBM BMT were commissioned by Council in 2013 to assess flood risk associated with the KHURA, and Northrop Engineers have adopted that advice (see **Section 2.3.5**) to confirm the Concept Proposal is compatible with the local Flood Risk.

Clause 7.4 Airspace Operations

This clause provides that development within the Airspace Operations Area of Williamtown Defence Base does not penetrate the Limitation or Operations Surface as identified in Council Mapping.

Figure 105 extracted from Councils DCP illustrates the extent of development where structure greater than 7.5m in height will be referred to the relevant Commonwealth body. The Concept Proposal does not trigger this provision.

Figure 105 Height Referral Map

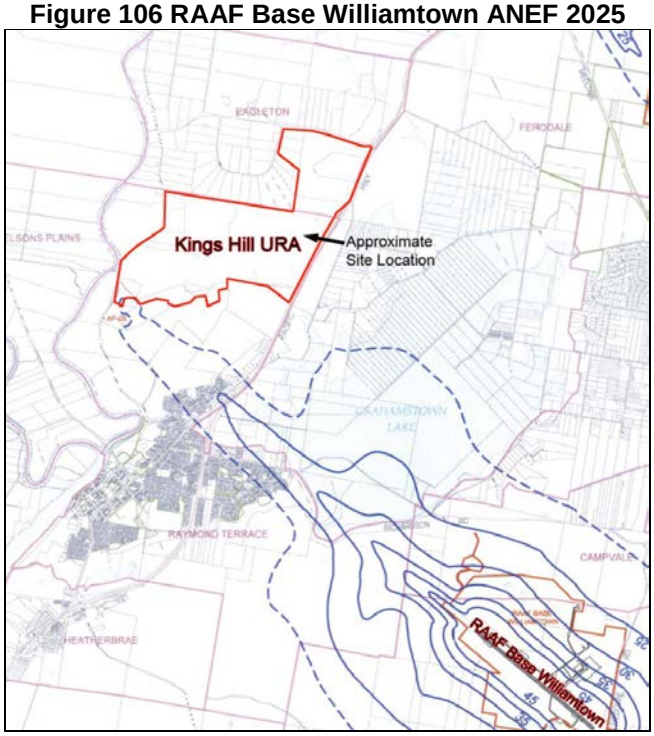


Source: Port Stephens DCP2014

Clause 7.5 Development in areas subject to aircraft noise

Figure 106 below indicates that the URA including the site is not mapped as aircraft noise affected. This clause does not apply.

Figure 106 RAAF Base Williamtown ANEF 2025



Source: Port Stephens Council

Clause 7.6 Essential Services
This clause duplicates the requirements of **Clause 6.2**, other than in respect of ensuring satisfactory provision of stormwater drainage (see **Section 3.3.5.3**) and suitable vehicular access (see **Section 3.3.5.5**).

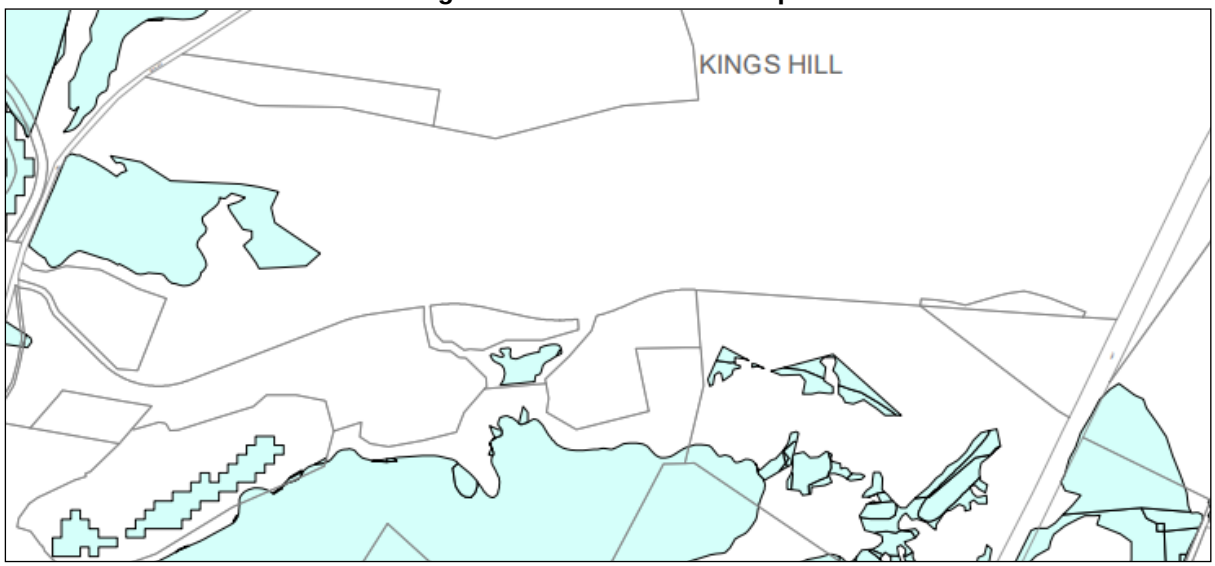
Clause 7.8 Drinking Water Catchments
This clause provides that development proposed within the Drinking Water Catchment of Grahamstown Dam is required to consider the potential impacts of the development on the quality and quantity of the water entering the drinking water storage areas.

Northrop Engineers (**Attachment E**) determined that the development will not provide any additional impacts on the drinking water collection areas with the adoption of the measures presented in **Section 4.8**.

Clause 7.9 Wetlands
In addition to the provisions of SEPP Coastal Wetlands, this clause requires that development on land mapped as Wetland by PSC LEP 2013 must consider the potential impacts of the development on the wetland habitat and water quality, and assess the mitigation measures proposed to minimise these impacts.

The area of land subject to this clause is illustrated in **Figure 107** below.

Figure 107 LEP Wetlands Map



Source: PSC LEP 2013

The Concept Proposal involves land within the mapped wetlands, namely within and around Wetland 803, and to centrally within the site south.

Subclause 7.9(3) and 7.3(4) provide as follows:

> *(3) Before determining a development application for development on land to which this clause applies, the consent authority must consider—*
> *(a) whether or not the development is likely to have any significant adverse impact on the following—*
> *(i) the condition and significance of the existing native fauna and flora on the land,*
> *(ii) the provision and quality of habitats on the land for indigenous and migratory species,*
> *(iii) the surface and groundwater characteristics of the land, including water quality, natural water flows and salinity, and*
> *(b) any appropriate measures proposed to avoid, minimise or mitigate the impacts of the development.*
>
> *(4) Development consent must not be granted to development on land to which this clause applies unless the consent authority is satisfied that—*
> *(a) the development is designed, sited and will be managed to avoid any significant adverse environmental impact, or*
> *(b) if that impact cannot be reasonably avoided—the development is designed, sited and will be managed to minimise that impact, or*
> *(c) if that impact cannot be minimised—the development will be managed to mitigate that impact.*

The matters to be considered have been investigated by Northrop Engineers, Alluvium, and RPS Group (**Attachments E and H**) in response to concerns raised by Hunter Water and Port Stephens Council as to the potential for development impacts on Wetland 803 and Irrawang Swamp.

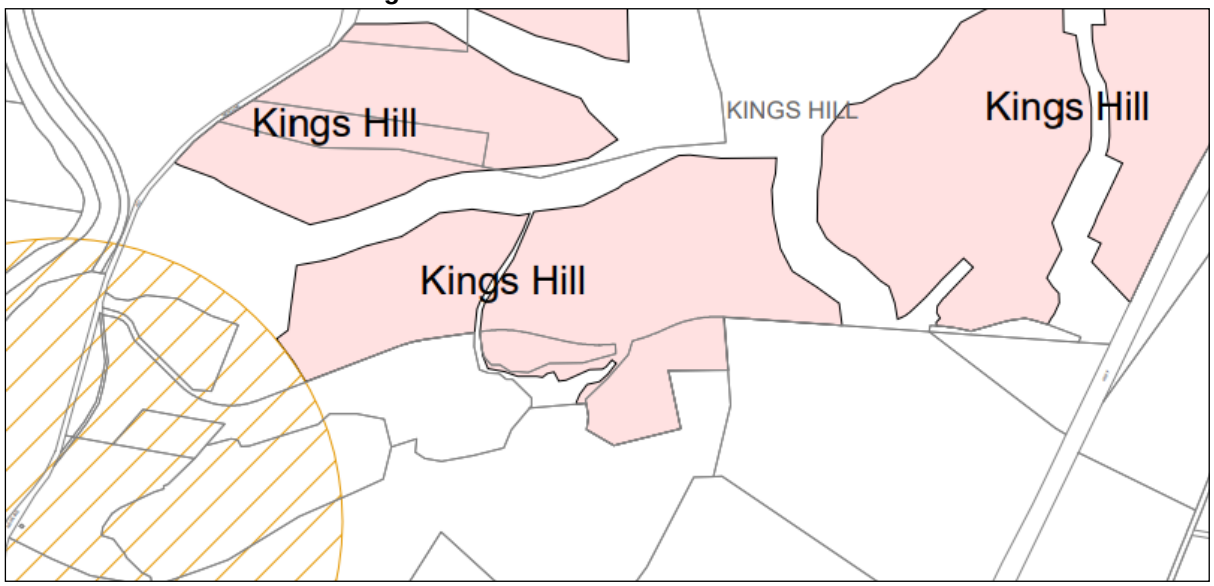
The outcomes of the assessments and the recommended measures are summarised in the following Sections to this application:

- **Section 2.3.6 - Coastal Wetlands**
- **Section 3.1 to 3.2 - Biodiversity**
- **Section 4.6.8 - Key Fish Habitat**
- **Section 4.8 - Stormwater Management**

Clause 7.11 Public Infrastructure Buffer
This clause provides avenue for the consent authority to assess the potential impacts of authorised public infrastructure land uses (Waste or Resource Management Facility) on the proposed development.

A Public Infrastructure Buffer has been established to provide area for consideration under this clause and transverses part of the site depicted in **Figure 108**.

Figure 108 Public Infrastructure Buffer



Source: PSC LEP 2013

The requirement for a buffer to the Waste Resource Management Facility was identified during the rezoning process for the URA. Consequently there is no urban zoned land within the buffer which ensures the Concept Proposal responds to the potential for impacts such as odour and noise.

Section 2.3.11 provides additional details relating to the buffer and in particular, observes that gas monitoring of landfill cells is required to occur 12 months prior to subdivision outside of the LEP buffer, but within 250m of the boundaries of land containing landfill cells.

Applications to subdivide and development the land subsequent to the Concept Proposal will be accompanied by that monitoring data, along with the details of any requirements.

5.3.1.8 Draft Environmental Planning Instruments

Draft LEP Amendment 2012

Council and DPIE Reference:

PP_2012_PORTS_009_00

Details:

A series of amendments proposed to 2010 gazetted Kings Hill standalone LEP to enable, among other things:

- Continuity of urban zoned areas to avoid otherwise complex infrastructure approvals;
- Additional permitted infrastructure not enabled *at the time* by SEPP Infrastructure (2007);
- additional permitted land uses to enable identified land use opportunities;
- reduced lot sizes in certain circumstances (e.g. lots with rear lane access) ;
- to enable subdivision to create un-serviced super lots

Many of the proposed amendments were resolved with the introduction of the Standard Instrument LEP, which incorporated the standalone Kings Hill LEP 2010. The Planning Proposal has been stagnant since the gazettal of PSLEP2013.

The most recent correspondence from Planning NSW granted an extension of time for completion of this proposal until 1 February 2016, it is assumed that this Determination has lapsed and therefore the Planning Proposal is abandoned.

If approved, the Concept Proposal would form the basis of a further LEP amendment. This may be in the form:

- modifications to the B4, R1 and E2 zoning boundaries to bring in to line with the Conservation Area and adjusted urban area extents recommended by the Concept Proposal;
- additional permitted land uses to enable greater diversity in land use activities where compatible with the Concept Proposal;
- adjustments to facilitate modern housing forms (Manor Housing, Small Lot Housing etc.) in line with contemporary housing demand (e.g. to cater for seniors living close to conveniences etc.)

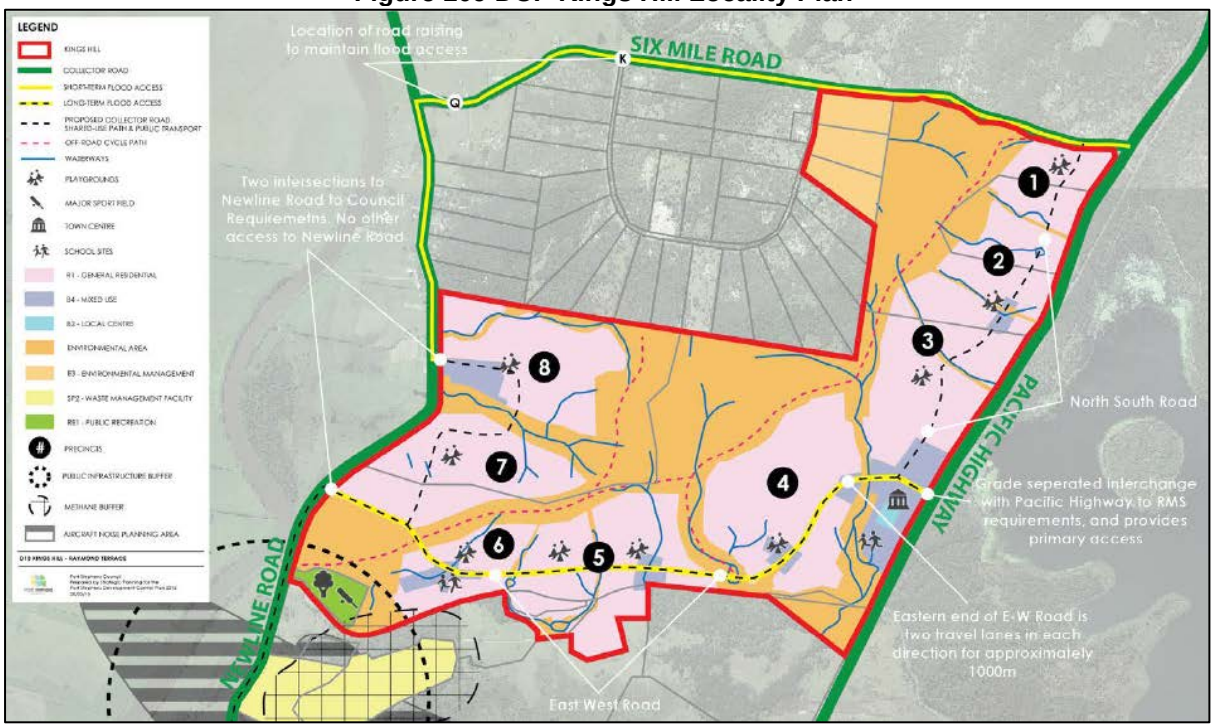
5.3.2 Port Stephens Development Control Plan 2014

The Concept Proposal is largely consistent with the plans and requirements of the Port Stephens Development Control Plan 2014 – particularly Section D – Specific Areas: Kings Hill.

Consistency with DCP Structure Plans

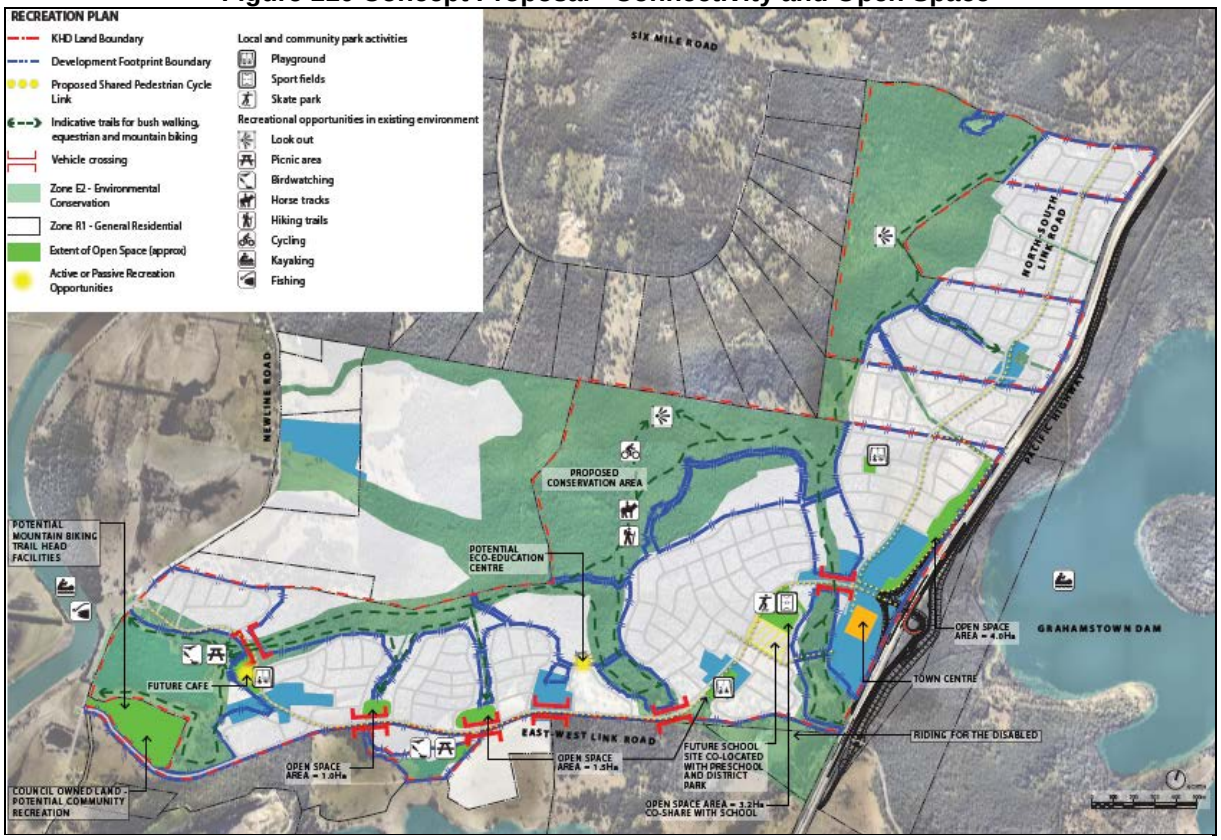
The Concept Proposal consists of subdivision precincts, a road network , and recreation opportunities consistent with the locality and precinct plans within the Port Stephens Council DCP (see **Figure 109, 110** and **Figure 111**, and **Figure 112**).

Figure 109 DCP Kings Hill Locality Plan



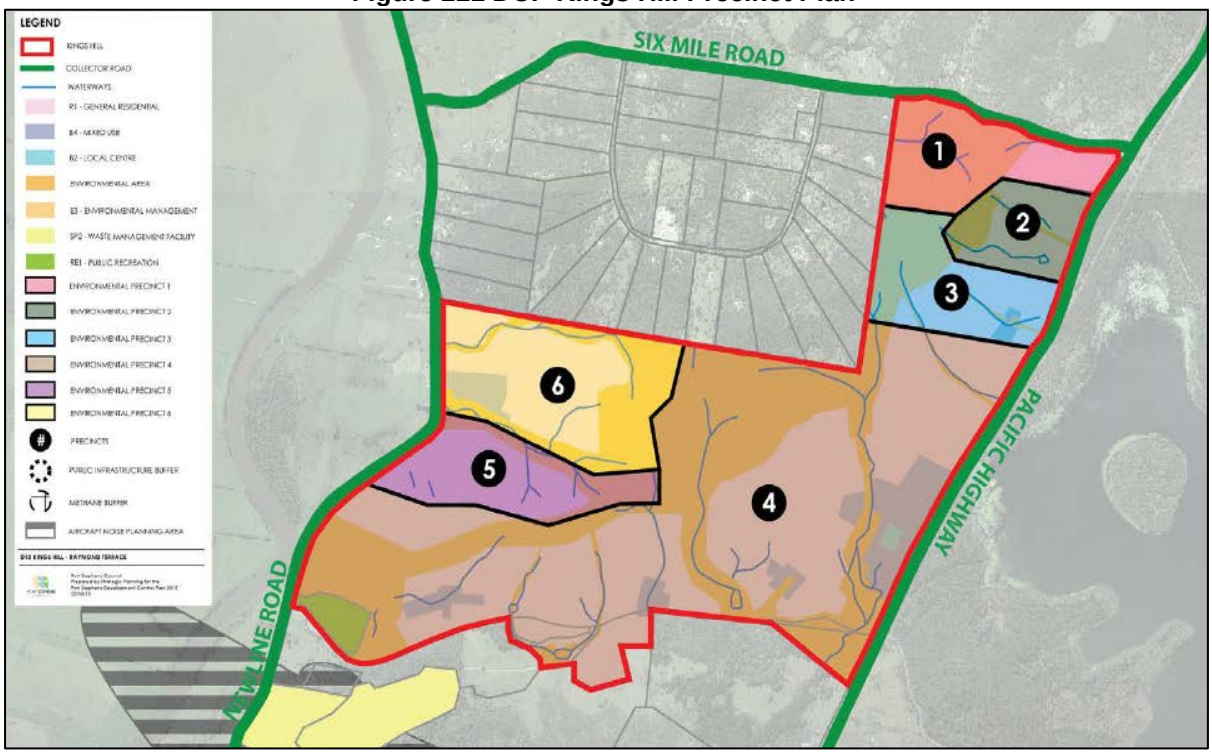
Source: Port Stephens DCP 2014

Figure 110 Concept Proposal - Connectivity and Open Space



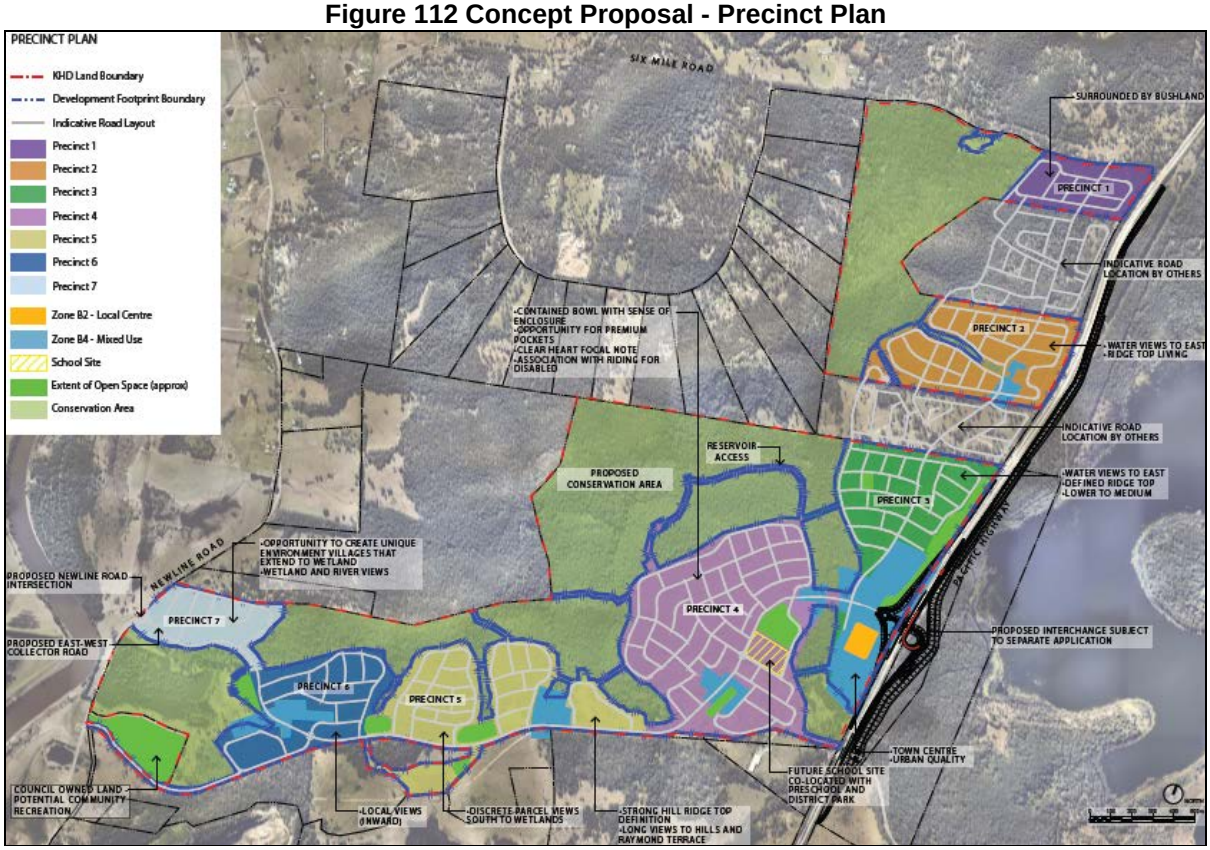
Source: PDS based on Northrop Engineers

Figure 111 DCP Kings Hill Precinct Plan



Source: Port Stephens DCP2014

Figure 112 Concept Proposal - Precinct Plan



Source: PDS based on Northrop Engineers

Consistency with DCP Development Assessment Criteria

Table 40 PSC DCP 2014 Assessment Criteria

Section	Standards	Compliance & Comments
B1 Tree Management		
B1.1	Council approval is required to remove or prune trees or other vegetation listed under Column 1, except where those circumstances listed under Column 2 are satisfied	Development Consent is sought by this application for the removal of trees within the site in the Impact Areas defined by the SIS. This provision is mapped in Figure BB of the DCP to apply to the proposed Conservation Area.
B2 Natural Resources		
B2.1	Development located on land or is within 500m of land that contains items of environmental significance … and has the potential to impact biodiversity is to provide: a Flora and Fauna Survey to inform the assessment of significance	A Species Impact Statement accompanies the DA**.**
B2.2	If biodiversity offsets are employed as a suitable compensatory measure under the TSC Act then they are: calculated in accordance with the bio-metric terrestrial biodiversity assessment tool consistent with the vegetation management technical specification in a secure tenure ownership located on land to which this Plan applies	Offsets are not proposed by the SIS. Instead, the Concept Proposal adopts an avoid, mitigate or minimise approach, including the establishment of a Conservation Area under a Conservation Agreement to ensure in perpetuity management and funding.
B2.3	Development will seek to prevent, eliminate or restrict the spread of noxious weeds in accordance with Noxious Weeds Technical Specification	A Biodiversity Management Plan and Vegetation Management Plan which provide a program for the management of noxious weeds.
B2.4	Development located on or in proximity to land identified as koala habitat complies with the Port Stephens Comprehensive Koala Plan of Management through consideration to the performance criteria.	CKPoM compliance is detailed in Section 5.1.4 of the SIS.

Section	Standards	Compliance & Comments
B3 Environmental Management		
B3.1	Development located on Acid Sulfate Soils (ASS) as identified on the Acid Sulfate Maps of the Local Environmental Plan adheres to the Local Environmental Plan requirements	Potential Acid Sulfate Soils occur in and around Wetland 803. Refer to **Section 4.3**.
B3.2	An air quality impact assessment is required where development has potential to adversely impact surrounding areas in terms of air quality.	The Concept Proposal adopts the LEP mapped buffer to the nearest operating Waste Facility. Development within 250m of the boundary of land containing past and present landfill cells will require assessment under a DA for development in those areas. Refer **Section 2.3.11**.
B3.3	An acoustic report is required for development that has the potential to produce offensive noise	The development is unlikely to produce offensive noise.
B3.4	Development may need to provide a bulk earthworks plan in order to adequately address the above matters	Earthworks do not form part of the works under this application. Each application subsequent to the approved Concept Proposal is to provide a bulk earthworks plan and a detailed Construction Management Plan.
B4 Drainage and Water Quality		
B4.1	Development that applies to this Part is to provide a stormwater drainage plan and a written description of the proposed drainage system within the SEE	Refer to stormwater management details in **Section 3.0 and Section 4.8**. Additional considerations for stormwater drainage are addressed in response to DCP section C1 below.
B4.2	On-site detention / on-site infiltration is required	Refer to stormwater management details in **Section 3.0 and Section 4.8**. Additional considerations for stormwater drainage are addressed in response to DCP section C1 below.
B4.5	Development is to provide water quality measures in accordance with Table BF: Water Quality Table	Refer to stormwater management details in **Section 3.0 and Section 4.8**. Additional considerations for stormwater drainage are addressed in response to DCP section C1 below.
B4.12	Development provides riparian corridors that are generally consistent with the recommendations of the NSW Office of Water. 2012, 'Guidelines for riparian corridors on waterfront land	Refer to riparian plan in **Section 4.8 Figures 89** and **90**.

Section	Standards	Compliance & Comments
B5 Flooding		
B5.1	Development provides consideration to flood hazard, which includes consideration of the following: Depth of inundation Flow velocity Warning time Evacuation requirements Access restrictions during flood	Refer to **Section 2.3.5** and stormwater management details in **Section 3.0 and Section 4.8**. Additional considerations for stormwater drainage are addressed in response to DCP section C1 below
B6 Essential Services		
B6.1	A development application must demonstrate that any of the following services that are essential for the development are available or that adequate arrangements have been made to make them available when required	Refer **Section 2.3.14**. Services and capacity available or arrangements made.
B7 Williamtown RAAF Base – Aircraft Noise and Safety		
B7.9	When development seeks to penetrate the RAAF Base Williamtown Obstacle Limitations or Operations Surface or Procedures for Air Navigation Systems Operations Surface as identified by Figure BO (p. B-46) the Department of Defence is notified and provided with an opportunity for comment.	The development does not propose any actions that will penetrate the OLS.
B8 Heritage		
B8.1	Development under PSLEP 2013 clause 5.10 that is likely to impact on the heritage significance of a heritage item provides a heritage impact statement with the development application that is consistent with the Office of Environment & Heritage, N/A, 'Statements of Heritage Impact'	The site does not comprise items or places of heritage significance listed under Schedule 5 of the LEP.

Section	Standards	Compliance & Comments
B9 Road Network and Parking		
B9.1	The SEE details: car parking location, number and dimensions; access arrangements; traffic implications on the existing road network and junctions; street features, such as trees, footpaths and pipes; and pedestrian impacts and access for disabled persons.	The Concept Development application provides subdivision information at a Precinct level, including primary land uses and major road connections. The plans provide an indicative layout for residential subdivision which facilitates compliance with Council requirements and technical specifications.
B9.2	A Traffic Impact Assessment (TIA) is required for: development for 20 or more dwellings; development defined as traffic generating development; or development deemed in Council's opinion to impact on the existing road network	Refer to **Section 4.9** with reference to Council commissioned TIA in April 2019.
B9.14	A development application for 20 or more dwellings shall demonstrate that bus stops and shelters are: Existing and fully accessible to current standards within a 400m walking catchment or bus stops within a 400m catchment are able to be upgraded (at the proponents cost). Located as close as possible to the common destination, being the development site, and are connected to the entry of the development by a continuous accessible footpath	As a Concept Development application, the location of public transport facilities is proposed to be detailed in subsequent development applications. Refer to **Section 3.3** for details as to how the Concept Proposal accommodates public transport use, cycling and pedestrian activity.
B10 Social Impact		
B10.1	A social impact assessment is required for development with the potential to have a significant social impact	A comprehensive Social Impact Assessment was furnished with the KHURA rezoning proposal and exhibited in 2007. **Section 4.11** provides Social Impact comments relevant to the Concept Proposal.

Section	Standards	Compliance & Comments
C1 Subdivision		
C1.1	Minimum Lot dimensions.	The Concept Development application provides subdivision information at a Precinct level, including primary land uses and major road connections. The plans provide an indicative layout for residential subdivision which facilitates compliance with Council requirements and technical specifications.
C1.2	Street layout complies with the road network specifications in infrastructure specification – design	The Concept Development application provides subdivision information at a Precinct level, including primary land uses and major road connections. The plans provide an indicative layout for residential subdivision which facilitates compliance with Council requirements and technical specifications. Proposed road hierarchy is provided in **Section 3.3.2** and **Figure 55**, while proposed road profiles are shown in **Section 3.3.5.3**.
C1.3	The street layout and specifications – relevantly: Road widths accommodate the necessary movements of service and emergency vehicles Footpaths and shared paths follow desire lines Street layout is interconnected to provide a grid-like structure Street layout is informed by street connections for future subdivisions on adjacent lands Street layout seeks to provide a perimeter road between residential dwellings and; bush fire prone land open space defined as a regional park, district park or local park Street layout ensures public access to public open space is maintained and encouraged Street layout responds to the topographical features of the site.	The Concept Development application provides subdivision information at a Precinct level, including primary land uses and major road connections. The plans provide an indicative layout for residential subdivision which facilitates compliance with Council requirements and technical specifications. Proposed road hierarchy is provided in **Section 3.3.2** and **Figure 55**, while proposed road profiles are shown in **Section 3.3.5.3**.

Section	Standards	Compliance & Comments
C1.4	Cul-de-sacs are generally only supported where: the existing street layout does not permit a through street connectivity to an adjoining street is not required the cul-de-sac has a maximum length of 75m access is provided to no more than 10 allotments clear line of sight is provided from the nearest intersection	The Concept Proposal does propose the use of cul-de-sac streets.
C1.5	Street trees are required as a component of the road reserve for the following: residential subdivisions commercial subdivisions Street trees are provided in accordance with the tree technical specification Attachment 1 – Tree Planting Guidelines of the tree technical specification provides guidance to the application of Attachment 2 to determine the total number of trees to be provided	The Concept Development application provides subdivision information at a Precinct level, including primary land uses and major road connections. The plans provide an indicative layout for residential subdivision which facilitates compliance with Council requirements and technical specifications.
C1.6	Subdivision adheres with Local Environmental Plan Part 4	The Concept Development application provides subdivision information at a Precinct level, including primary land uses and major road connections. The plans provide an indicative layout for residential subdivision which facilitates compliance with Council requirements and technical specifications.
C1.7	A residential lot is capable of supporting a rectangular building footprint of 15m x 8m or 10m x 12m	The Concept Development application provides subdivision information at a Precinct level, including primary land uses and major road connections. The plans provide an indicative layout for residential subdivision which facilitates compliance with Council requirements and technical specifications.
C1.8	All lots provide direct street frontage	The Concept Development application provides subdivision information at a Precinct level, including primary land uses and major road connections. The plans provide an indicative layout for residential subdivision which facilitates compliance with Council requirements and technical specifications.

Section	Standards	Compliance & Comments
C1.9	Splay corners are provided for corner lots and must be a minimum of: 4m x 4m for residential zones	The plans provide an indicative layout for residential subdivision which facilitates compliance with Council requirements and technical specifications.
C1.10	Residential subdivision addresses the following guidelines for solar access	The Concept Development provide an indicative layout for residential subdivision which facilitates compliance with solar access.
C1.11	Council may require the provision of public open space in accordance with the following.	Open Spaces areas are proposed as detailed in **Section 3.3** subject to Council's proposed s7.11 Contribution's Plan.
C1.12	The quantity of public open space may be reduced if: accessibility is improved through such measures as providing extended connections to the wider pedestrian network; value of open space is improved through such measures as an increased amount and/or quality of park furniture, amenities, play equipment, sports infrastructure	The proposed open space area meets Councils required standards.
C1.13	Public open space for the purpose of a local park, district park or regional park must: be of regular shape to maximise recreation opportunities; be generally flat and centrally located near transport nodes, to maximise accessibility for all members of the public; provide for safe and convenient access by being located on pedestrian and cycle routes; clearly demonstrate that it is a public space and be bounded by a street and faced by lots zoned or used for residential or commercial purposes; be designed with consideration to CPTED principles; and include access for services (e.g. garbage collection, maintenance, water, sewerage and electricity)	The Concept Proposal provides open space areas designed to be: • Of regular shape • On flat or low undulating ground • Accessible to pedestrians and cyclists • Bound by residential and/or commercial land It is proposed that detail such as open space designs and uses are included with the subsequent development applications for the individual Precincts, subject to Council's proposed s7.11 Contribution's Plan.

Section	Standards	Compliance & Comments
C1.16	Infrastructure in accordance with the infrastructure specification – design is identified on the Concept Utility Plans or more detailed Preliminary Engineering Plans	The Concept Proposal provides an indicative layout for residential subdivision which facilitates compliance with Council requirements and technical specifications
C1.17	Subdivision provides public infrastructure within the adjoining road or public land, including kerb/gutter, stormwater drainage, footpaths, street lighting, street trees and bus shelters	The Concept Proposal provides an indicative layout for residential subdivision which facilitates compliance with Council requirements and technical specifications
C1.19	Each lot must be able to be gravity drained through the drainage system to public drainage	The Concept Proposal provides an indicative layout for residential subdivision which facilitates compliance with Council requirements and technical specifications
C1.21	An overland flow path is provided for the 1% Annual Exceedance Probability (AEP) storm event and is a drainage reserve dedicated to Council as operational land	The Concept Proposal provides an indicative layout for residential subdivision which facilitates compliance with Council requirements and technical specifications
D14 Kings Hill – Raymond Terrace		
D14.1	A Precinct Plan is prepared to accompany the first stage of a development application in any of the development precincts identified on the Local Environmental Plan	The Concept Proposal provides an indicative layout for residential subdivision which facilitates compliance with Council requirements and technical specifications
D14.8	Consent for initial subdivision of land zoned B2 Local Centre or B4 Mixed Use requires preparation of a Town or Village Centre Precinct Plan for the entire zoned area	No further subdivision of town or village centres is proposed as part of this application.
D14.10	Subdivision layout enables neighbouring sites/precincts to deliver the outcomes sought by the Locality Controls Map	The Concept Proposal is generally consistent with the Locality Controls Map. Refer to **Section 5.4**.
D14.11	Consent for the subdivision of land other than for the creation of a super lot requires a servicing strategy	The Kings Hill Development Water Servicing Strategy Revision H and the Kings Hill Development Wastewater Servicing Strategy Revision G prepared by SMEC have been conditionally approved by Hunter Water Corporation. Ausgrid and NBNCo confirm capacity available for electrical and telecommunication services - refer to **Section 2.14**.

Section	Standards	Compliance & Comments
D14.12	All commercial and residential allotments are to be serviced by reticulated water, sewerage, electricity and telecommunication services	As above.
D14.13	Each Precinct Plan requires preparation of an overall transport movement hierarchy which: shows the major circulation routes and connections to achieve a simple and safe movement system for private vehicles, public transport, pedestrians and cyclists is generally consistent with the overall road network and the pedestrian and cycleway networks indicated on the Locality Controls Map indicates progressive provision of the east-west and north-south connector roads as well as direct connections to adjacent precincts	The Concept Development application provides subdivision information at a Precinct level, including primary land uses and major road connections. The plans provide an indicative layout for residential subdivision which facilitates compliance with Council requirements and technical specifications. Proposed road hierarchy is provided in **Section 3.3.2 and Figure 55**, while proposed road profiles are shown in **Section 3.3.5.3**.
D14.14	Positioning and design of the transport movement network provides priority to facilitating efficient walking, cycling and public transport networks and retaining and complementing natural topography, such as views and drainage	Refer to **Section 3.3** and **Figure 56**. The Concept Proposal complies these objectives.
D14.15	Development within each precinct provides internal collector roads generally consistent with the Locality Controls Map.	Refer to proposed road hierarchy is provided in **Section 3.3.2 and Figure 55**, while proposed road profiles are shown in **Section 3.3.5.3**. The Concept Proposal is generally consistent with the Locality Controls Map. Refer to **Section 5.4**.
D14.17	The eastern end of the east-west collector road, for a length of approximately one kilometre, is to have two travel lanes in each direction. This section of the east-west road is constructed generally in accordance the Illustration at Figure DZ.	The proposed road profiles for the collector road are shown in **Section 3.3.5.3**. Refer to Traffic Assessment in **Section 4.9.**

Section	Standards	Compliance & Comments
D14.22	Designated public transport routes as identified on the Locality Controls Map at Figure DAC are constructed as bus routes in accordance with infrastructure specification – design	Refer to proposed road hierarchy is provided in **Section 3.3.2** and **Figure 55**, while proposed road profiles are shown in **Section 3.3.5.3**. The Concept Proposal is generally consistent with the Locality Controls Map. Refer to **Section 5.4**.
D14.24	Pedestrian and cycle paths (including shared paths) are provided generally in accordance with the Locality Controls Map	Pedestrian and cycle paths are proposed generally in line with the Locality Controls Map.
D14.25	A pedestrian path is provided on one side and a shared path of all: collector roads roads that are within a B2 Local Centre Zone or B4 Mixed Use zone roads within 400m of and providing the primary frontage to a school or major community facility	A pedestrian path is proposed on one side and a shared path on the other of all collector roads, B2/B4 roads and within 400m of, and providing primary frontage to the school. Refer to proposed road profiles are shown in **Section 3.3.5.3**.
D14.27	Precinct Plans identify the location of required community and recreation facilities, generally in accordance with the Locality Controls Map	The Concept Proposal is consistent with the Locality Controls Map, and facilitates compliance with Council requirements.
D14.28	Community facilities such as the multi-purpose community centre are preferably located within the Town Centre as identified on the Locality Controls Map	The Concept Proposal does not provide details of the proposed town centre. Community Facilities are subject to resolution of a s7.11 Contributions Plan by Council.
D14.29	The preferred locations of schools are identified on the Locality Controls Map at Figure DAC. School sites will be subject to the site-selection criteria and agreement of the NSW Department of Education and Training and will be indicated on the relevant Precinct Plans.	The proposed location of the school sites was informed through consultation with the NSW Dept. of Education through the VPA process.
D14.30	All stormwater from development areas up to 0.2% AEP design flood event is prevented from discharging into Grahamstown Dam This may require construction of a watercourse along the eastern extent of developable areas of the Kings Hill urban release area to divert surface runoff away from Grahamstown Dam and into Irrawang Swamp	Refer to Stormwater Management details in **Section 4.8**

Section	Standards	Compliance & Comments
D14.31	Consent for development within the eastern and western catchments first requires lodgement of a stormwater drainage plan addressing drainage and water quality management for the entire catchment, to the satisfaction of the consent authority	Refer to Stormwater Management details in **Section 4.8**
D14.33	Applications for development on land zoned E2 Environmental Conservation or subject to terrestrial biodiversity controls in the Local Environmental Plan within each environmental precinct provide a VMP to the satisfaction of Council in accordance with the vegetation management technical specification. The VMP is provided with the precinct plan for the relevant environmental precinct boundaries identified by Figure DAC	Development is proposed on land zoned E2 in the form of URA enabling infrastructure (roads, pipelines etc.). A Biodiversity Management Plan and Vegetation Management Plan accompany this application.
D14.34	Measures, such as fencing and block configuration seek to restrict unauthorised access to E2 Environmental Conservation land to prevent rubbish dumping and damage by uncontrolled vehicle usage	It is proposed to fence the Conservation Area in the manner detailed in **Section 3.2.1.5**.
D14.35	Development involving a controlled activity within waterfront land is to comply with the requirements of the Water Management Act 2000	The riparian extents for existing streams have been determined in accordance with DI Water's Guidelines for riparian corridors on waterfront land. Refer to **Section 4.8**.
D14.36	All development within 250m of the Newline Road Waste Disposal Facility or any land in proximity as identified by Council has the potential to have methane concentrations of greater than 1.25% (v/v) in the subsurface and is to be tested with a tested/calibrated methane detector over regular intervals12 months prior to a ***subdivision*** application being lodged with Council for determination	Noted and acknowledged in **Section 2.3.11**.

Section	Standards	Compliance & Comments
D14.38	Consent for development in precincts 1 to 4 requires an acoustic report consistent with B3.3 and the following: Development meets the requirements of AS 3671-1989 Acoustics – Road Traffic Noise Intrusion – Building, Siting and Construction Acoustic/Vibration measures undertaken to comply with the conditions of development consent for a subdivision may remove the need for additional acoustic/vibration assessments and attenuation measures for subsequent developments	A preliminary Acoustic assessment has been undertaken by EMM – refer to details and recommendations in **Section 4.10**.
D14.39	Development at Kings Hill is visually buffered from the Pacific Highway by a minimum of 10m of landscaping. This landscaping will be implemented through individual development applications and may be indicated on and Precinct Plans, the stormwater drainage plan for the eastern catchment, and/or plans for construction of the Highway interchange	The Concept Proposal provides a buffer in the form depicted in **Figure 57** and detailed in **Section 3.3.3**. The Proposal facilitates compliance with Council requirements.

5.4 The Likely Impacts of Development

The environment of the site and the potential for impacts to that environment are presented in **Section 2.3** and **Section 2.4**, while the development and design responses that form the Proposal are presented in **Section 3.0**. A Statement of Environmental Effects is provided in **Section 4.0**, which communicates the potential impacts and how the Proposal responds by mitigation and/or amelioration.

The likely impacts of the Concept Proposal have been identified and investigated, and measures devised to ensure impacts are positive or at least minimised and manageable.

5.5 Suitability of the Site for the Development

The proposal complies with the relevant environmental planning instruments and Development Control Plan 2014.

The Statement of Environmental Effects confirms that the site is suitable and capable of sustaining the proposed subdivision.

The development will not interfere or require the negation of any of these restrictions sans the Covenant listed against Lot 4821 as this restriction specifically refers to development within the 1(a) Zone which is no longer applicable to the land.

5.6 Submissions Made in Accordance with the Act or regulations

There has been extensive agency and community consultation in respect of the KHURA during the rezoning, the infrastructure planning, and the DA preparation process.

A 2014 survey of 600 Port Stephens residents (200 households per ward) by *CT Group* found 72% support for the KHURA, with the balance mostly undecided or unfamiliar with the URA. Widely advertised Community information sessions were held on 2 occasions in June 2019, with each well attended. Positive feedback was observed around the prospect of significant investment in land for housing and the environment.

The proposal complies with the relevant statutory and strategic planning provisions, and the relevant planning instruments that apply to the land. As the Proposal is consistent with community expectations it is not envisaged that this application will raise significant objection. To that end, when the original DA was notified, it was noted that very few submissions were made for a project of this scale.

KHD will provide a formal response to Council further to any submissions during public notification..

5.7 The Public Interest

Approval of the Concept DA will enable the proponent to confidently focus resources and invest in the preparations for initial stages of the Proposal, concurrent to resolving all other preconditions necessary to enable the development of the land. The proposal is in the public interest to:

- finally commence implementation of the largest urban growth area in Port Stephens after 20 years of strategic planning;
- provide additional housing to meet with demand for housing in different market sectors, leading to greater housing diversity within Port Stephens;
- provide development in an area identified by local and regional planning strategies as a growth precinct of Port Stephen;
- provides additional population to the community creating the critical mass needed to ensure businesses and services in Raymond Terrace become economically and socially sustainable, including medical and public transport services;
- providing housing choice in a central location (close to employment areas of Raymond Terrace, Tomago, Heatherbrae, Williamtown airport);
- Ensure long term availability of affordable housing for low income earners and first home buyers in Port Stephens and beyond;
- increase, with the growth in population centered on Raymond Terrace, the pool of volunteers to serve community organisations in the Raymond Terrace area such as Volunteer Fire Service, Riding for Disabled, State Emergency Services et;.
- increase Section 7.11 Contributions, based on the Kings Hill Section 7.11 Contributions Plan to ensure community infrastructure is online expediently; and

- increase employment generation from the Urban Release Area as a result of the multiplier effect, delivering direct and indirect regional benefits of the kind identified in the Macroplan Kings Hill Economic Report 2019 (see **Section 4.11.3**).

Kings Hill URA is estimated to provide a direct $140 million in value into the local economy annually (see Macroplan - **Attachment S**), with expenditure on upfront infrastructure expected to total $105.4 million whilst the cost of the construction of the development is expected to total $1.1 billion (2018 dollars).

The proposal is clearly in the broader public interest to ensure that the Kings Hill Urban Release Area, which is 1 of 4 priority Urban Release Areas in the adopted Lower Hunter Regional Strategy of 2007, can now be realised.

6.0 CONCLUSION

The Concept Proposal will simplify the planning and implementation of the KHURA, providing a frame of reference for preparation and assessment of subsequent development applications for subdivision and development.

The proposal complies with relevant statutory and strategic planning provisions, and relevant planning instruments that apply to the land.

After five (5) years of consultation with the state government, specifically the Departments of Planning and Environment, Roads and Maritime Service, and more recently, Premiers and Cabinet, a Voluntary Planning Agreement (VPA) has been executed confirming arrangements for the funding and delivery of enabling infrastructure. This arrangement has unlocked the release area and with approval of the Concept Proposal, it will secure significant investment by KHD in the delivery of the URA.

Significant social and economic benefits derive from the KHURA. The URA will sustainably place affordable housing within some 20 minutes of about 50% of the new jobs forecast to occur in the Lower Hunter over the next 12 years.

When completed, the URA is estimated to provide a direct $140 million in value into the local economy annually, with expenditure on upfront infrastructure expected to total $105.4 million whilst the cost of the construction of the development is expected to total $1.1 billion (2018 dollars).

Construction of the development alone is expected to generate 177 full-time equivalent jobs per annum directly in the construction industry over a 15-year period, and ongoing full-time employment for some 279 residents when the development is completed. Investment from businesses located in the KHURA has the potential to provide direct ongoing employment for at least 885 people.

The 2019 undertaking by the NSW State government within the State VPA to upfront fund and deliver the enabling infrastructure during the initial years will stimulate the Hunter's economy. This reaffirms the State government's view that the Kings Hill Urban Release Area is the largest and most important release area in the 2036 time horizon for Port Stephens LGA (*Greater Newcastle Metropolitan Plan 2036*).

With 72% community support for the KHURA (2014 survey of 600 Port Stephens residents) Council is encouraged to recommend consent be granted to the application.