BROOKFIELD PIH PTY LIMITED
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135 King Street
SYDNEY NSW 2000

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Certificate of Registration on Change of Name

This is to certify that

WATER FACTORY COMPANY PTY LTD

Australian Company Number 136 272 298

did on the twenty-fifth day of June 2013 change its name to

FLOW SYSTEMS PTY LTD

Australian Company Number 136 272 298

The company is a proprietary company.

The company is limited by shares.

The company is registered under the Corporations Act 2001 and is taken to be registered in New South Wales and the date of commencement of registration is the twenty-seventh day of March, 2009.

CERTIFICATE

Issued by the
Australian Securities and Investments Commission
on this twenty-fifth day of June, 2013.

Greg Medcraft
Chairman

Aboriginal Heritage Impact Assessment

Lot 17 DP 870597, Lot 1 DP 785709
1431 and 1449 Hue Hue Road, Wyee NSW

Visual Inspection Date: 4 July 2013

Prepared by:

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Client Manager: Erin Williams
Report Number: PR118450
Version / Date: Final/July 2013

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IMPORTANT NOTE

We have prepared this report for the sole purposes of EG Property Group ("**Client**") for the specific purpose of only for which it is supplied ("**Purpose**"). This report is strictly limited to the purpose and the facts and matters stated in it; it does not apply directly or indirectly and will not be used for any other application, purpose, use or matter.

In preparing this report we have made certain assumptions. We have assumed that all information and documents provided to us by the Client or as a result of a specific request or enquiry were complete, accurate and up-to-date. Where we have obtained information from a government register or database, we have assumed that the information is accurate. Where an assumption has been made, we have not made any independent investigations with respect to the matters the subject of that assumption. We are not aware of any reason why any of the assumptions are incorrect.

Document Status

Version	Purpose of Document	Orig	Review	Review Date	Approval for Issue	Date Issued
Draft	Aboriginal Heritage Impact Assessment	KV	EW	11/07/2013	EW	12/07/2012
Final	Aboriginal Heritage Impact Assessment	KV	EW	18/07/2013	EW	18/07/2013

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Executive Summary

RPS has been engaged by EG Property Group to prepare an Aboriginal Heritage Impact Assessment (AHIA) for Lot 17 DP 870597 and Lot 1 DP 785709 on Hue Hue Road, Wyee. Both lots are located in the Lake Macquarie Local Government Area (LGA), and are collectively referred to as the 'Project Area' throughout this report.

This AHIA has been prepared to accompany a Development Application (DA) to Lake Macquarie City Council for Stage 1 Bulk Earthworks within a 0.5 hectare area situated within the Project Area. This area is an arbitrary piece of land without legal boundaries, which straddles both of the abovementioned lots, and is referred to as the 'Activity Area' throughout this report.

This assessment has been undertaken in accordance with the *Lake Macquarie Aboriginal Heritage Management Strategy* ('Management Strategy') (Umwelt 2011) and the *Due Diligence Code of Practice for the Protection of Aboriginal Objects* ('Due Diligence Code') (DECCW 2010).

Investigations under the Management Strategy (Umwelt 2011) and the Due Diligence Code (DECCW 2010) have included the following:

- A search of the Aboriginal Heritage Information Management System (AHIMS) database. This search identified that there were three previously recorded Aboriginal sites in the Project Area; an artefact scatter, an isolated artefact, and a stone arrangement. None of these sites were located in or within 100 metres of the Activity Area, and will not be impacted by the proposed activity.
- A consideration of the landforms: land within 200 metres of water, dune systems, ridgetops, headlands, and land immediately above or below cliff faces and/or rockshelters/cave. Land within 200 metres of water was identified in the Project Area.
- A desktop assessment, which included a review of previous archaeological and heritage studies in the vicinity of the Project Area.
- A visual inspection of the Project Area. The previously registered AHIMS sites #45-3-3425 (artefact scatter) and #45-3-3445 (stone arrangement) were able to be relocated. The previously registered AHIMS site #45-3-3424 (artefact scatter) was not able to be relocated. No other Aboriginal objects or places were identified in the Project Area.
- AHIMS site #45-3-3445 (stone arrangement) was determined to be of modern origin and resulting from the removal of sandstone blocks from the access track. An Aboriginal Site Inspection Recording (ASIR) form will be submitted to the Office of Environment and Heritage reflecting this, and requesting that the site be listed as "not valid".
- AHIMS site #45-3-3424 (artefact scatter) was originally located on the northern bank of Mannering Creek. This entire site has been destroyed by recent flood events, and as such an Aboriginal Site Inspection Recording (ASIR) form will be submitted to the Office of Environment and Heritage reflecting this, and requesting that the site be listed as "not valid".

RECOMMENDATIONS

The following recommendations have been made in relation to the proposed activity, which includes bulk earthworks within the Activity Area and the construction of a new section of access track.

Recommendation 1

There are no Aboriginal sites located in or within 100 metres of the Activity Area, and therefore an Aboriginal Heritage Impact Permit (AHIP) is not required for the proposed activity.

Recommendation 2

All relevant EG Property Group staff and contractors should be made aware of their statutory obligations for heritage under the *National Parks and Wildlife Act* 1974 and the *Heritage Act* 1977, which may be implemented as a heritage induction. As part of this induction, all staff and contractors should be made aware of the location of registered AHIMS sites within the Project Area.

Recommendation 3

This due diligence assessment should be kept by EG Property Group so that it can be presented, if needed, as a defence from prosecution under Section 86(2) of the *National Parks and Wildlife Act* 1974.

Recommendation 4

If unrecorded Aboriginal object/s are identified in the Project Area during works, then all works in the immediate area must cease and the area should be cordoned off. OEH must be notified by ringing the Enviroline 131 555 so that the site can be adequately assessed and managed.

Recommendation 5

In the unlikely event that skeletal remains are identified, work must cease immediately in the vicinity of the remains and the area must be cordoned off. The proponent must contact the local NSW Police who will make an initial assessment as to whether the remains are part of a crime scene or possible Aboriginal remains. If the remains are thought to be Aboriginal, OEH must be contacted by ringing the Enviroline 131 555. An OEH officer will determine if the remains are Aboriginal or not; and a management plan must be developed in consultation with the relevant Aboriginal stakeholders before works recommence.

Recommendation 6

If, during the course of development works, suspected historic heritage material is uncovered, work should cease in that area immediately. The Heritage Branch, Office of Environment & Heritage (Enviroline 131 555) should be notified and works only recommence when an approved management strategy has been developed.

Terms, Definitions, and Abbreviations

Abbreviation/ Term	Meaning
Aboriginal Object	"any deposit, object or material evidence (not being a handicraft made for sale) relating to the Aboriginal habitation of the area that comprises NSW, being habitation before or concurrent with (or both) the occupation of that area by persons of non-Aboriginal extraction, and includes Aboriginal remains" (DECCW 2010:18).
Aboriginal Place	"a place declared under s.84 of the NPW Act that, in the opinion of the Minister, is or was of special significance to Aboriginal culture" (DECCW 2010:18). Aboriginal places have been gazetted by the minister.
Aboriginal Culturally Modified Tree	"means a tree that, before or concurrent with (or both) the occupation of the area in which the tree is located by persons of non-Aboriginal extraction, has been scarred, carved or modified by an Aboriginal person by: (a) the deliberate removal, by traditional methods, of bark or wood from the tree, or (b) the deliberate modification, by traditional methods, of the wood of the tree" NPW Regulation 80B (3). Culturally Modified trees are sometimes referred to as scarred trees
Activity	A project, development, or work (this term is used in its ordinary meaning and is not restricted to an activity as defined by Part 5 EP&A Act 1979).
Activity Area	Activity Area is the area subject to the proposed activity
AHD	Australian Height Datum
AHIA	Aboriginal Heritage Impact Assessment
AHIMS	Aboriginal Heritage Information Management System
AHIP	Aboriginal Heritage Impact Permit
ASIR Form	Aboriginal Site Impact Recording Form
DECCW	Department of Environment, Climate Change and Water (is now the Office of Environment and Heritage – OEH)
Disturbed Land	"Land is disturbed if it has been the subject of a human activity that has changed the land's surface, being changes that remain clear and observable." (DECCW 2010:18).
Due Diligence	"taking reasonable and practical steps to determine whether a person's actions will harm an Aboriginal object and, if so, what measures can be taken to avoid that harm" (DECCW 2010:18)
EP&A Act	*Environmental Planning and Assessment Act 1979 (NSW)*
GDA	Geodetic Datum Australia
Harm	"destroy, deface, damage an object, move an object from the land on which it is situated, cause or permit an object to be harmed." (DECCW 2010:18)
LALC	Local Aboriginal Land Council
LEP	Local Environment Plan
LGA	Local Government Area
NPWS	National Parks and Wildlife Service
NPW Act	*National Parks and Wildlife Act 1974* (NSW)
NPW Regulation	*National Parks and Wildlife Regulation 2009* (NSW)
OEH	Office of Environment and Heritage (formerly DECCW)
PAD	Potential Archaeological Deposit
Project Area	Project Area is the area subject to the desktop study in this report
WRF	Water Recycling Facility

1.0 Introduction

RPS has been engaged by EG Property Group (the proponent) to prepare an Aboriginal Heritage Impact Assessment (AHIA). This AHIA has been prepared to accompany a Development Application (DA) to Lake Macquarie City Council for Stage 1 Bulk Earthworks within the Activity Area (as described below), and has been prepared in accordance with the *Lake Macquarie Aboriginal Heritage Management Strategy* ('Management Strategy') (Umwelt 2011) and the *Due Diligence Code of Practice for the Protection of Aboriginal Objects* ('Due Diligence Code') (DECCW 2010).

Lake Macquarie City Council has requested that an AHIA accompany the DA for Stage 1 bulk earthworks to be undertaken within the Activity Area (as described below). This report has outlined the relevant environmental and archaeological context, landforms, landscape features, disturbances, legislative context and the nature of the proposed activity. This information has been considered in formulating the recommendations.

1.1 The Project Area

The Project Area, which is the subject of this AHIA, comprises the properties at 1431 and 1449 Hue Hue Road, Wyee. These properties are legally described as Lot 17 DP 870597 and Lot 1 DP 785709, and are located in the Lake Macquarie Local Government Area (LGA). The Project Area is located within the town of Wyee, and is approximately 105 hectares in size (Figure 1). These properties have been used for cattle grazing and dairy farming since the mid-1800s.

The area subject to the proposed activity is an arbitrary piece of land within the Project Area, which measures 0.5 hectares in size and straddles both of the abovementioned lots. This area is the proposed site for the construction of a Water Recycling Facility (WRF), and is herein referred to as the 'Activity Area' (Figure 1). The Activity Area is classified as 'Zone 5 – Infrastructure Zone' under the Lake Macquarie Local Environmental Plan (Lake Macquarie City Council 2013: Map Sheet 1).

In addition to this area, a proposed new section of access track measuring approximately 220 metres, which will connect an existing gravel access track with the proposed WRF site, will need to be constructed as part of the proposed works. As such, this proposed new section of access track is considered as part of the Activity Area for the purposes of this AHIA (Figure 1).

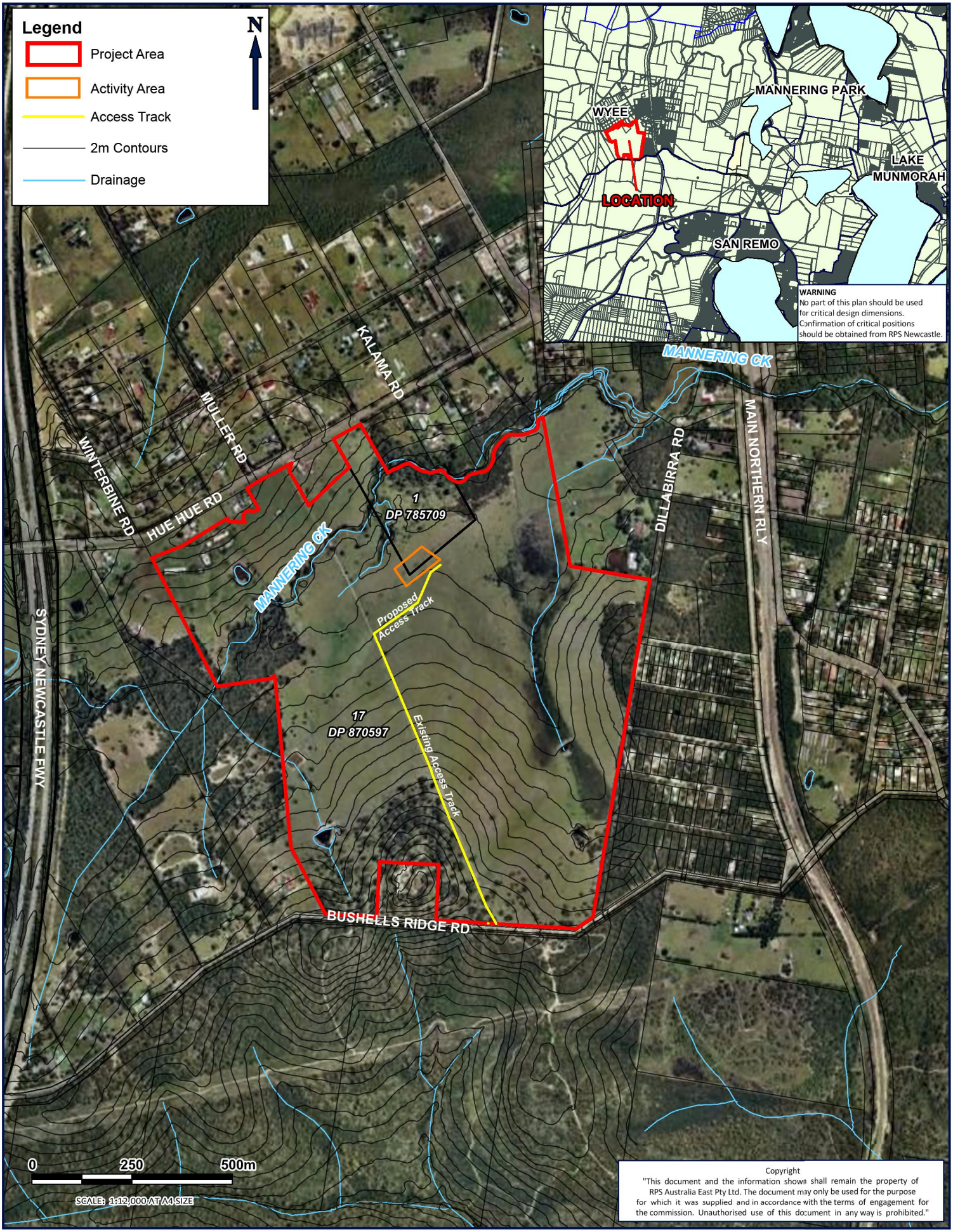
Neither the Project Area nor the Activity Area it encompasses is located within a Sensitive Aboriginal Cultural Landscape (Umwelt 2011: 6.3).

1.2 The Proposed Activity

The proposed activity is to prepare the Activity Area for the construction of a proposed WRF. This will involve bulk earthworks within the proposed WRF site. Additionally, a new section of access track, which will connect an existing gravel track with the proposed WRF site, will also need to be constructed as part of the proposed works (see Figure 1).

1.3 Authorship and Acknowledgements

This report was prepared by RPS Cultural Heritage Consultant Karyn Virgin and reviewed by RPS Cultural Heritage Consultant Erin Williams.



TITLE: FIGURE 1: PROJECT AREA WITH ACTIVITY AREA & PROPOSED ACCESS

LOCATION: WYEE

DATUM: (GDA 94)
PROJECTION: MGA ZONE 56

DATE: 10/07/2013
PURPOSE: HERITAGE

LAYOUT REF: \Projects\Conics_Sydney\PR118450 - Hue Hue Rd Wyee\Drafting\MapInfo Workspaces\Arch
VERSION (PLAN BY): A A4 (EW-KV-NW)

CLIENT: .
JOB REF: PR 118540-1

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RPS

2.0 Legislative and Statutory Planning Context

The following overview of the legal framework is provided solely for information purposes for the client, it should not be interpreted as legal advice. RPS will not be liable for any actions taken by any person, body or group as a result of this general overview, and recommend that specific legal advice be obtained from a qualified legal practitioner prior to any action being taken as a result of the summary below.

Although there are a number of Acts protecting and managing cultural heritage in New South Wales (see Appendix 1); the primary ones which apply to this report include:

- *National Parks & Wildlife Act 1974*
- *National Parks & Wildlife Regulation 2009*

In brief, the *National Parks & Wildlife Act 1974* protects Aboriginal heritage (places, sites and objects) within NSW; the National Parks and Wildlife Regulation 2009 provides a framework for undertaking activities and exercising due diligence.

2.1 *National Parks & Wildlife Act 1974*

The *National Parks & Wildlife Act 1974* (NPW Act) protects Aboriginal heritage (places, sites and objects) within NSW. Protection of Aboriginal heritage is outlined in s86 of the Act, as follows:

- "A person must not harm or desecrate an object that the person knows is an Aboriginal object" s86(1),
- "A person must not harm an Aboriginal object" s86(2)
- "A person must not harm or desecrate an Aboriginal place" s86(4).

Penalties apply for harming an Aboriginal object or place. The penalty for knowingly harming an Aboriginal object (s86[1]) and/or an Aboriginal place (s86[4]) is up to $550,000 for an individual and/or imprisonment for 2 years; and in the case of a corporation the penalty is up to $1.1 million. The penalty for a strict liability offence (s86[2]) is up to $110,000 for an individual and $200,000 for a corporation.

Harm under the NPW Act is defined as any act that; destroys defaces or damages the object, moves the object from the land on which it has been situated, causes or permits the object to be harmed. However, it is a defence from prosecution if the proponent can demonstrate 1) that harm was authorised under an Aboriginal Heritage Impact Permit (AHIP) (and the permit was properly followed), or 2) that the proponent exercised due diligence in respect to Aboriginal heritage. The **'due diligence' defence (s87(2))**, states that if a person or company has exercised due diligence to ascertain that no Aboriginal object was likely to be harmed as a result of the activities proposed for the Project Area (subject area of the proposed activity); then liability from prosecution under the NPW Act will be removed or mitigated if it later transpires that an Aboriginal object was harmed.

Notification of Aboriginal Objects

Under section 89A of the NPW Act Aboriginal objects (and sites) must be reported to the Director-General (now Chief Executive) of OEH within a reasonable time (unless it has previously been recorded and submitted to AHIMS). Penalties of $11,000 for an individual and $22,000 for a corporation may apply for each object not reported.

2.2 *National Parks and Wildlife Regulation 2009*

The *National Parks and Wildlife Regulation 2009* ("NPW Regulation") provides a framework for undertaking activities and exercising due diligence in respect to Aboriginal heritage. The NPW Regulation 2009 outlines the recognised due diligence codes of practice which are relevant to this report, but it also outlines procedures for AHIP applications and Aboriginal Cultural Heritage Consultation Requirements (ACHCRs); amongst other regulatory processes.

2.3 Due Diligence and Codes of Practice

The aims of a due diligence assessment are to:

- assist in avoiding unintended harm to Aboriginal objects;
- provide certainty to land managers and developers about appropriate measures for them to take;
- encourages a precautionary approach;
- provides a defence against prosecution if the process is followed; and
- results in more effective conservation outcomes for Aboriginal cultural heritage.

One of the benefits of the due diligence provisions are that they provide a simplified process of investigating the Aboriginal archaeological context of an area to determine if an AHIP is required.

Under the s80A *National Parks & Wildlife Regulation* 2009 ("NPW Regulation") a number of due diligence codes are recognised.

This report has been written to meet the Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales (2010) ("Due Diligence Code").

2.3.1 *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* (DECCW 2010)

This publication sets out a minimum benchmark for acceptable due diligence investigations to be followed. The purpose of the code is set out reasonable and practical steps in order to:

(1) identify whether or not Aboriginal objects (and places) are, or are likely to be, present in an area

(2) determine whether or not their activities are likely to harm Aboriginal objects (if present)

(3) determine whether an AHIP application is required. (DECCW 2010:2)

Investigations under the code include the following:

- A search of the Aboriginal Heritage Information Management System (AHIMS) database to identify if there are previously recorded Aboriginal objects or places in the Project area,
- Identification of landscape features including, land within 200m of water, dune systems, ridgetops, headlands, land immediately above or below cliff faces and/or rockshelters/caves,
- Desktop assessment including a review of previous archaeological and heritage studies and any other relevant material,
- Visual inspection of the project area to identify if there are Aboriginal objects present, and
- Assessment as to whether an AHIP is required.

This report has complied with the requirements of the code listed above. Other requirements under the code are outlined below.

Aboriginal consultation is not required for an investigation under the due diligence code (DECCW 2010:3). However, if the due diligence investigation shows that the activities proposed for the area are likely to harm objects or likely objects within the landscape, then an Aboriginal Heritage Impact Permit will be required with full consultation.

A record of the due diligence procedure followed must be kept to ensure it can be used as a defence from prosecution (DECCW 2010:15).

Following a due diligence assessment (where an AHIP application was not required), an activity must proceed with caution. If any Aboriginal objects are identified during the activity, then works should cease in that area and OEH notified (DECCW 2010:13). The due diligence defence does not authorise continuing harm.

2.4 Lake Macquarie City Council Aboriginal Heritage Management Strategy

Lake Macquarie City Council has requested that an AHIA accompany the DA for Stage 1 bulk earthworks to be undertaken within the Activity Area. Under the Management Strategy, AHIAs must include the information identified in Table 6.2 of the Management Strategy (Umwelt 2011: 6.5-6.7) (refer Appendix 4). This report fulfils Lake Macquarie City Council's requirements for AHIA under the Management Strategy (refer Section 8.1)

2.5 Aboriginal Community Consultation

Consultation with representatives of the local Aboriginal community is a requirement of an Aboriginal AHIA under the Management Strategy (Umwelt 2011: 6.7) (refer Appendix 4). The consultation process involved telephone conversations with Bahtabah Local Aboriginal Land Council, Awabakal Descendants Traditional Owners Aboriginal Corporation, Awabakal Traditional Owners Aboriginal Corporation and Guringai Tribal Link to determine whether the Project Area had specific non-archaeological cultural values to the local Aboriginal community.

The consultation process is tabulated in Appendix 3.

3.0 Environmental Context

The purpose of reviewing the relevant environmental information is to assist in identifying whether Aboriginal objects or places are present within the Project Area. The environmental context forms part of the desktop assessment required under the Due Diligence Code (DECCW 2010:12-13).

3.1 Geology and Soils

Aboriginal people typically made stone tools using siliceous, metamorphic or igneous rocks and therefore understanding the local geology can provide important information regarding resources in a study area. The nature of stone exploitation by Aboriginal people depends on the characteristics of the source, for example whether it outcrops on the surface (a primary source), or whether it occurs as gravels (a secondary source) (Doelman, Torrence et al. 2008).

The Project Area is situated across both Quaternary alluvial sands and the Narabeen Group. Quaternary alluvial sands comprise minor gravels, sand and clay, while the Narabeen Group comprises claystone, lithic sandstone and shale. Typically, there are no raw stone materials suitable for the manufacture of stone tools and/or artefacts in Quaternary sands; however, shell midden sites are commonly recorded in alluvial sands (Attenbrow 2003: 51). The presence of sandstone in the Narabeen Group is significant as sandstone sheets were often used for sharpening hatchets; this process results in depressions in the sandstone identified as 'grinding grooves' (Attenbrow 2003: 120-122).

The Project Area is situated across two soil landscapes; the Gorokan soil landscape in the southern portion of the Project Area, and the Wyong soil landscape in the northern portion of the Project Area. The Activity Area is situated wholly on the Wyong soil landscape. The Gorokan soil landscape typically comprises loose dark brown loamy sand A^1 horizon topsoil, yellowish brown hardsetting clayey sand A^2 horizon topsoil, and yellowish brown strongly pedal clay B horizon subsoil (Murphy 1993: 56-57). Topsoil depth is typically between 45 and 60 centimetres, before a distinct change to subsoil (Murphy 1993: 57-58). The Wyong soil landscape is characterised by brownish black pedal loam A horizon topsoil, and mottled brownish grey plastic clay B horizon subsoil (Murphy 1993: 81-82). Topsoil depth is typically between 10 and 40 centimetres. It is not anticipated that Aboriginal artefacts will be present in subsoil layers of either soil landscape. Therefore, potential archaeological deposits, if present, are likely to be limited to the topsoil layers (upper 10 to 60 centimetres) of these soil landscapes.

3.2 Topography and Hydrology

The Project Area is situated on land that slopes gently downwards towards the north and Mannering Creek, with a general elevation of around 30 metres Australian Height Datum (Land and Property Information 2013). The Activity Area is situated on relatively flat land near to the base of this slope. Several water sources are located within and near to the Project Area. Mannering Creek runs through the northern portion of the Project Area in an east-west direction, while Spring Creek is located approximately 710 metres to the south. The Project Area is located approximately 11 kilometres west of the Tasman Sea, and is located within 10 kilometres of a number of lakes including Budgewoi Lake, Lake Munmorah, Mannering Lake, Lake Macquarie, Colongra Lake, and Tuggerah Lake.

The Wyong soil landscape, on which the northern portion of the Project Area is located, is characterised by broad, poorly drained floodplains, alluvial flats, levees and areas of swamp (Murphy 1993: 81). The southern portion of the Project Area falls within the Gorokan soil landscape, which is characterised by undulating low hills and rises, broad crests, ridges with long gently inclined slopes and broad drainage lines (Murphy 1993: 56).

The topography and hydrology of the Project Area demonstrate that the landscape would have been habitable for past populations; the area would have provided sufficient water resources and been fertile enough to sustain human occupation.

3.3 Flora and Fauna

The purpose of this section is to provide an indication of the types of flora and fauna resources which are likely to have been available to Aboriginal people in the past. It is based on broad scale vegetation mapping for NSW (Keith 2006) and does not replace more detailed studies undertaken for the Project Area.

The Project Area is situated primarily within the Sydney Coastal Dry Sclerophyll Forests, but is also partially situated within the Coastal Floodplain Wetlands and the Coastal Heath Swamps. The Sydney Coastal Dry Sclerophyll Forest is the most diverse of the Sydney dry sclerophyll forests and encompasses a wide range or related forest and woodland communities. The species composition and structure of this community varies according to topography and soil moisture, with the open eucalypt canopy varying between 10 and 25 metres tall depending on associated landforms (Keith 2006: 146).

Common tree species found within this community include the Sydney red gum, red bloodwood, Sydney peppermint, brown stringybark, various species of scribbly gum and the old man banksia. The community is also characterised by a shrub layer that features various species of wattle and banksia, as well as the mountain devil, flaky-barbed teatree, broad-leaved geebung and the grass tree. Typical grasses include wiry panic, oat speargrass, heath bog-rush and black bog-rush (Keith 2006: 147).

The Coastal Heath Swamps are extensive treeless areas largely restricted to poorly drained depressions associated with swales (Keith 2006: 208). Due to substantial surface water flows and groundwater seepage, a watertable is maintained above the sandstone bedrock or hard sand dune subsoil across this vegetation community (Keith 2006: 208). Common species in the Coastal Heath Swamps include various banksia species, dagger hakea, prickly teatree, native broom, milkmaids, fringe-lily, wiry panic, spreading rope-rush and wallaby grass (Keith 2006: 209).

The Coastal Floodplain Wetlands are located on periodically inundated floodplains, and are likely to now comprise only degraded fragments and patches of regrowth vegetation due to extensive clearance and agricultural development (Keith 2006: 226). Common species in this vegetation community are likely to have included broad-leaved apple, flooded gum, Sydney blue gum, forest red gum, Moreton Bay Fig, swamp paperbark, common rush, spiny-headed mat-rush, and common reed (Keith 2006: 227).

These vegetation communities would have provided habitats for a variety of animals, as well as potential food and raw material sources for Aboriginal people. Grass trees, for example, were used by Aboriginal people to manufacture spears and resin, and also as a food source (Nash 2004: 5). Various banksia species were collected and used to manufacture needles for basket and mat weaving, while the fruit of the geebung was eaten and string and fishing lines were soaked in a geebung bark infusion to prevent fraying (Nash 2004: 2, 4). Eucalyptus trees were a particularly important resource; leaves were crushed and soaked for medicinal purposes, bowls, dishes, and canoes were made from the bark, and spears, boomerangs and shields were crafted from the hard wood (Nash 2004: 4-8).

Typical animals which may have been harvested by Aboriginal people include kangaroos, wallabies, sugar gliders, possums, echidnas, a variety of lizards and snakes, birds, as well as rats and mice. The bones of such animals have been recovered from Aboriginal sites excavated in the Sydney region suggesting that they were sources of food (Attenbrow 2003:70-76), although the hides, bones and teeth of some of the larger mammals may have been used for Aboriginal clothing, ornamentation, or other implements.

3.4 Synthesis of Environmental Context

A review of the environmental context of the Project Area suggests that prior to European settlement the landscape would have been suitable for occupation. Food and raw material resources were available, and a number of water courses are located in the area.

4.0 Heritage Context

The purpose of reviewing the relevant heritage information is to assist in identifying whether Aboriginal objects or places are present within the Project Area. The heritage context forms part of the desktop assessment required under the Due Diligence Code (DECCW 2010:12-13).

4.1 Aboriginal Heritage Information Management System (AHIMS)

A search of the Aboriginal Heritage Information Management System (AHIMS) was undertaken on 21 June 2013, within the following coordinates: GDA Zone 56, Eastings 355734 to 360734 and Northings 6324630 to 6329605. This search revealed 15 valid sites within the searched coordinates, of which **three were located within the Project Area** (Table 2).

These sites were all recorded by Insite Heritage in 2010 (Insite Heritage 2010). **None of these sites were located in or within 100 metres of the Activity Area**.

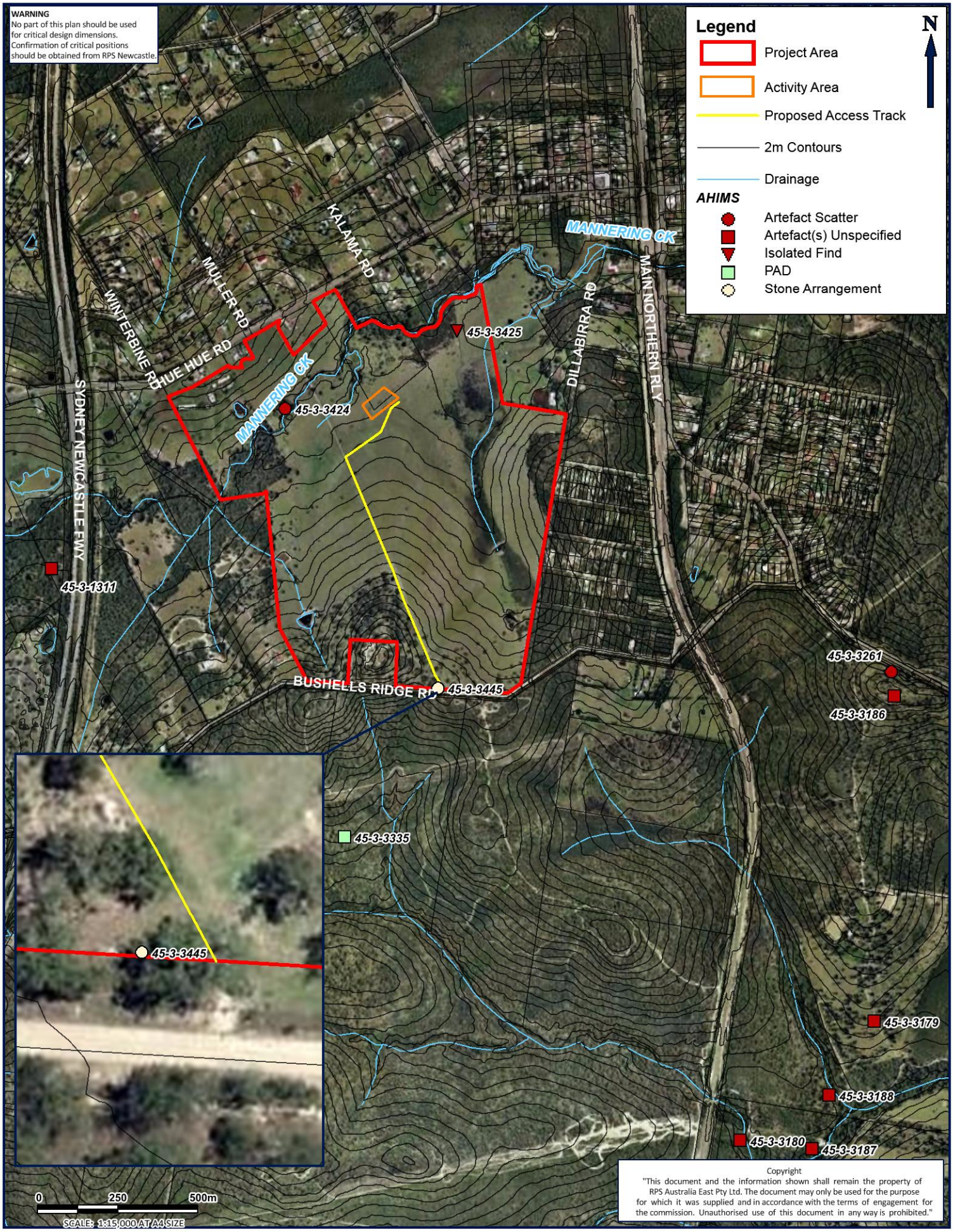
Table 1 : Summary of AHIMS Sites within the Project Area

Sites	Frequency	Percent
Isolated Artefact	1	33.3%
Artefact Scatter	1	33.3%
Stone Arrangement	1	33.3%
Total	**3**	100%

AHIMS site #45-3-3445 was recorded as a possible stone formation located on the northern side of a large tree in the southern portion of the current Project Area. The site was described as being situated at the top of a gentle slope that faced north (Insite Heritage 2010: 26). The formation comprised a stack of 12 sandstone stones, which covered an approximate area of 780 x 880 millimetres at the base of a eucalypt tree (Insite Heritage 2010: 26).

AHIMS site #45-3-3425 was recorded as an artefact scatter located on an exposure adjacent to a fence. It was identified on spoil from an excavation trench that had been dug underneath the fence. The artefact scatter was recorded over a total area of 20 square metres, and included a red brown silcrete flake, two red brown silcrete fragments, and a mudstone flake(Insite Heritage 2010: 26).

AHIMS site #45-3-3424 was recorded as an artefact scatter located on the northern side of Mannering Creek, with three artefacts identified on a small cattle track, two identified on the eroded face of the creek bank, and an isolated artefact identified on an exposure at the base of a tree. The total number of recorded artefacts was six (a chert flake, a basalt flake, a quartzite flake and three flakes of unidentified fine-grained siliceous material) and the artefact scatter was recorded over an area approximately 22 metres wide (Insite Heritage 2010: 25).



TITLE: FIGURE 2: PROJECT AREA WITH AHIMS

LOCATION: WYEE

DATUM: (GDA 94)
PROJECTION: MGA ZONE 56

DATE: 18/07/2013
PURPOSE: HERITAGE

LAYOUT REF: \Projects\Conics_Sydney\PR118450 - Hue Hue Rd Wyee\Drafting\MapInfo Workspaces\Arch
VERSION (PLAN BY):C A4 (EW-KV-NW)

CLIENT: .
JOB REF: PR 118540-1

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RPS

4.2 Archaeological and Heritage Literature Review

A review of previous archaeological and heritage reports has been undertaken to inform this due diligence assessment.

Insite Heritage, 2010, Aboriginal and European Heritage Assessment, Hue Hue Road, Wyee

In 2010 Insite Heritage was commissioned by Conics Pty Ltd to prepare an Aboriginal and European heritage assessment for proposed rezoning to allow residential development within a 165 hectare area in Wyee, New South Wales. The study area was located to the south of Hue Hue Road, and to the north of Bushells Ridge Road. The study area investigated in Insite's 2010 assessment is the same as the 'Project Area' under investigation by RPS and considered in this report.

Within the study area, four historic features were identified. This included an historic subdivision layout, which dated from 1914, and three historic survey marker trees. It was recommended that the names of streets within the historic layout be retained within any future development, as they were 'of interest' and may have been Awabakal in origin. It was further recommended that the survey marker trees be listed on the Lake Macquarie Local Environmental Plan and retained *in situ* where possible, or otherwise avoided by the proposed development.

During the field survey of the study area, three Aboriginal sites were identified and recorded, including two artefact scatters along Mannering Creek, and a stack of sandstone blocks on the southern boundary of the study area. These sites were recorded in the AHIMS database as #45-3-3425, #45-3-3424, and #45-3-3445 (refer Section 4.1 above). A total of nine artefacts were recorded at the two artefact scatter sites; mudstone, silcrete, chert, quartzite and basalt were the identified raw stone materials, and the recorded artefacts were predominately flakes. It was noted by the authors that as the artefact sites were identified along the creek line, which was subject to periodic flooding and had minimal ground surface visibility, it was difficult to determine the spatial extent of the sites.

It was recommended that additional sub-surface test excavation be undertaken to determine the impact that development may have on identified sites. Ultimately, it was not anticipated that heritage values would act as a significant constraint to the proposed development.

RPS, 2011, Cultural Heritage Report: Wyee Point Reserve

In 2011 RPS were commissioned by Lake Macquarie City Council to prepare a Cultural Heritage Report for the Wyee Point Reserve. At the time, Lake Macquarie City Council was proposing to develop the Reserve as a public recreation facility. The report was prepared to address potential impact on any Aboriginal or historic heritage within the Reserve, which measured approximately 27 hectares and was bounded by Lake Macquarie to the north and east.

The archaeological field survey of the Reserve indicated that the area had been subject to minor levels of impact associated with vegetation disturbance and clearance. Visibility and access in the area was limited by dense vegetation, leaf and bark litter.

As a result of the field survey, the recorded boundaries of a previously registered shell midden site (AHIMS #45-7-0190) were extended, and a new shell midden site was identified. The report recommended that for proposed earthworks to proceed in areas where sites have been recorded, Council would be required to submit an Aboriginal Heritage Impact Permit, which would be supported by an Aboriginal Cultural Heritage Assessment report. It was also recommended that for earthworks to proceed in the vicinity of recorded sites, test excavation should be conducted to determine whether subsurface archaeological material was present.

Streat Archaeological Services, 2013, Proposed Wastewater Management Plant at Part of Lot 17 DP 870597, Hue Hue Road, Wyee

In 2013 Streat Archaeological Services (in conjunction with Archaeological Management and Consulting Group) were engaged by EG Property Group to prepare a Due Diligence Assessment for a proposed wastewater management facility at Lot 17 DP 870597, Hue Hue Road, Wyee. The project area investigated by Streat was approximately 0.5 hectares in size, and is the same as the 'Activity Area' under investigation by RPS and considered in this report.

The wider study area was observed to have been completely cleared of native vegetation and been subject to livestock grazing and infrequent vehicle traffic. Two water courses were identified as being located within 200 metres of the wider study area.

Based on the background analysis of the environmental and archaeological context of the wider study area, it was determined that sub-surface Aboriginal objects with potential conservation value may be present within the wider study area.

4.3 Synthesis of Heritage Context

A review of the AHIMS data and previous archaeological work in the area suggest that the most common site types in the area are stone artefact sites followed by stone arrangements, and shell middens associated with Lake Macquarie. Artefact sites in the area have typically been found in close proximity to watercourses, though the impacts of flooding and erosion are likely to have impacted the integrity of these sites.

The reviewed reports have acknowledged that the general Wyee area has been subject to disturbance since the mid 1800s by way of agricultural use and urban development.

5.0 Visual Inspection and Field Results

A visual inspection of the Project Area was undertaken to identify whether Aboriginal objects were present on the ground surface or were likely to be present below the ground surface. In accordance with the Due Diligence Code and the Management Strategy, a qualified archaeologist undertook the visual inspection (DECCW 2010:12-13; Umwelt 2011: 6.7).

5.1 Visual Inspection

The visual inspection of the Project Area was undertaken on 4 July 2013 by RPS Cultural Heritage Consultants Erin Williams and Karyn Virgin. The visual inspection was conducted on foot (pedestrian).

The Project Area was accessed via Bushells Ridge Road, which borders the Project Area to the south (Plate 1). An existing access track ran from Bushells Ridge Road to the northern boundary of the Project Area; the Activity Area is located east of the existing access track and as such a small section of access track will be formed as part of the proposed works (refer Figure 2). The general area was observed to have been disturbed by previous vegetation clearance, vehicle access, livestock grazing, and the construction and installation of fences, access tracks, boreholes, and agricultural structures such as stockyards and a dam (Plates 2-5). A number of residential properties were also located along the northern and western boundaries of the Project Area; RPS did not have permission to access these properties, and as such they were not subject to visual inspection.

The northern portion of the Project Area is located on an area of swampy floodplain associated with the Wyong soil landscape; the ground surface in this area was inundated with water at the time of the visual inspection (Plate 6). In addition to this, Mannering Creek runs directly through the north of the Project Area in an east-west direction (Plate 7). Due to the high water level, as well as the density of vegetation associated with this water course and the swampy floodplain, the visual inspection of the northern portion of the Project Area was limited to accessible areas.

An unnamed drainage line was also observed along the western boundary of the Project Area. This drainage line was also observed to be heavily vegetated, and the associated ground surface was also inundated with water at the time of the visual inspection (Plate 8). This limited effective survey coverage in the westernmost portion of the Project Area.

Although vegetation has been extensively cleared from within the Project Area for agricultural purposes, patches of regrowth vegetation were observed along the Project Area boundaries and in association with the drainage lines. Along the drainage lines, observed vegetation species included blackberry, common bracken, spiny-headed mat-rush, old man banksia, and various wattle species (Plate 9). Elsewhere in the Project Area various species were observed including blady grass, whisky grass, grass trees, melaleuca, and various eucalypts such as scribbly gum, Sydney red gum and spotted gum (Plate 10). The presence of regrowth vegetation, bracken and blackberry bushes in the Project Area is indicative of the extent to which the landscape has been previously disturbed; blackberry and bracken are both primary successive species, and are indicative of localised ground disturbance

Where visible, soil was observed to be yellow orange silty sand of an indeterminate depth. Ground surface visibility was limited (less than 5%) as dense ground cover of grasses, dense vegetation and leaf litter (Plate 11). Areas of exposure were also limited (less than 5%), and occurred primarily in association with access tracks, the bases of large trees, and disturbed areas (Plate 12). Observed lithic material included shale, chert pebbles, and sandstone; none of the observed lithic material was suitable for stone tool manufacture due to limited quality and size.

During the visual inspection, Mannering Creek was observed to have been subject to recent flooding caused by heavy rain; the banks had clearly been affected by the impacts of water erosion. Due to the extent to which the area has been disturbed by flooding and erosion, the previously registered AHIMS site #45-3-3424 (artefact scatter) was not able to be relocated (Plate 13), and it is suspected that any cultural material has been washed away. An ASIR form will be submitted to the Office of Environment and Heritage reflecting this, and requesting that the site be listed as "not valid".

The registered GPS location of AHIMS site #45-3-3425 (artefact scatter) was thoroughly inspected. A red silcrete flake and a red silcrete fragment, which had been previously recorded (Insite Heritage 2010: 26), were relocated on a bund wall formed by the spoil of a drainage ditch (Plate 14). None of the other originally recorded artefacts were able to be relocated, and no additional artefacts were identified. The recorded location for this site has been disturbed by the nearby installation of fencing, cattle grazing, and the excavation of a drainage ditch running parallel to the fenceline measuring approximately 0.5 metres in width (Plate 15). The artefacts associated with this site were not considered to be in their primary context and it is highly likely that they were uncovered during the excavation of the drainage ditch.

The registered GPS location of AHIMS site #45-3-3445 (stone arrangement) was thoroughly inspected, and this site was relocated. This site is an arrangement of sandstone blocks at the base of a eucalypt tree, located approximately 12.4 metres to the west of the existing access track. The arrangement remains in the condition in which it was originally recorded, although vegetation growth around the base of the tree has partially obscured the sandstone blocks (Plate 16). RPS believes that this stone arrangement is not Aboriginal in origin, and is likely to represent the clearance of sandstone blocks from the existing access track. An ASIR form will be submitted to the Office of Environment and Heritage reflecting this, and requesting that the site be listed as "not valid".

The Activity Area was thoroughly inspected; original vegetation was completely cleared from the Activity Area for its conversion to pasture, and the general area had been disturbed by cattle grazing and the installation of fencing (Plate 17).

5.2 Visual Inspection Field Results and Summary

During the visual inspection of the Project Area, no trees suitable for cultural modification or scarring and no rock outcrops suitable for use as shelters were observed. AHIMS sites #45-3-3445 (stone arrangement) and #45-3-3425 (artefact scatter) were able to be relocated. AHIMS site #45-3-3445 (stone arrangement) was observed to be intact and in good condition, although the origin of this arrangement is considered to be recent as a result of the clearing of sandstone blocks from the existing access track, and as such it will be requested that OEH make this site "not valid". Of the four artefacts recorded at AHIMS site #45-3-3425 (artefact scatter), two were able to be relocated during the visual inspection; these artefacts were not considered to be in their primary context.

AHIMS site #45-3-3424 was not able to be relocated and it is considered highly likely that this site has been entirely destroyed by recent flooding. It has therefore been assessed that it is unlikely that artefacts recorded at this site have been maintained in their recorded context and an ASIR form will be submitted to the Office of Environment and Heritage reflecting this, and requesting that the site be made "not valid".

The Project Area had been disturbed to varying degrees by previous vegetation clearance, vehicle traffic, livestock grazing, and the construction and installation of fences, access tracks, boreholes, and agricultural structures and residential buildings. Large portions of the Project Area were located in areas of swampy floodplain, and were inundated at the time of the visual inspection.

Based on the observed disturbance within the Activity Area, the absence of lithic material suitable for the production of stone tools, and the absence of rock outcrop and trees suitable for cultural modification or scarring, the archaeological potential of the Activity Area has been assessed as low to nil.

6.0 Assessment of Archaeological and Cultural Heritage Values

Consultation with representatives of the local Aboriginal community is a requirement of an Aboriginal AHIA under the Lake Macquarie Aboriginal Heritage Management Strategy (Umwelt 2011: 6.7) (see Appendix 4). The consultation process involved telephone conversations with Bahtabah Local Aboriginal Land Council, Awabakal Descendants Traditional Owners Aboriginal Corporation, Awabakal Traditional Owners Aboriginal Corporation and Guringai Tribal Link to determine whether the Project Area had specific non-archaeological cultural values to the local Aboriginal community.

Representatives of the local Aboriginal community recommended that the Project Area be subject to further archaeological investigation prior to the commencement of works, and also recommended full consultation with the Aboriginal community as part of this investigation. The Project Area is not part of a story site or a traditional pathway. No cultural information was exchanged to indicate that the Project Area had any specific non-archaeological cultural values to the local Aboriginal community.

The full consultation log is located in Appendix 3.

7.0 Impact Assessment

The purpose of an Aboriginal Heritage Impact Assessment under the Management Strategy (Umwelt 2011: 6.7) is to identify whether Aboriginal objects are present, or likely to be present, in the Project Area; to determine whether proposed activities are likely to impact or harm Aboriginal objects (if present) and to determine whether an AHIP is required.

The proposed activity is to prepare the Activity Area for the construction of a proposed WRF. This will involve bulk earthworks within the proposed WRF site, and will include the construction of a new section of access track connecting the existing access track with the proposed WRF site.

The results of the AHIMS search and visual inspection indicated that three registered Aboriginal sites are located in the Project Area. One of these sites has been destroyed by recent flooding (AHIMS site #45-3-3424, artefact scatter), and one is not considered to be Aboriginal in origin (AHIMS site #45-3-3445, stone arrangement); ASIR forms will be submitted to OEH reflecting this, and requesting that the sites be listed as “not valid”. None of the recorded AHIMS sites are located in or within 100 metres of the Activity Area or the proposed section of access track. Based on the observed disturbance within the Project Area, the absence of lithic material suitable for the production of stone tools, and the absence of rock outcrop and trees suitable for cultural modification or scarring, the archaeological potential of the Activity Area has been assessed as low to nil. It has therefore been assessed that there is no identified risk of impact or harm to these sites and an AHIP is not required for the proposed activity.

8.0 Conclusions and Recommendations

This report has considered the available environmental and archaeological information for the Project Area, the land condition, and the nature of the proposed activities. This AHIA has not revealed any evidence to indicate that the proposed activity will have any impact on any identified archaeological sites.

8.1 Management Strategy AHIA Compliance

INFORMATION TO BE PROVIDED IN ASSESSMENT	HOW HAS THIS INFORMATION BEEN PROVIDED IN THIS AHIA?
2. DEVELOPMENT WHICH MAY IMPACT ON ABORIGINAL SITES	
Is an Aboriginal site (objects) known to occur within 100 metres of the proposed development site? What is the nature of Aboriginal archaeological objects/sites that are present on the land: ▪ Site type (e.g. midden, scarred tree, grinding groove); ▪ A description of the site(s) – dimensions, types of artefacts, number of grooves etc; and ▪ Is the visible site within a Potential Archaeological Deposit – if so, what is the extent of this deposit?	No Aboriginal site or objects occur in or within 100 metres of the Activity Area (the proposed development site) or the proposed section of access track to be constructed. The nature of Aboriginal sites/objects within the Project Area has been discussed in **Section 4.0** of this report.
The condition of any Aboriginal archaeological objects/sites. For instance: • What is the substrate (soil or rock) or the site? • Has the ground surface been disturbed and in what way (e.g. erosion type and extent, previous development type and severity)? • Are visible artefacts or shell broken/fragmented/abraded? • Are grinding grooves intact, abraded etc.	The condition of registered AHIMS sites within the Project Area, as observed during the visual inspection, has been discussed in **Section 5.0** of this report.
What is the scientific significance of the archaeological deposit? This depends on the nature of the material and the extent of previous disturbance. It also depends on the archaeological context of the objects/sites – are they rare or common?	The scientific significance of the registered AHIMS sites within the Project Area has been assessed as low to nil.

INFORMATION TO BE PROVIDED IN ASSESSMENT	HOW HAS THIS INFORMATION BEEN PROVIDED IN THIS AHIA?
What are the views of the Aboriginal community about the significance of the objects/sites?	Registered Aboriginal community stakeholder groups were consulted with as part of this AHIA (see **Appendix 3**).
How has the significance of the objects/sites been taken into account in designing the proposed development? • Is it possible to avoid impact? If not, why not? • Can the objects/sites be protected by placing a protective layer of soil/sediment over the top? • Is it appropriate to collect the visible material? • Is further investigation, such as through an archaeological excavation necessary/recommended?	**Registered AHIMS sites within the Project Area will not be impacted by the proposed activity.** **Further investigation is not necessary or recommended for the proposed activity.**

8.2 Conclusions

Investigations under the Lake Macquarie Aboriginal Heritage Management Strategy (Umwelt 2011) and the Due Diligence Code (DECCW 2010) have included the following:

- A search of the Aboriginal Heritage Information Management System (AHIMS) database. This search identified that there were three previously recorded Aboriginal sites in the Project Area; an artefact scatter, an isolated artefact, and a stone arrangement. Of these sites, one is considered to have been destroyed by recent flooding, and one is not considered to be Aboriginal in origin, and ASIR forms will be submitted to OEH reflecting this. None of these sites were located in or within 100 metres of the Activity Area or the proposed new section of access track, and none will be impacted by the proposed activity.
- A consideration of the landforms: land within 200 metres of water, dune systems, ridgetops, headlands, and land immediately above or below cliff faces and/or rockshelters/cave. Land within 200 metres of water was identified in the Project Area.
- A desktop assessment, which included a review of previous archaeological and heritage studies in the vicinity of the Project Area.
- A visual inspection of the Project Area. The previously registered AHIMS sites #45-3-3425 (artefact scatter) and #45-3-3445 (stone arrangement) were able to be relocated; AHIMS #45-3-3445 (stone arrangement) is not considered to be Aboriginal in origin. The previously registered AHIMS site #45-3-3424 (artefact scatter) was not able to be relocated and it is considered to have been destroyed by recent flooding. No other Aboriginal objects or places were identified in the Project Area.

8.3 Recommendations

The following recommendations have been made in relation to the proposed activity, which includes bulk earthworks within the Activity Area and the construction of a new section of access track.

Recommendation 1

There are no Aboriginal sites located in or within 100 metres of the Activity Area or the proposed new section of access track, and therefore an Aboriginal Heritage Impact Permit (AHIP) is not required for the proposed activity.

Recommendation 2

All relevant EG Property Group staff and contractors should be made aware of their statutory obligations for heritage under the *National Parks and Wildlife Act* 1974 and the *Heritage Act* 1977, which may be implemented as a heritage induction. As part of this induction, all staff and contractors should be made aware of the location the registered AHIMS sites that are located within the Project Area.

Recommendation 3

This due diligence assessment must be kept by EG Property Group so that it can be presented, if needed, as a defence from prosecution under Section 86(2) of the *National Parks and Wildlife Act* 1974.

Recommendation 4

If unrecorded Aboriginal object/s are identified in the Project Area during works, then all works in the immediate area must cease and the area should be cordoned off. OEH must be notified by ringing the Enviroline 131 555 so that the site can be adequately assessed and managed.

Recommendation 5

In the unlikely event that skeletal remains are identified, work must cease immediately in the vicinity of the remains and the area must be cordoned off. The proponent must contact the local NSW Police who will make an initial assessment as to whether the remains are part of a crime scene or possible Aboriginal remains. If the remains are thought to be Aboriginal, OEH must be contacted by ringing the Enviroline 131 555. An OEH officer will determine if the remains are Aboriginal or not; and a management plan must be developed in consultation with the relevant Aboriginal stakeholders before works recommence.

Recommendation 6

If, during the course of development works, suspected historic cultural heritage material is uncovered, work should cease in that area immediately. The Heritage Branch, Office of Environment & Heritage (Enviroline 131 555) should be notified and works only recommence when an approved management strategy has been developed.

9.0 References

Attenbrow, V. (2003). *Sydney's Aboriginal Past: Investigating the Archaeological and Historical Records*, UNSW Press.

DECCW (2010). Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales. *Part 6 National Parks and Wildlife Act 1974*. G. S.

Doelman, T., R. Torrence, et al. (2008). "Source selectivity: An assessment of Volcanic Glass Sources in the Southern Primorye Region, Far East Russia." *Geoarchaeology: An International Journal* **23**: 243-273.

Keith, D. (2006). *Ocean Shores to Desert Dunes: The Native Vegetation of New South Wales and the ACT*. Sydney, Department of Environment and Conservation NSW.

Nash, D. (2004). Aboriginal Plant Use in South-Eastern Australia. Australian National Botanic Gardens.

DECCW. 2010. "Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales." in *Part 6 National Parks and Wildlife Act 1974*, edited by Department of Environment Climate Change & Water.

Insite Heritage. 2010. *Aboriginal and European Heritage Assessment, Wyee - Local Environmental Study.* Report to Conics Pty Ltd.

Keith, D. 2006. *Ocean Shores to Desert Dunes: The Native Vegetation of New South Wales and the ACT*. Sydney: Department of Environment and Conservation NSW.

Land and Property Information. (2013). "SIX Maps." Retrieved 4 July 2013, from http://maps.six.nsw.gov.au/.

Lake Macquarie City Council. 2013. *Lake Macquarie Local Environmental Plan 2004 (Amendment to No 61).* Published on NSW Legislation Website on 24/5/2013.

Murphy, C.L. 1993. *Soil Landscapes of the Gosford-Lake Macquarie 1:100 000 Sheet*. Sydney: Department of Conservation and Land Management.

RPS. 2011. *Cultural Heritage Report - Wyee Point Reserve.* Report prepared for Lake Macquarie City Council.

Streat Archaeological Services. 2013. *Proposed Wastewater Management Plant at part of Lot 17 DP 870597, Hue Hue Road, Wyee, New South Wales: Due Diligence Aboriginal Archaeological Assessment.* Prepared for EG Property Pty Ltd.

Umwelt. 2011. *Sustainable Management of Aboriginal Cultural Heritage in the Lake Macquarie Local Government Area: Lake Maquarie Aboriginal Heritage Management Strategy.* Prepared by Umwelt (Australia) Pty Ltd on behalf of Lake Macquarie City Council.

10.0 Plates

Plate 1: View of the Project Area from Bushells Ridge Road, facing north. RPS 2013

Plate 2: Example of disturbance in the Project Area. RPS 2013

Plate 3: Example of disturbance in the Project Area. RPS 2013

Plate 4: Example of disturbance in the Project Area. RPS 2013

Plate 5: Example of disturbance in the Project Area. RPS 2013

Plate 6: Water inundation in the Project Area. RPS 2013

Plate 7: Mannering Creek, facing west. RPS 2013

Plate 8: View of unnamed drainage line, facing east. RPS 2013

Plate 9: Example of vegetation along Mannering Creek. RPS 2013

Plate 10: Example of vegetation in the Project Area. RPS 2013

Plate 11: Ground surface visibility in the Project Area. RPS 2013

Plate 12: Example of ground surface exposure in the Project Area. RPS 2013

Plate 13: Recorded location of AHIMS site #45-3-3424. RPS 2013

Plate 14: Relocated artefacts at AHIMS site #45-3-3425. RPS 2013

Plate 15: Recorded location of AHIMS site #45-3-3425. RPS 2013

Plate 16: Stacked sandstone blocks at AHIMS site #45-3-3445. RPS 2013

Plate 17: View of the Activity Area, facing northeast. RPS 2013

Appendix 1

Legislative Requirements

Summary of Statutory Controls

The following overview of the legal framework is provided solely for information purposes for the client, it should not be interpreted as legal advice. RPS will not be liable for any actions taken by any person, body or group as a result of this general overview, and recommend that specific legal advice be obtained from a qualified legal practitioner prior to any action being taken as a result of the summary below.

COMMONWEALTH

Aboriginal & Torres Strait Islander Heritage Protection Act 1984 (ATSIHIP Act)

The purpose of this Act is to preserve and protect all heritage places of particular significance to Aboriginal and Torres Strait Islander people. This Act applies to all sites and objects across Australia and in Australian waters (s4).

It would appear that the intention of this Act is to provide national baseline protection for Aboriginal places and objects where State legislation is absent. It is not to exclude or limit State laws (s7(1)). Should State legislation cover a matter already covered in the Commonwealth legislation, and a person contravenes that matter, that person may be prosecuted under either Act, but not both (s7(3)).

The Act provides for the preservation and protection of all Aboriginal objects and places from injury and/or desecration. A place is construed to be injured or desecrated if it is not treated consistently with the manner of Aboriginal tradition or is or likely to be adversely affected (s3).

Australian Heritage Commission Act 1975

The *Australian Heritage Commission Act (1975)* established the Australian Heritage Commission which assesses places to be included in the National Estate and maintains a register of those places. Places maintained in the register are those which are significant in terms of their association with particular community or social groups and they may be included for social, cultural or spiritual reasons. The Act does not include specific protective clauses.

The *Australian Heritage Council Act 2003,* together with the *Environment Protection & Biodiversity Conservation Act 1999,* includes a National Heritage List of places of National heritage significance, maintains a Commonwealth Heritage List of heritage places owned or managed by the Commonwealth and ongoing management of the Register of the National Estate.

STATE

It is incumbent on any land manager to adhere to state legislative requirements that protect Aboriginal Cultural heritage. The relevant legislation is NSW includes but is not limited to the summary below.

National Parks and Wildlife Act 1974 (NPW Act)

The NPW Act provides statutory protection for all Aboriginal heritage, places and objects (not being a handicraft made for sale), with penalties levied for breaches of the Act. This legislation is overseen by the Office of Environment and Heritage (OEH), and specifically the Chief Executive (formerly the Director-General) of OEH. Part 6 of this Act is the relevant part concerned with Aboriginal objects and places, with Section 86 and Section 90 being the most pertinent. In 2010, this Act was substantially amended, particularly with respect to Aboriginal cultural heritage requirements. Relevant sections include:

Section 86

This section now lists four major offences:

(4) A person must not harm an object that the person knows is an Aboriginal object;

(5) A person must not harm and Aboriginal object;

(6) For the purposes of s86, "circumstances of aggravation" include:

  (a) The offence being committed during the course of a commercial activity; or

  (b) That the offence was the second or subsequent offence committed by the person;

(7) A person must not harm or desecrate an Aboriginal place.

Offences under s86 (2) and (4) are now strict liability offences, i.e., knowledge that the object or place harmed was an Aboriginal object or place needs to be proven. Penalties for all offences under Part 6 of this Act have also been substantially increased, depending on the nature and severity of the offence.

Section 87

This section now provides defences to the offences of s86. These offences chiefly consist of having an appropriate Aboriginal Heritage Impact Permit (AHIP), not contravening the conditions of the AHIP or demonstrating that due diligence was exercised prior to the alleged offence.

Section 87A & 87B

These sections provide exemptions from the operation of s86; Section 87A for authorities such as the Rural Fire Service, State Emergency Services and officers of the National Parks & Wildlife Service in the performance of their duties, and s87B for Aboriginal people performing traditional activities.

Section 89A

If a person knows of the location of an Aboriginal object or place that has not been previously registered and does not advise the Director-General (now Chief Executive) of that object or place within a reasonable period of time, then that person is guilty of an offence under this Section of the Act.

Section 90

This section authorises the Director-General (now Chief Executive) to issue and AHIP.

Section 90A-90R

These sections govern the requirements relating to applying for an AHIP. In addition to the amendments to the Act, OEH have issued three new policy documents clarifying OEH's requirements with regards to Aboriginal archaeological investigations: *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010, Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW and Code of Practice for Archaeological Investigations in NSW*. The Consultation Requirements formalise the consultation with Aboriginal community groups into four main stages, and includes details regarding the parties required to be consulted, advertisements inviting Aboriginal community groups to participate in the consultation process, requirements regarding the provision of methodologies, draft and final reports to the Aboriginal stakeholders and timetables for the four stages. The Due Diligence Code of Practice sets out the minimum requirements for investigation, with particular regard as to whether an AHIP is required. The Code of Practice for Archaeological Investigation sets out the minimum requirements for archaeological investigation of Aboriginal sites.

Aboriginal Heritage Impact Permits (AHIP)

OEH encourages consultation with relevant Aboriginal stakeholders for all Aboriginal Heritage Assessments. However, if an Aboriginal Heritage Impact Permit (AHIP) is required for an Aboriginal site, then specific OEH guidelines are triggered for Aboriginal consultation.

Aboriginal Cultural Heritage Consultation Requirements for Proponents

In 2010, the Aboriginal Cultural Heritage Consultation Requirements for Proponents (ACHCRs) were issued by OEH (12 April 2010). These consultation requirements replace the previously issued Interim Community Consultation Requirements (ICCR) for Applicants (Dec 2004). These guidelines apply to all AHIP applications prepared after 12th April 2010; for projects commenced prior to 12th April 2010, transitional arrangements have been stipulated in a supporting document, Questions and Answers 2: Transitional Arrangements.

The ACHCRs 2010 include a four stage Aboriginal consultation process and stipulate specific timeframes for each state. Stage 1 requires that Aboriginal people who hold cultural information are identified, notified and invited to register an expression of interest in the assessment. Stage 1 includes the identification of Aboriginal people who may have an interest in the project area and hold information relevant to determining the cultural significance of Aboriginal objects or places. This identification process should draw on reasonable sources of information including: the relevant OEH EPRG regional office, the relevant Local Aboriginal Land Council(s), the Registrar of Aboriginal Owners, Aboriginal Land Rights Act (1983), the Native Title Tribunal, Native Title Services Corporation Limited, the relevant local council(s), and the relevant catchment management authority. The identification process should also include an advertisement placed in a local newspaper circulating in the general location of the project area. Aboriginal organisations and/or individuals identified should be notified of the project and invited to register an expression of inters (EoI) for Aboriginal consultation. Once a list of Aboriginal stakeholders has been compiled from the EoI's, they need to be consulted in accordance with ACHCR's Stages 2, 3 and 4.

Environmental Planning & Assessment Act 1979 (EP&A Act)

This Act regulates a system of environmental planning and assessment for New South Wales. Land use planning requires that environmental impacts are considered, including the impact on cultural heritage and specifically Aboriginal heritage. Within the EP&A Act, Parts 3, 4 and 5 relate to Aboriginal heritage.

Part 3 regulates the preparation of planning policies and plans. Part 4 governs the manner in which consent authorities determine development applications and outlines those that require an environmental impact statement. Part 5 regulates government agencies that act as determining authorities for activities conducted by that agency or by authority from the agency. The National Parks & Wildlife Service is a Part 5 authority under the EP&A Act.

In brief, the NPW Act provides protection for Aboriginal objects or places, while the EP&A Act ensures that Aboriginal cultural heritage is properly assessed in land use planning and development.

Heritage Act 1977

This Act protects the natural and cultural history of NSW with emphasis on non-indigenous cultural heritage through protection provisions and the establishment of a Heritage Council. Although Aboriginal heritage sites and objects are primarily protected by the *National Parks & Wildlife Act* 1974, if an Aboriginal site, object or place is of great significance, it may be protected by a heritage order issued by the Minister subject to advice by the Heritage Council.

Other legislation of relevance to Aboriginal cultural heritage in NSW includes the *NSW Local Government Act* 1993. Local planning instruments also contain provisions relating to indigenous heritage and development conditions of consent.

Appendix 2

AHIMS

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref Number : 118450

Client Service ID : 104012

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
45-3-1311	Pasadena;	AGD	56	356972	6326822	Open site	Valid	Artefact : -	Open Camp Site	100541,100863,101093
	Contact	**Recorders**	Unknown Author					**Permits**		
45-3-3180	B14	AGD	56	359150	6325075	Open site	Valid	Artefact : -		100541,100863,101093
	Contact	**Recorders**	Michael Therin					**Permits**		
45-3-3176	B;1	AGD	56	359750	6324715	Open site	Valid	Artefact : -		100541,100863,101093
	Contact	**Recorders**	Michael Therin					**Permits**		
45-3-3179	B11	AGD	56	359563	6325450	Open site	Valid	Artefact : -		100541,100863,101093
	Contact	**Recorders**	Therin Archaeological Consulting					**Permits**		
45-3-3186	BR10	AGD	56	359612	6326462	Open site	Valid	Artefact : -		100541,100863,101093
	Contact	**Recorders**	Michael Therin					**Permits**		
45-3-3187	BR13	AGD	56	359375	6325050	Open site	Valid	Artefact : -		100541,100863,101093
	Contact	**Recorders**	Michael Therin					**Permits**		
45-3-3188	BR12	AGD	56	359427	6325219	Open site	Valid	Artefact : -		100541,100863,101093
	Contact	**Recorders**	Michael Therin					**Permits**		
45-3-3259	B7	GDA	56	360227	6325388	Open site	Valid	Artefact : 1		
	Contact T Russell	**Recorders**	Michael Therin					**Permits**		
45-3-3260	B3, Bushells Ridge	AGD	56	360187	6325275	Open site	Valid	Artefact : 1		
	Contact T Russell	**Recorders**	Michael Therin					**Permits**		
45-3-3261	B9, Bushells Ridge	AGD	56	359601	6326537	Open site	Valid	Artefact : 2		
	Contact T Russell	**Recorders**	Michael Therin					**Permits**		
45-3-3262	B4, Bushells Ridge	GDA	56	360008	6325262	Open site	Valid	Artefact : 1		
	Contact T Russell	**Recorders**	Michael Therin					**Permits**		
45-3-3263	B8, Bushells Ridge	GDA	56	359931	6325584	Open site	Valid	Artefact : 1		
	Contact T Russell	**Recorders**	Michael Therin					**Permits**		
45-3-3335	PAD 4 - Munmorah (not a PAD)	AGD	56	357900	6326000	Open site	Not a Site	Potential Archaeological Deposit (PAD) : -		100751,100944
	Contact	**Recorders**	Heritage Concepts,Jakub Czastka					**Permits**	2780,2781	
45-3-3424	Mannering Creek 1	GDA	56	357799	6327519	Open site	Valid	Artefact : 2		101909
	Contact	**Recorders**	Mrs.Angela Besant					**Permits**		
45-3-3425	Mannering Creek 2	GDA	56	358331	6327766	Open site	Valid	Artefact : 1		101909

Report generated by AHIMS Web Service on 21/06/2013 for Karyn Virgin for the following area at Lat, Long From : -33.2076, 151.4521 - Lat, Long To : -33.1634, 151.5065 with a Buffer of 0 meters. Additional Info : HIA. Number of Aboriginal sites and Aboriginal objects found is 16

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref Number : 118450

Client Service ID : 104012

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
	Contact	**Recorders**	Mrs.Angela Besant					**Permits**		
45-3-3445	Wyee 3	GDA	56	358290	6326655	Open site	Valid	Stone Arrangement : -		
	Contact Mr.Shane Frost	**Recorders**	Insite Heritage Pty Ltd,Ms.Elizabeth Wyatt					**Permits**		

Report generated by AHIMS Web Service on 21/06/2013 for Karyn Virgin for the following area at Lat, Long From : -33.2076, 151.4521 - Lat, Long To : -33.1634, 151.5065 with a Buffer of 0 meters. Additional Info : HIA. Number of Aboriginal sites and Aboriginal objects found is 16

Appendix 3

Aboriginal Consultation Log

Date	Organisation	Details
8 July 2013	Bahtabah Local Aboriginal Land Council (LALC)	Karyn Virgin (KV) sent email to Bahtabah LALC regarding the non-archaeological cultural values of the Project Area.
8 July 2013	Awabakal Descendants Traditional Owners Aboriginal Corporation (ADTOAC)	KV sent email to ADTOAC regarding the non-archaeological cultural values of the Project Area.
8 July 2013	Awabakal Traditional Owners Aboriginal Corporation (ATOAC)	KV sent email to ATOAC regarding the non-archaeological cultural values of the Project Area.
8 July 2013	Bahtabah LALC	KV phoned Bahtabah LALC regarding the non-archaeological cultural values of the Project Area. There was no answer; KV left a message.
8 July 2013	ADTOAC	KV phoned ADTOAC regarding the non-archaeological cultural values of the Project Area. There was no answer; KV left a message.
8 July 2013	ATOAC	KV phoned ATOAC regarding the non-archaeological cultural values of the Project Area. There was no answer; KV left a message.
8 July 2013	ADTOAC	KV received phone call from Shane Frost. Discussed the Project Area, including the results of previous surveys. Shane did not identify any non-archaeological cultural values in association with the Project Area. Shane requested that a map of the area be sent with further information regarding the proposed activity. Shane also suggested that KV contact Tracey Howie of GTL, as she was present at previous surveys and has cultural knowledge of the area.
9 July 2013	Bahtabah LALC	KV sent email to Bahtabah LALC regarding the non-archaeological cultural values of the Project Area.
9 July 2013	ADTOAC	KV sent email to ADTOAC regarding the non-archaeological cultural values of the Project Area.
9 July 2013	ATOAC	KV sent email to ATOAC regarding the non-archaeological cultural values of the Project Area.
9 July 2013	Guringai Tribal Link (GTL)	KV sent email to GTL regarding the non-archaeological cultural values of the Project Area.
10 July 2013	Bahtabah LALC	KV phoned Bahtabah LALC regarding the non-archaeological cultural values of the Project Area. Bahtabah LALC confirmed that KV's email was received, and they would get back to her as soon as possible.
10 July 2013	ADTOAC	KV phoned ADTOAC regarding the non-archaeological cultural values of the Project Area. There was no answer; KV left a message.
10 July 2013	ATOAC	KV phoned ATOAC regarding the non-archaeological cultural values of the Project Area and spoke to Kerrie Brauer. Kerrie advised that she had been busy, but would respond to KV's email as soon as possible.
10 July 2013	GTL	KV phoned GTL regarding the non-archaeological cultural values of the Project Area and spoke to Tracey Howie. Tracey did not identify any non-archaeological cultural values in association with the Project Area.
10 July 2013	ATOAC	KV received an email from Kerrie Brauer thanking her for her follow-up phone call, and advising that she would respond to KV the following week.
11 July 2013	ATOAC	KV received an email from Kerrie Brauer asking whether or not RPS had taken the Project over from Ben Streat. KV advised Kerrie that B. Streat had prepared a Due Diligence assessment, while RPS were preparing an Aboriginal Heritage Impact Assessment at Council's request.
16 July 2013	ATOAC	KV received an email from Kerrie Brauer (with ADTOAC, GTL and Amanda@awabakal.com.au cc'd in) expressing concerns about the project, and asking when the AHIA would take place.
16 July 2013	ATOAC	KV and Erin Williams (EW) called Kerrie Brauer in response to her email and discussed the project. Ascertained that the Aboriginal community were confused as to the heritage works being undertaken

Date	Organisation	Details
		for the property. EW and KV advised that they would seek clarification on this issue with the client.
16 July 2013	ATOAC	KV emailed Kerrie Brauer (with ADTOAC, GTL and Amanda@awabakal.com.au cc'd in) advising them that the RPS were discussing the project with EG Property, and would let her and other stakeholders know the outcome of these discussions as soon as possible.
16 July 2013	GTL	KV received an email from Tracey Howie (with ADTOAC and ATOAC cc'd in) expressing concerns about the project, and advising that all land and waters within Guringai/Awabakal country is considered to be culturally and spiritually significant to their People and ancestors.
17 July 2013	ATOAC	KV and EW called Kerrie Brauer to inform her that Ben Streat was no longer working on the project, and to explain the heritage work that RPS were doing (AHIA). Kerrie expressed concern over project, and stated that the Aboriginal stakeholders believed that test excavation and full ACHCRs should be done prior to the proposed works commencing. EW asked Kerrie if she would like to be involved in conducting the heritage induction for the construction works once they commence; Kerrie said that that could be discussed at a later time. Kerrie was very clear in stating that she recommended further investigation of the area and a full process ACHCRs.

Appendix 4

Information Required in AHIA (Umwelt 2011: 6.6-6.7)

INFORMATION TO BE PROVIDED IN ASSESSMENT	HOW THIS INFORMATION CAN BE OBTAINED
2. DEVELOPMENT WHICH MAY IMPACT ON ABORIGINAL SITES	
Is an Aboriginal site (objects) known to occur within 100 metres of the proposed development site? What is the nature of Aboriginal archaeological objects/sites that are present on the land: ▪ Site type (e.g. midden, scarred tree, grinding groove); ▪ A description of the site(s) – dimensions, types of artefacts, number of grooves etc; and ▪ Is the visible site within a Potential Archaeological Deposit – if so, what is the extent of this deposit?	Check the information on the s149 Certificate for the property. Seek advice from OEH (on line AHIMS) or LMCC as to whether a known Aboriginal site may be affected by the proposed development (Council cannot currently provide this advice but preliminary advice about the presence of an Aboriginal site may be available from Council in the future). Obtain a site register search from OEH. Searches are free of charge on-line. However, if a property is affected a fee is charges for further information. Where a site is present (or is likely to be present) on the land and may be affected by the proposed development, you should also obtain a copy of the Site Card from OEH and copies of any previous assessment reports should be reviewed. Where the site is likely to be within the proposed development area, you should arrange for a site inspection to be conducted by a qualified archaeologist. When the site is likely to be impacted by the proposed development are, you must also show evidence that you have consulted with the local Aboriginal community, in accordance with the OWH Aboriginal Cultural Heritage Consultation Requirements for Proponents
The condition of any Aboriginal archaeological objects/sites. For instance: • What is the substrate (soil or rock) or the site? • Has the ground surface been disturbed and in what way (e.g. erosion type and extent, previous development type and severity)? • Are visible artefacts or shell broken/fragmented/abraded? • Are grinding grooves intact, abraded etc.	The OEH document 'Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW' sets out the requirements for archaeological reports. As above, this information is obtained from a survey of the site by a qualified archaeologist. Where archaeological material is visible on the surface, you should provide photographs of the material in its context. A sketch plan showing the extent of Aboriginal archaeological material (including Potential Archaeological Deposits) in relation to the footprint

INFORMATION TO BE PROVIDED IN ASSESSMENT	HOW THIS INFORMATION CAN BE OBTAINED
	of the proposed development should be provided.
What is the scientific significance of the archaeological deposit? This depends on the nature of the material and the extent of previous disturbance. It also depends on the archaeological context of the objects/sites – are they rare or common?	This information is provided by a qualified archaeologist. The archaeologist will apply the criteria listed in the OEH 2010 and 2011 codes and guidelines A cultural significance assessment is also required (see below).
What are the views of the Aboriginal community about the significance of the objects/sites?	Either the proponent or the archaeological consultant must consult with the Aboriginal community. The OEH Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010 set out specific requirements for who must be consulted and how, when advice is needed about the Aboriginal significance of a known site.
How has the significance of the objects/sites been taken into account in designing the proposed development? • Is it possible to avoid impact? If not, why not? • Can the objects/sites be protected by placing a protective layer of soil/sediment over the top? • Is it appropriate to collect the visible material? • Is further investigation, such as through an archaeological excavation necessary/recommended?	Provide information about how impacts on the site will be avoided wherever possible. For instance, will the Aboriginal site be fenced during construction? Will construction workers be advised about the sensitive area? Will the site be covered and how? These matters should be discussed with relevant Aboriginal stakeholders. Note that if the site will be disturbed in any way – by collecting archaeological material or by excavation, or movement of machinery across the site, you will need to obtain a section 90 (Aboriginal Heritage Impact Permit - AHIP) from OEH before work commences. Excavation for the purpose of obtaining additional information about an Aboriginal archaeological deposit must not be conducted until a section 87 permit (s87 AHIP) has been obtained from OEH.

2013 No 229

New South Wales

Lake Macquarie Local Environmental Plan 2004 (Amendment No 61)

under the

Environmental Planning and Assessment Act 1979

I, the Minister for Planning and Infrastructure, make the following local environmental plan under the *Environmental Planning and Assessment Act 1979*.

RICHARD PEARSON
As delegate for the Minister for Planning and Infrastructure

Lake Macquarie Local Environmental Plan 2004 (Amendment No 61)

under the

Environmental Planning and Assessment Act 1979

1 Name of Plan

This Plan is *Lake Macquarie Local Environmental Plan 2004 (Amendment No 61)*.

2 Commencement

This Plan commences on the day on which it is published on the NSW legislation website.

3 Land to which Plan applies

This Plan applies to land in the vicinity of Bushells Ridge, Gorokan and Hue Hue Roads at Wyee, being:

(a) Lots 16 and 17, DP 870597, and

(b) Lot 1, DP 785709, and

(c) Lot 1, DP 244839, and

(d) Lot 212, DP 866437, and

(e) Lot 215, 860081, and

(f) Lot 210, DP 846801, and

(g) Lot 1, DP 103857, and

(h) Lot 8, Section 10, DP 759124, and

(i) Lots 202–400, DP 7506, and

(j) Lot 185, DP 650204, and

(k) Lot 9, DP 1058113, and

(l) Lots 186–189, 323, 324, 428–431, 441–443, 472 and 473, DP 755242, and

(m) Lot 1582, DP 1121660,

as shown edged heavy black on the map marked "Lake Macquarie Local Environmental Plan 2004 (Amendment No 61)" deposited in the office of Lake Macquarie City Council.

Schedule 1 Amendment of Lake Macquarie Local Environmental Plan 2004

[1] Clause 42B

Insert after clause 42A:

42B Environmentally sensitive land

(1) The objectives of this clause are as follows:

(a) to ensure that adverse impacts of proposed development on environmentally sensitive land are minimised or offset,

(b) to identify the land to which this clause applies as environmentally sensitive land.

(2) This clause applies to the land shown edged heavy black on Sheet 2 of the map marked "Lake Macquarie Local Environmental Plan 2004 (Amendment No 61)".

(3) When assessing a development application for development on land to which this clause applies, the Council must consider:

(a) whether the proposed development will have an adverse impact on the condition and significance of the vegetation on the land, and

(b) the importance of that vegetation to the growth and survival of native fauna, and

(c) whether the proposed development has the potential to fragment, disturb or diminish the biodiversity values of the land.

(4) Before granting development consent to development on land to which this clause applies, the Council must be satisfied that:

(a) the development is sited, designed and managed to avoid potential adverse environmental impacts, or

(b) if an impact cannot be avoided by adopting feasible alternatives, the proposed development will mitigate, minimise or offset that impact.

[2] Clause 62 Public infrastructure in urban release areas

Insert in appropriate order in the definition of ***urban release area*** in clause 62 (8):

Lake Macquarie Local Environmental Plan 2004 (Amendment No 61)—Sheet 3

[3] Schedule 3 Classification and reclassification of public land as operational land

Insert at the end of the table to Part 2 in Columns 1, 2 and 3, respectively:

16a Tullokan Road	Lot 430, DP 755242	Nil.

[4] Schedule 8 Land subject to special development requirements

Insert at the end of the table to the Schedule under the headings Item No, Column 1 and Column 2, respectively:

11	Land at Wyee, being land in the vicinity of Bushells Ridge, Gorokan and Hue Hue Roads, as shown edged heavy black and lettered "2 (1)", "2 (2)", "5", "6 (1)", "7 (1)", "7 (3)" or "7 (5)" on Sheet 1 of the map marked "Lake Macquarie Local Environmental Plan 2004 (Amendment No 61)".	A development control plan for the land must have been approved by the Council before development consent is granted for any development. The provisions of the development control plan are to include, but are not limited to, the following matters: (a) a staging plan for the timely and efficient release of urban land-making provision for necessary infrastructure and sequencing, (b) an overall transport movement hierarchy showing the major circulation routes and connections to achieve a simple and safe movement system for private vehicles, public transport, pedestrians and cyclists, (c) an overall landscaping strategy for the protection and enhancement of riparian areas and remnant vegetation, including visually prominent locations, and detailed landscaping requirements for both the public and private domain, (d) a network of passive and active recreational areas,

(e) stormwater and water quality management controls,

(f) amelioration of natural and environmental hazards, including bushfire, flooding and site contamination and, in relation to natural hazards, the safe occupation of, and the evacuation from, any land so affected,

(g) detailed urban design controls for significant development sites,

(h) measures to encourage higher density living around transport, open space and service nodes,

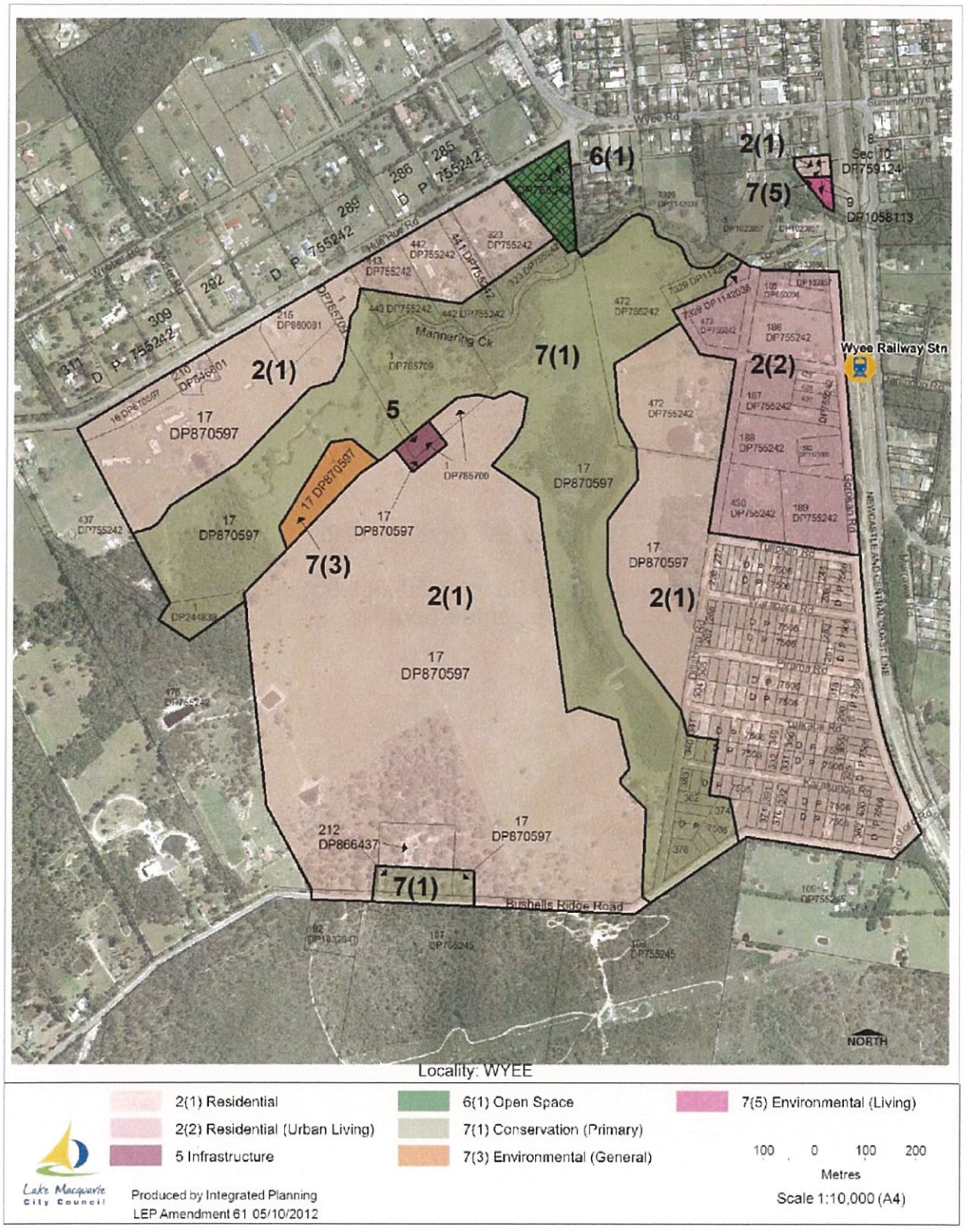
(i) measures to accommodate and control appropriate neighbourhood commercial and retail uses,

(j) suitably located public facilities and services, including provisions for appropriate traffic management facilities and parking.

[5] Dictionary

Insert in appropriate order in the definition of ***the map***:

Lake Macquarie Local Environmental Plan 2004 (Amendment No 61)—Sheet 1


6(1)
2(1)
7(5)
Sec 10 DP759124
9 DP1058113
Wyee Rd
Summerhayes
Mannering Ck
7(1)
2(1)
5
17 DP870597
2(2)
Wyee Railway Stn
7(3)
2(1)
2(1)
212 DP866437
7(1)
Bushells Ridge Road
NEWCASTLE AND CENTRAL COAST LINE
NORTH
Locality: WYEE
2(1) Residential
2(2) Residential (Urban Living)
5 Infrastructure
6(1) Open Space
7(1) Conservation (Primary)
7(3) Environmental (General)
7(5) Environmental (Living)
100 0 100 200
Metres
Scale 1:10,000 (A4)
Lake Macquarie City Council
Produced by Integrated Planning
LEP Amendment 61 05/10/2012

Wyee Local Environmental Study

Volume 1

15 October 2010

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Version	Purpose of Document	Orig	Review	Review Date	Format Review	Approval	Issue Date
Rev A	Draft to Client	B Lewis	A Davidson	16 July 2010	K Miers	B Lewis	16 July 2010
Rev 0	Final for Submission	B Lewis	A Davidson	15 Oct 2010	K Miers	B Lewis	15 Oct 2010

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Volume 3 – Appendices

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Executive Summary

This local environmental study (LES) has been prepared to assess a potential rezoning of land within Wyee in Lake Macquarie. Wyee township is located immediately north of the southern boundary of Lake Macquarie City and Wyong Shire, approximately 9km south of Morisset. The town is located on the main northern rail line, to the east of the Sydney-Newcastle (F3) Freeway.

The subject site is bounded by Hue Hue Road to the north and Bushells Ridge Road to the south. It has a total area of approximately 153ha and includes an existing paper subdivision comprising approximately 200 lots. The LES includes the following detailed investigations (refer to Volumes 2 and 3):

- Biodiversity Study
- Geotechnical & Contamination
- Aboriginal And European Heritage
- Water Management
- Bushfire
- Visual Impact
- Traffic And Transport
- Infrastructure
- Social Impact
- Economic Analysis

This LES demonstrates that the site has environmental constraints which need to be managed in an appropriate manner. Consideration was afforded to the environmental, economic and social impacts of rezoning the site for urban development to ensure a balanced outcome was achieved. Some further investigations are likely to be required prior to development and it is recommended that a detailed master planning exercise be undertaken prior to the development of the site.

The preferred zoning comprises a combination of residential, conservation, environmental living and open space zones.

1 Introduction

1.1 Background

On 7 November 2007, Lake Macquarie City Council received a rezoning proposal from Macroplan Australia on behalf of Wyee Development Fund Pty Ltd for land immediately west of the Wyee Township (Figure 2-2 Area A"). The site is currently zoned for agriculture and environmental conservation and the proposal involved the rezoning of the land for various urban and conservation purposes.

Council's Rezoning Appraisal and Prioritisation (RAP) team considered the proposal on 21 November 2007. They concluded that the proposal had merit and advised that the rezoning application should also consider land at Wyee West (which includes a "paper subdivision"), as well as the provision of infrastructure to the area ("Area B"). The overall site is illustrated in Figure 2-2.

The Lower Hunter Regional Strategy identifies Wyee as a land release area with the potential to supply an additional 2000 dwellings by 2031. In response, Council have commenced preparation of the Wyee Structure Plan which has received funding assistance from the Department of Planning (DoP). To inform this plan, Council have undertaken a strategic overview of the Wyee locality and have prepared the Draft Wyee Structure Plan Background Report. These are due to be finalised in 2010.

On 29 January 2008, Council resolved to prepare a draft amendment to the Lake Macquarie Local Environmental Plan 2004 (LMLEP2004) for both Areas A and B ("the site") to appropriate zones to support urban land use, open space and conservation zones. The Department of Planning (DoP) did not issue an Authorisation but required Council to comply with Sections 57 and 61 of the *Environmental Planning and Assessment Act 1979* (EP&A Act)[1]. Specifications for a Local Environmental Study (LES) were issued by DoP, a copy of which is provided in **Appendix 1**. Council subsequently undertook consultation with relevant state government agencies, the responses of whom are provided within **Appendix 2**.

This LES has been prepared in accordance with section 57 of the EP&A Act.

[1] On 1 July 2009 a number of changes were made to the EP&A Act in relation to rezonings and amendments to LEPs. Prior to 1 July 2009, rezonings in NSW fell under Part 3 Division 4 of the EP&A Act. This represented Clauses 53 to 70 of the Act. From 1 July 2009 rezonings still fall under Part 3 Division 4 but this Division is now defined by Clauses 53-60. Although the legislation may have changes, savings and transitional provisions were gazetted that enabled LEPs currently in preparation to still process under the provisions of the EP&A Act prior to 1 July 2009. This situation applies to the subject site. References to clauses 53 to 70 in this section refer to the EP&A prior to 1 July 2009.

1.2 Objectives of the LES

The primary objective of the LES is to:

Identify existing biophysical and socio-cultural features of the study area, assess the suitability of the study area to support a mixture of urban development and conservation uses and identify the appropriate zones for the subject site.

1.3 Scope of Environmental Study

The LES undertakes the following tasks:

1. Review statutory and strategic planning instruments that regulate or guide urban development and conservation for the site;
2. Identifies biophysical features and potential impacts from the proposed urban development of the land;
3. identifies socio-cultural features and potential impacts from the proposed development of the land;
4. Investigates the suitability of the study area to support urban development including residential, industrial and commercial uses as well as conservation areas; and
5. Provides a justification of the LES findings and clear recommendations on the appropriate zoning of the land to facilitate urban development and conservation.

1.4 State Agency Requirements

Council has undertaken consultation with relevant state government agencies in accordance with Section 62 (now repealed) of the EP&A Act. Several agencies provided correspondence on various issues, including identification of specific requirements to be addressed in the LES investigations. Table 1-1 details the issues raised in the consultation. **Appendix 2** provides copies of the responses.

Table 1-1: Section 62 Responses

AGENCY	ISSUE
DEPARTMENT OF ENVIRONMENT & CLIMATE CHANGE (Now Department of Environment Climate Change & Water	Mindful of the need to maintain important sub regional corridors through the subject site from the regional corridor to the south (in Wyong Council)
	Existing conservation zones on site – these corridors should be maintained and enhanced
	Impacts on areas of native vegetation, with special reference to threatened or regionally significant flora and fauna species, populations and ecological communities. Where impacts are proposed on areas of biodiversity value, the proponent should clearly demonstrate how they proposed to offset any loss in biodiversity value to meet the 'improve or maintain' threshold.

AGENCY	ISSUE
	Any potential landuse conflicts associated with air, noise and odour impacts are adequately addressed, particularly in relation to premises scheduled under the POEO Act 1997.
	Proposed LEP adequately considered the relevant threatened species provisions of the EP&A Act 1979, SEPP 44 and SEPP 71, and the Native Vegetation Act.
	An appropriate level of Aboriginal cultural heritage assessment has been undertaken, and the proposed LEP is not likely to impact on areas of cultural significance to the Aboriginal community. Also it important that the view of the Aboriginal community groups be sought and fully considered in regard to the preparation of the LEP.
	Potential and direct impacts on DECC estate, wilderness areas, wild rivers and recognised areas of high conservation value have been adequately considered and avoided, ameliorated or compensated as appropriate.
	Any areas of contamination of the site are identified and managed in accordance with the CLM Act 1997
	Stormwater emanating from the area must be managed in a sustainable manner to prevent any impacts on the adjacent rivers, wetlands or estuaries.
	If proposed LEP affects any species listed under the EPBC Act, then consultation may be required with the Australian Government Department of the Environment, Water, Heritage and the Arts.
	Refer also to DECC guidelines for preparing LEPs
DEPARTMENT OF EDUCATION & TRAINING	Future (overall) development in Wyee, especially in the future residential development of Areas A and B is anticipated to require additional land for a new primary school in this instance.
	The LES will consider appropriate land use zones to facilitate identification of a 3ha government primary school site.
	Refer also requirements for new school sites
DEPARTMENT OF WATER & ENERGY (Now Department of Environment Climate Change & Water)	Objectives and regulatory requirements of Water Act 1912 and Water Management Act 2000
	If site is within a gazetted WSP area, proposal is to demonstrate consistency with the rules of the WSP
	Assessment required to take into consideration relevant NSW policies in relation to Groundwater, Wetlands, Rivers/Estuaries, Weirs etc (refer response for full list)
	Assessment required to take into account DWE Guideline for controlled activities – Riparian Corridors (& associated Vegetation Management Plans). In particular, must provide Core riparian zones plus vegetated buffers.
	Assessment required to identify key groundwater issues & potential degradation to the groundwater source (refer response for list of specific

AGENCY	ISSUE
	requirements)
	Where potential impacts identified, assessment will need to identify limits to the level of impact and contingency measures that would remediate, reduce or manage potential impacts to the existing groundwater resource and any dependent ground water environment or water users (refer response for specific requirements)
	Any proposed groundwater works, including bores for the purposes of investigation extraction, testing or monitoring, must be identified and an approval obtained from DWE prior to their installation
	Any assessment is required to identify any impacts of Groundwater Dependant Ecosystems
	Any assessment is required to consider the impact of the proposal on the watercourses and associated riparian vegetation within the site, by providing: • Identification of the sources of surface water • Details of stream order using the Strahler system • Details of any proposed surface water extraction, including purpose, location of existing and proposed pumps, dams, diversions, cuttings and levees. • Detailed description of any proposed methods of excavation, construction and material placement • A detailed description of all potential environmental impacts of any proposed development in terms of riparian vegetation, sediment movement, water quality and hydraulic regime. • a description of the design features and measures to be incorporated into any proposed development to guard against long term actual and potential environmental disturbances, particularly in respect of maintaining the natural hydrological regime and sediment movement patterns and the identification of riparian buffers
	DWE recommends the following core riparian zones (CRZ) (in their Guidelines for Controlled Activities – Riparian Corridors): • CRZ of 10m for any first order watercourse where there is a defined channel where water flows intermittently or permanently • CRZ of 20m for any permanently flowing first order watercourse, or • Any second order watercourse where there is a defined channel where water flows intermittently or permanently • CRZ of 20-40m where there is a define channel where water flows intermittently or permanently. Includes estuaries, wetlands and any parts of rivers influenced by tidal waters (merits assessment based) • An additional 10m vegetated buffer from the outer edge of the CRZ.
	Appropriate zoning of waterfront land to ensure development excluded from these areas is encouraged, where possible

AGENCY	ISSUE
	Assessment must address provision of a sustainable water supply for any proposed development, with minimal reliance on accessing valuable surface and groundwater resources. Through the implementation of BASIX, Integrated Water Cycle Management and Water Sensitive Urban Design, proposed development must also be able to exhibit high water use efficiency.
	Current legal status of any farm/water supply dams needs to be determined.
DEPARTMENT OF PRIMARY INDUSTRIES (Now Industry and Investment)	Adequate buffer zones of at least 50m around any waterways should be incorporated into any rezoning. Any development of the site should have regard for stormwater runoff and the need to detain and treat any run off generated by a more impervious catchment.
	Petroleum extraction is to be permissible in the subject area
HERITAGE COUNCIL	Investigations must be undertaken to determine the location of any heritage items within the subject area or in the vicinity and any required measures to facilitate their protection, conservation and ongoing management
	Unless there is physical on the ground evidence of historic paper subdivision patterns (such as road construction or historic fence lines), there is no requirement for these patterns to be interpreted.
	If any heritage items are identified on the land, Council should ensure that any rezoning will permit uses that are compatible with the heritage significant site or item and that it will allow for the continued use and conservation of the heritage item in an appropriate manner. Identified significant views, vistas, cultural landscapes and settings should be maintained and conserved when planning for new development areas.
	No need to return the draft LEP to Heritage office unless it is amended to include provisions that relate to or affect heritage items and /or conservation areas.
NSW HEALTH	Provision of reticulated water and sewerage supply is recommended.
	Reticulated water supply must be of sufficient quantity and quality for the population size. An increase in population reinforces the need for the water supply to meet water quality standards in the Australian Drinking Water Guidelines.
	Ensure minimal impact on the water quality of surrounding natural waterways, particularly from stormwater runoff
	Address the issue of environmental noise as exposure levels to the community may be high compared to existing levels
	Incorporation of best practice design principles in future developments include energy, water saving strategies and grey water reuse with appropriate approval and monitoring process in place to prevent risks to public health and environment contamination
	Consideration should be given to encouraging the installation of rainwater tanks on dwellings within the proposed township, for non-potable sources.

AGENCY	ISSUE
	Transport assessment to determine availability (including frequency) and access to rail and bus networks that connect Wyee residents to other services and employment. This should be conducted with specific reference to the emerging regional centre of Morisset and the new Warnervale town centre.
	Planning and designing the residential development should have consideration of • Street design that minimises distance between residential lots, neighbourhood facilities and the emerging regional centre • Provision of safe and convenient footpath and gateways for residents to access nearby facilities and the emerging regional centre regional centre, through active transport • Provision of safe and convenient public transport to enable access from residential lots to the emerging regional centre • The availability of affordable/healthy food within the established township of Wyee • safety by design principles in regard to the positioning of connectivity to open space.
HUNTER WATER	A new developer funded water reservoir will be required to be constructed.
	New reservoir be supplied from either DN 375mm water main offtakes from the DN 600mm Gosford/Wyong Pipeline
	Developer funded water supply and servicing waste water strategies to be prepared, which presents water supply, wastewater transport and possible recycled water supply options, as well as timing, staging and security of supply. There should be prepared in consultation with Hunter water.
RFS	Retention of vegetation within the site in the form of conservation areas may retain the bushfire risk and the appropriate bush fire protection measures for residential development will be required commensurate with the hazard
RTA	RTA's main concerns are with traffic generating impacts of the proposed development
	Traffic study to be prepared in accordance with RTA Guide to Traffic Generating Developments (refer their response for details to be included)
	Traffic study to consider other development proposals in the surrounding area – cumulative impact
	Developer should take into account DIPNRs Integrating Land Use Transport Planning Policy and Draft SEPP 66 – Integration of Land Use and Transport
	Identified road infrastructure improvements required on the state road network (subject to RTA approval) as a result of the traffic generated by the proposed development is to be included as part of a Voluntary Planning Agreement, which is to be entered into by the developers prior to the gazettal of the proposed LEP amendment.
	Developer will be required to provide monetary contribution towards the classified road network to offset the cumulative traffic impact of this

AGENCY	ISSUE
	development and other developments in the area.
	No direct access from the subject site onto the F3 Freeway or Wyee Road. All access shall be via the local road network to Council's requirements.
	Any issues under SEPP Infrastructure should be addressed in the master plan and development stage
	RTA objects to the draft amendment to the LEP due to limited information and will not withdraw objection until after a details traffic and transport study is undertaken.
	Council should ensure that the applicants are aware of the potential for road traffic noise to impact on any future development of the area. In this regard, the applicant, not the RTA, is responsible for providing noise attenuation measures in accordance with the EPAs Environmental Criteria for Road Traffic Noise.
WYONG SHIRE COUNCIL	Council would be appreciative of the opportunity to be consulted with, particularly in relation to the following matters:
	Provision of infrastructure
	Traffic impacts (particularly Bushells Ridge Rd) and upgrade requirements
	Proposed zonings and how they might link with development opportunities/conservation areas in Wyong LGA
	Assessment of requirements for provision of community facilties and services
	Potential land use conflicts with mining operations
	Consultation with Aboriginal Land Councils
	Consideration Nth Wyong Structure Plan & Draft Central Coast Regional Strategy
MSB	MSB have no objection to the proposed rezoning. The area is not within a proclaimed Mine Subsidence District.

2 Study Area

2.1 Location

Wyee township is located immediately north of the southern boundary of Lake Macquarie City and Wyong Shire, approximately 9km south of Morisset. The town is located on the main northern rail line, to the east of the Sydney-Newcastle (F3) Freeway (Figure 2-1).

The subject site is located west of the railway line, and is bounded Hue Hue Road to the north and Bushells Ridge Road to the south. The F3 Freeway is approximately 600m to the west (Figure 2-2).

2.2 Description

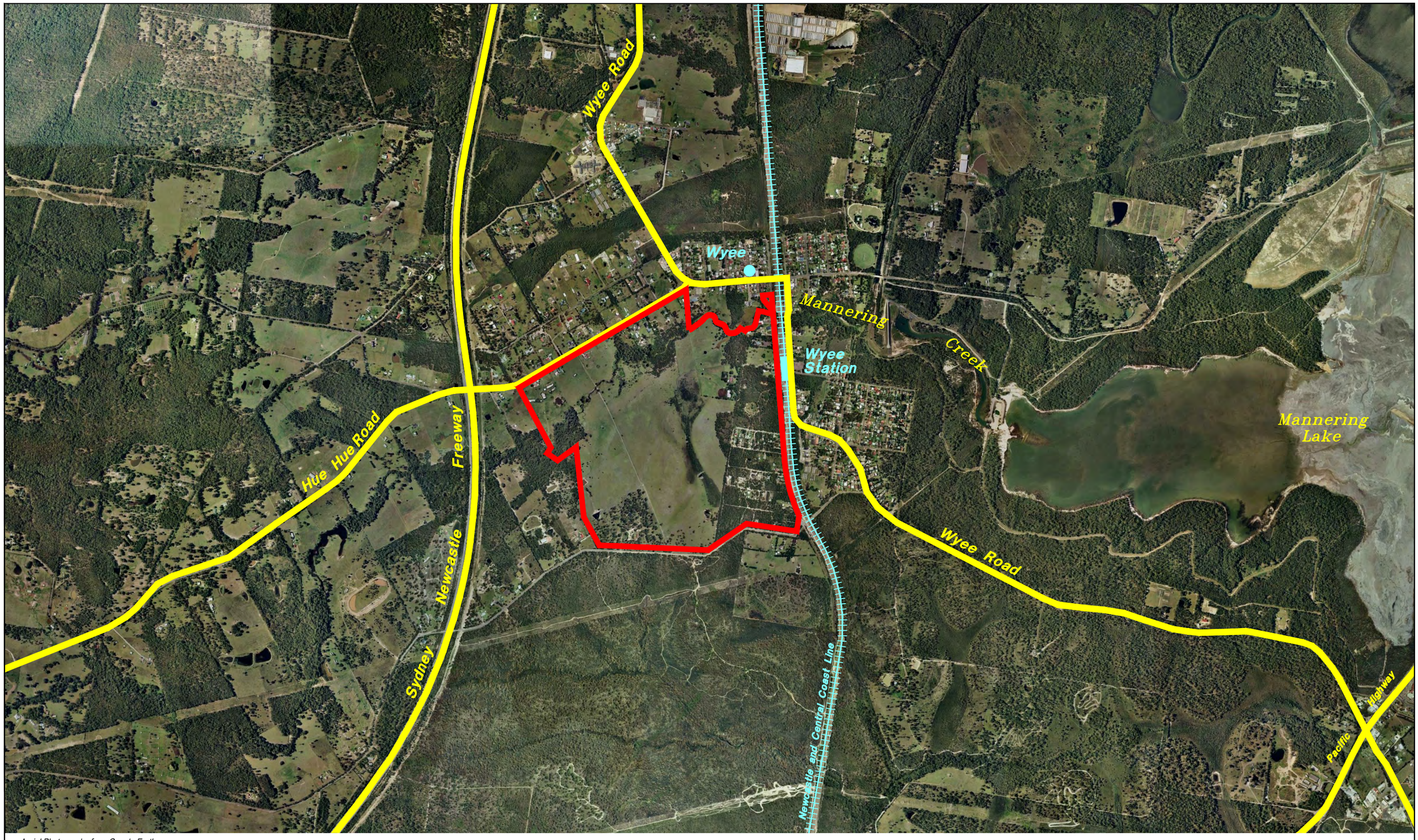
The study area has a total area of approximately 153ha and consists of a number of individual properties, as follows:

Table 2-1: Property Descriptions

Lot	DP	Lot	DP
17	870597	8	857
212	866437	4	1013240
16	870597	1	103856
1	244839	1	103857
1	785709	185	650204
215	860081	1582	1121660
202-400	7506	9	1058113
210	846801	186-189, 323-324, 428-431, 441-443, 472-473	755242

The site is zoned predominantly 1(1) Rural Production under the LMLEP 2004, with a number of conservation and open space zones and one parcel of land zoned 5 for Infrastructure (Figure 2-3).

The subject site comprises cleared agricultural grazing land with sparse vegetation and some more densely vegetated areas along the eastern boundary. Some large lot residential development exists along Hue Hue Road. Other residential development is located within the south eastern corner of the site, which is discussed further in Section 2.3 below.



Aerial Photography from Google Earth.

200 00 200 400 600 800 1000 1200 1400 1600 1800 2000 2200 2400 2600 2800m

Level Datum		Date	11 OCT 2010
Origin	NORTH	Comp By.	BJS / KCH
		DWG Name.	MA08342_CONSTRAINTS
		Local Authority	LAKE MACQUARIE C.C.
Scale	Sheet	Locality	WYEE
1 : 20000	A3	Job Reference	MA08342

CLIENT

LAKE MACQUARIE CITY COUNCIL

LOCALITY PLAN

PROJECT

WYEE

Plan Ref **MA08342**

Rev

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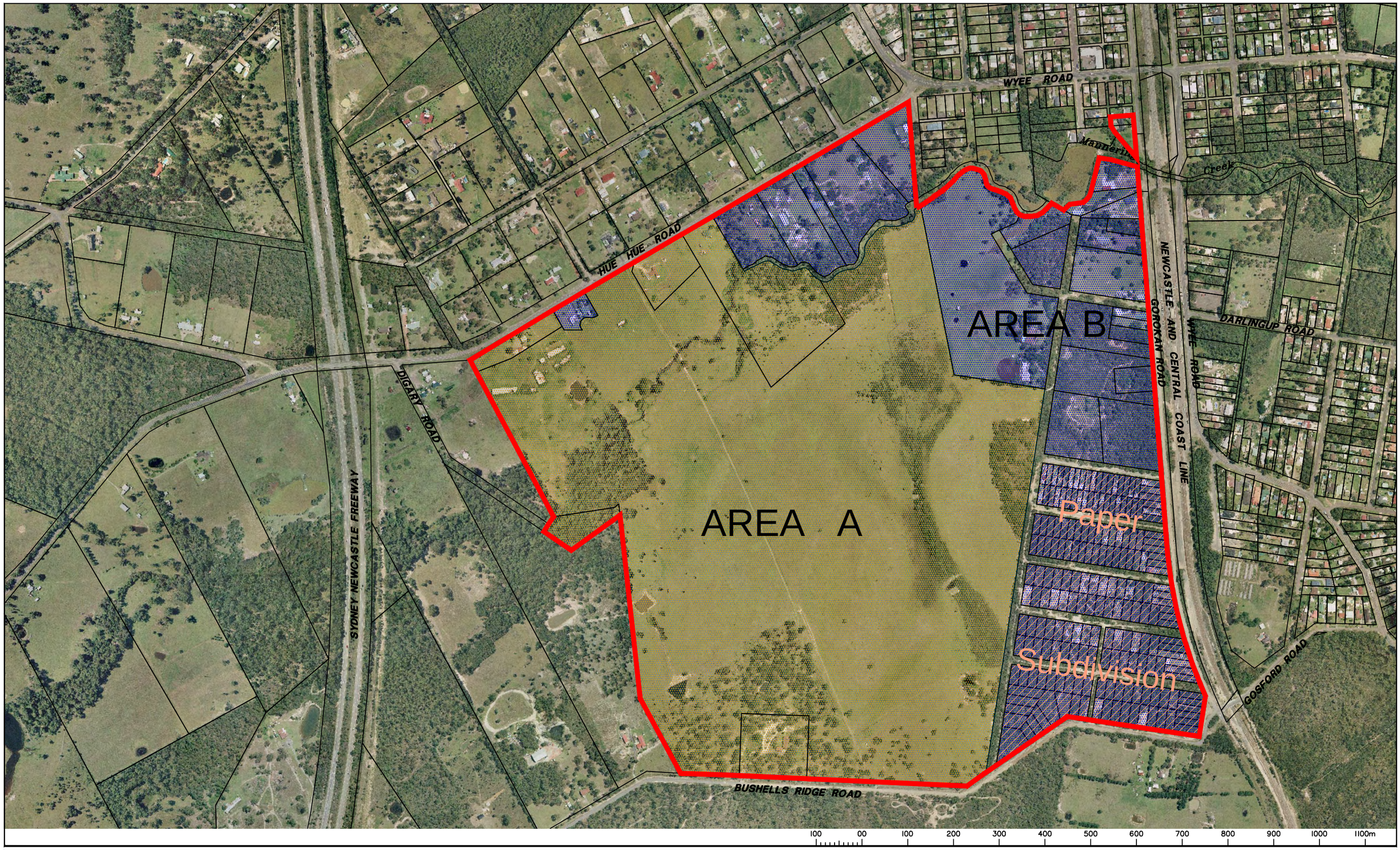

Level Datum	Date	11 OCT 2010	CLIENT **LAKE MACQUARIE CITY COUNCIL**
Origin NORTH	Comp By.	BJS / KCH	PROJECT **WYEE**
	DWG Name.	MA08342_CONSTRAINTS	
	Local Authority	LAKE MACQUARIE C.C.	
Scale 1 : 7500 Sheet A3	Locality	WYEE	*SITE PLAN*
	Job Reference	MA08342	Plan Ref **MA08342** Rev

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ZONE INDEX

LEP 2004

1. RURAL

- 1(1) 1(1) Rural (Production)
- 1(2) 1(2) Rural (Living)

2. RESIDENTIAL

- 2(1) 2(1) Residential
- 2(2) 2(2) Residential (Urban Living)

3. BUSINESS

- 3(1) 3(1) Urban Centre
- 3(2) 3(2) Urban Centre (Support)

4. INDUSTRIAL

- 4(1) 4(1) Industrial (Core)
- 4(2) 4(2) Industrial (General)
- 4(3) 4(3) Industrial (Urban Services)

5. INFRASTRUCTURE

- 5 5 Infrastructure

6. OPEN SPACE

- 6(1) 6(1) Open Space
- 6(2) 6(2) Tourism and Recreation

7. ENVIRONMENTAL PROTECTION

- 7(1) 7(1) Conservation (Primary)
- 7(2) 7(2) Conservation (Secondary)
- 7(3) 7(3) Environmental (General)
- 7(4) 7(4) Environmental (Coastline)
- 7(5) 7(5) Environmental (Living)

8. NATIONAL PARK

- 8 8 National Park

9. NATURAL RESOURCES

- 9 9 Natural Resources

10. INVESTIGATION

- 10 10 Investigation Zone

11. LAKE AND WATERWAYS

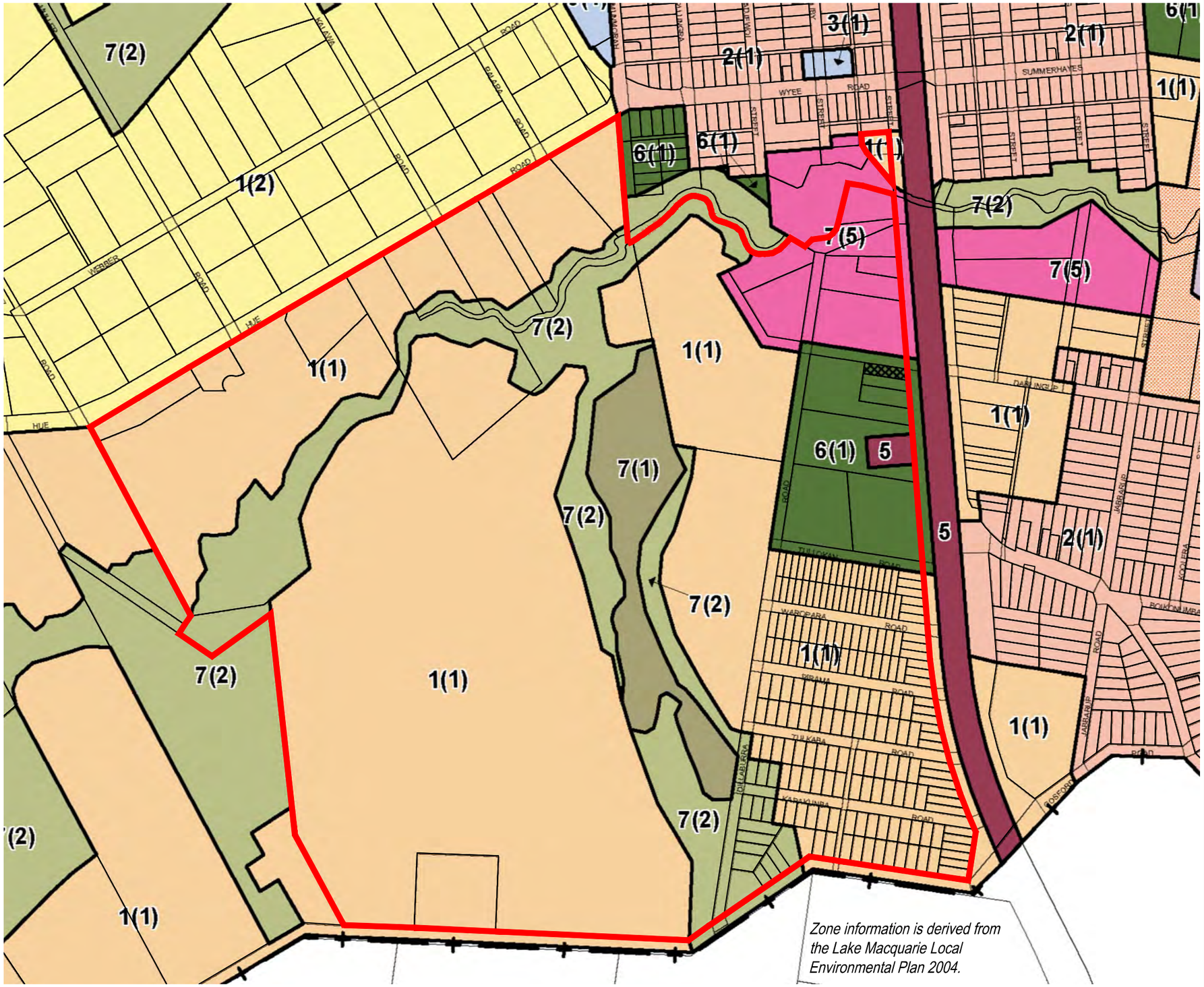
- 11 11 Lake and Waterways

12. ACQUISITION

- Acquisition (LMCC)
- Acquisition (RTA)
- Acquisition (Dept. of Planning)

13. OTHER

- Proposed Heritage Conservation Area
- Local Government Boundary



Zone information is derived from the Lake Macquarie Local Environmental Plan 2004.

Level Datum	Date	11 OCT 2010	CLIENT: **LAKE MACQUARIE CITY COUNCIL**
Origin: NORTH	Comp By.	BJS / KCH	PROJECT: **WYEE**
	DWG Name.	MA08342_CONSTRAINTS	
	Local Authority	LAKE MACQUARIE C.C.	*ZONING PLAN*
Scale: *1 : 7500* Sheet: *A3*	Locality	WYEE	Plan Ref: **MA08342** Rev:
	Job Reference	MA08342	

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The topography of the site is generally comprised of rolling hills, with slopes falling gently to the north-east. Surface elevations range from RL 50 m AHD in the southwestern corner to less than RL 20 m AHD in the northern area of the site. Slopes on the site are generally less than 11%.

There are three main high points on the site:

- In the south-western corner at approximately RL 50 m AHD, from which there is a broad ridge which protrudes northward into the site
- In the south-eastern area of the site at approximately RL 40 m AHD, adjacent to Bushells Ridge Road, from which a narrow but low ridge protrudes northwards into the site
- In the north-eastern corner at approximately RL 30 m AHD.

Mannering Creek traverses the northern portion of the site, entering near the western boundary of the site and exiting at the north-eastern corner. Wyee Dam is located approximately 800m to the east of the site along Mannering Creek. An unnamed creek, which feeds into Mannering Creek, flows from near the southern boundary of the site in a generally northern direction to discharge into Mannering Creek in the northern section of the site.

2.3 Land Use & Settlement Pattern

The Wyee township comprises predominantly low density residential allotments with detached housing, interspersed with rural properties and rural residential allotments.

The town centre is situated on Wyee Road, and comprises a small commercial/retail centre, surrounded by detached residential development. Residential development also occurs further south off Wyee Road, directly opposite the subject site on the eastern side of the railway.

Part of the subject site is a paper subdivision. This land was subdivided in the early 1900's into lots that would probably be of a suitable size and format for housing development in a conventional serviced residential area. However, the land is zoned 1(1) Rural (Production) which is reflective of the land not having undergone environmental and other studies to determine its suitability for residential development, and its lack of services, including formed and sealed roads, sewer, and water. A number of unauthorised dwellings exist in this area.

3 Statutory Planning Framework

3.1 Environmental Planning and Assessment Act 1979

The Environmental Planning and Assessment Act 1979 (The EP&A Act) is the primary planning legislation in NSW. The objects of the Act are:

(a) to encourage:

(i) the proper management, development and conservation of natural and artificial resources, including agricultural land, natural areas, forests, minerals, water, cities, towns and villages for the purpose of promoting the social and economic welfare of the community and a better environment,

(ii) the promotion and co-ordination of the orderly and economic use and development of land,

(iii) the protection, provision and co-ordination of communication and utility services,

(iv) the provision of land for public purposes,

(v) the provision and co-ordination of community services and facilities, and

(vi) the protection of the environment, including the protection and conservation of native animals and plants, including threatened species, populations and ecological communities, and their habitats, and

(vii) ecologically sustainable development, and

(viii) the provision and maintenance of affordable housing, and

(b) to promote the sharing of the responsibility for environmental planning between the different levels of government in the State, and

(c) to provide increased opportunity for public involvement and participation in environmental planning and assessment.

These objectives have been considered in the preparation of this LES and have informed the preferred land use strategy.

On 1 July 2009 a number of changes were made to the EP&A Act in relation to rezonings and amendments to local environmental plans (LEPs). Prior to 1 July 2009 rezonings in NSW fell under Part 3 Division 4 of the EP&A Act. This represented Clauses 53 to 70 of the Act. From the 1 July 2009 rezonings still fall under Part 3 Division 4 but this Division is now defined by Clauses 53-60.

Although the legislation may have changed as at 1 July 2009, savings and transitional provisions were gazetted that enabled LEPs currently in preparation to still proceed under the provisions of the EP&A Act prior to 1 July 2009. This situation applies to the subject site.

In practice, this means that whenever the EP&A Act is referred to in this LES it represents the EP&A Act and its relevant clauses prior to 1 July 2009. The legislation changes do not reduce the issues that need to be considered in rezoning a site, or the standards of an LES, but just reflect a new process for rezoning sites.

3.2 State Environmental Planning Policies (SEPPs)

There are a number of State Environmental Planning Policies that will apply to the subject site. These are introduced in the following sections.
Section 10.3 of this study outlines the consistency of the preferred land use strategy with these relevant SEPPs.

3.2.1 SEPP 19 – Bushland in Urban Areas

Lake Macquarie local government area comes under the provision of SEPP 19. The general aim of this SEPP is to protect and preserve bushland within urban areas. The specific aims are to:

- *Protect the remnants of plant communities which were once characteristic of land now within an urban area*
- *Retain bushland in parcels of a size and configuration which will enable the existing plant and animal communities to survive in the long term*
- *Protect rare and endangered flora and fauna species*
- *Protect habitats for native flora and fauna*
- *Protect wildlife corridors and vegetation links with other nearby bushland*
- *Protect bushland as a natural stabiliser of the soil surface*
- *Protect bushland for its scenic values, and to retain the unique visual identity of the landscape*
- *Protect significant geological features*
- *Protect existing landforms, such as natural drainage lines, watercourses and foreshores*
- *Protect archaeological relics*
- *Protect the recreational potential of bushland*
- *Protect the educational potential of bushland*
- *Maintain bushland in locations which are readily accessible to the community*
- *Promote the management of bushland in a manner which protects and enhances the quality of the bushland and facilitates public enjoyment of the bushland compatible with its conservation.*

In general, a person cannot disturb bushland zoned or reserved for public open space purposes without the consent of the council. In regards to preparing a draft local environmental plan, other than rural land, a council shall:

- *Have regard to the general and specific aims of the Policy, and*
- *Give priority to retaining bushland, unless it is satisfied that significant environmental, economic or social benefits will arise which outweigh the value of the bushland.*

An ecological assessment has been prepared for the subject site. This ecological assessment is presented in **Appendix 3** and will be used in developing the preferred land use strategy for the site.

3.2.2 SEPP 44 – Koala Habitat

SEPP 44 aims to encourage the conservation and management of areas of native vegetation that provide habitat for koalas. It aims to ensure that permanent free-living populations will be maintained over their present range. It also outlines the procedures for the identification of core and non-core Koala habitat and encourages the placement of core Koala habitats in environmental protection zones. SEPP 44 applies to all local government areas listed in Schedule 1 of the Policy, which includes Lake Macquarie.

The ecological assessment has considered whether or not the site is likely to comprise koala habitat and concludes that it is not considered to provide high value koala habitat.

3.2.3 SEPP 55 – Remediation of Land

This policy provides a State-wide planning approach to the remediation of contaminated land, and aims to reduce the risk associated with contaminated land. It specifies certain considerations which are relevant to rezoning applications.

Clause 6 of the policy requires the consideration of whether land proposed to be rezoned is contaminated, and if so, whether the land is suitable in its contaminated state (or will be suitable, after remediation) for the purposes permitted in the proposed zone. A preliminary contamination investigation of the land must be carried out in accordance with the relevant contaminated land planning guidelines.

If the land requires remediation the planning authority must be satisfied that the land will be remediated before the land is used for that purpose. In this regard, the planning authority may need to include certain provisions in the environmental planning instrument.

A preliminary geotechnical and contamination assessment has been prepared to inform the LES and is provided in **Appendix 4 and 4A**.

3.2.4 SEPP – Major Development

This SEPP provides guidelines and benchmarks as to when a project is considered to be 'regional development' or 'state significant development'. Any development which is classified as 'regional' is consented to by a Joint Regional Planning Panel (JRPP). Any project that is considered to be of state significance is assessed under Part 3A of the EP&A Act and the Minister for Planning (or delegated authority) is the consent authority.

This SEPP may apply to the subject site at the DA stage, depending on the size of any future subdivision and development.

3.2.5 SEPP – Mining, Petroleum Production and Extractive Industries

Clause 13 of this SEPP requires a consent authority to consider the impact a development will have on an existing mine, petroleum production or extractive industry. The Department of Primary Industries (DPI) has noted that the site is located within Petroleum Exploration Licence (PEL) 5 held by Sydney Gas Operations Pty Ltd. They state that the area has very high Coal Seam Methane (CSM) potential.

Before determining a Development Application, Council must consider:
a) the existing uses and approved uses of land in the vicinity of the development
b) whether or not the development is likely to have a significant impact on current or future extraction or recovery of minerals, petroleum or extractive materials (including by limiting access to, or impeding assessment of those resources)
c) any ways in which the development may be incompatible with any of those existing or approved uses or that current or future extraction or recovery.

The consent authority must also evaluate and compare the respective public benefits of the development and the uses, extraction and recovery as identified in points a) and b) above, and evaluate any measures proposed by the applicant to avoid or minimise any incompatibility, as referred to in point c) above. Further consultations should occur with the Department of Primary Industries (DPI) at the appropriate stage.

3.2.6 SEPP – Infrastructure

The Infrastructure SEPP was gazetted in 2007. The objectives of the SEPP are to:

- *Improve regulatory certainty and efficiency through a consistent planning regime for infrastructure and the provision of services*
- *Provide greater flexibility in the location of infrastructure and service facilities*
- *Allow for the efficient development, redevelopment and disposal of surplus government owned land*
- *Identify the environmental assessment category into which different types of infrastructure and services development fall (including identifying certain development of minimal environmental impact as exempt development)*
- *Identify matters to be considered in the assessment of development adjacent to particular types of infrastructure development*
- *Provide for consultation with relevant public authorities about certain development during the assessment process or prior to development commencing.*

The SEPP identifies a number of exemptions in relation to infrastructure provision, as well as development controls in relation to airports, correctional facilities, educational establishments, hospitals, electricity, gas, sewerage and water infrastructure, forestry, public housing, ports, rail and road infrastructure, and telecommunications.

Part 3 Division 17 relating to road and traffic is potentially of relevance to the subject site. Under this division Clause 104 notes that a development application (DA) must give consideration to comments made by the RTA regarding the development of new or the enlargement of premises. Should this apply to any future development, consultations with the RTA would need to occur at the DA stage.

Clause 106 of *State Environmental Planning Policy (Infrastructure) 2007* provides that development associated with sewage treatment plants may be carried out by or on behalf of a public authority or any person licensed under the *Water Industry Competition Act 2006* without development consent being granted under Part 4 of the EP&A Act on land in a "prescribed zone" and that sewerage reticulation systems may be carried out by or on behalf of a public authority or any person licensed under the *Water Industry Competition Act 2006* on any land without development consent. This is discussed in further detail in Section 6.2.2.

3.2.7 SEPP – Building Sustainability Index (BASIX)

All residential dwellings on the site would have to meet the water and energy efficiency requirements of the BASIX SEPP before a DA is approved by the consent authority.

3.3 Section 117 Directions

On 19 July 2007 the Minister for Planning released a series of Directions under Section 117 (S117) of the EP&A Act. The S117 Directions that apply to the subject site are discussed below.

3.3.1 Direction 1.2 – Rural Zones

The objective of this direction is to protect the agricultural production value of rural land.

This direction applies when a relevant planning authority prepares a draft LEP that will affect land within an existing or proposed rural zone (including the alteration of any existing rural zone boundary).

A significant portion of the land is zoned for rural purposes. The rezoning of this land will consider the social, economic and environmental issues apparent over the site and provide a justification for the rezoning of any rural land.

3.3.2 Direction 1.3 – Mining, Petroleum and Extractive Industries

The objective of this Direction is to ensure that the future extraction of State or regionally significant reserves of coal, other minerals, petroleum and extractive materials are not compromised by inappropriate development.

This Direction applies when a Council prepares a Draft LEP that would have the effect of:

- prohibiting the mining of coal or other minerals, production of petroleum, or winning or obtaining of extractive materials, or
- restricting the potential development of resources of coal, other minerals, petroleum or extractive materials which are of State or regional significance

by permitting a land use that is likely to be incompatible with such development.

The NSW Department of Primary Industries (DPI) were consulted prior to the completion of this LES under Section 62 of the EP&A Act to ensure development is consistent with the objectives of this Direction. The DPI note that there is a petroleum exploration licence in the area. Consideration is given to this issue in developing the preferred land use strategy, later in the LES.

3.3.3 Direction 1.5 – Rural Lands

The objectives of this direction are to protect the agricultural production value of rural land and facilitate the orderly and economic development of rural lands for rural and related purposes.

A draft LEP affecting a rural or environmental protection zone must be consistent with the Rural Planning Principles listed in State Environmental Planning Policy (Rural Lands) 2008, unless the provisions of the draft LEP that are inconsistent are:

- justified by a strategy which:
    - gives consideration to the objectives of this direction,
    - identifies the land which is the subject of the draft LEP (if the draft LEP relates to a particular site or sites, and
    - is approved by the Director-General of the Department of Planning and is in force, or
- is of minor significance.

The proposed rezoning is consistent with the Lower Hunter Regional Strategy, which is considered and discussed Section in 4.1.

3.3.4 Direction 2.1 – Environmental Protection Zones

The objective of this direction is to protect and conserve environmentally sensitive areas. A council must ensure:

- A draft LEP includes provisions that facilitate the protection and conservation of environmentally sensitive areas.
- A draft LEP that applies to land within an existing environmental protection zone or land otherwise identified for environmental protection purposes in a LEP shall not reduce the environmental protection standards that apply to the land (including by modifying any development standards or subdivision controls that apply to the land). This requirement does not apply to a change to a development standard for minimum lot size for a dwelling in accordance with clause (5) of Direction 1.5 "Rural Lands".

The riparian zones around Mannering Creek and tributary, as well as an area in the north eastern corner of the site are currently zoned for environmental conservation under Lake Macquarie LEP. Parts of the site are heavily vegetated and an ecological assessment has been prepared for the site. The results of the assessment will be taken

into consideration along with other environmental and planning documents, to identify areas appropriate for conservation purposes in line with the site's role in the broader urban context.

3.3.5 Direction 2.3 – Heritage Conservation

The objective of this direction is to conserve items, areas, objects and places of environmental heritage significance and indigenous heritage significance. A council must ensure a draft LEP shall contain provisions that facilitate the conservation of:

(a) items, places, buildings, works, relics, moveable objects or precincts of environmental heritage significance to an area, in relation to the historical, scientific, cultural, social, archaeological, architectural, natural or aesthetic value of the item, area, object or place, identified in a study of the environmental heritage of the area,

(b) Aboriginal objects or Aboriginal places that are protected under the National Parks and Wildlife Act 1974, and

(c) Aboriginal areas, Aboriginal objects, Aboriginal places or landscapes identified by an Aboriginal heritage survey prepared by or on behalf of an Aboriginal Land Council, Aboriginal body or public authority and provided to the council, which identifies the area, object, place or landscape as being of heritage significance to Aboriginal culture and people.

The Aboriginal heritage assessment (**Appendix 5**) for the subject site has identified a number of items. The archaeology assessment has made a number of recommendations regarding future development in relation to the Aboriginal archaeological items. These items will need to be considered in developing appropriate zoning and planning controls across the subject site.

3.3.6 Direction 2.4 – Recreation Vehicle Areas

The objective of this direction is to protect sensitive land or land with significant conservation values from adverse impacts from recreation vehicles.

A draft LEP shall not enable land to be developed for the purpose of a recreation vehicle area where the land is within an environmental protection zone unless the council has taken into consideration:

- the provisions of the guidelines entitled *Guidelines for Selection, Establishment and Maintenance of Recreation Vehicle Areas, Soil Conservation Service of New South Wales, September, 1985*, and
- the provisions of the guidelines entitled *Recreation Vehicles Act, 1983, Guidelines for Selection, Design, and Operation of Recreation Vehicle Areas, State Pollution Control Commission, September 1985.*

No recreational vehicle areas are proposed as part of the rezoning.

3.3.7 Direction 3.1 – Residential Zones

The objectives of this direction are to encourage diversity in housing types, to make efficient use of existing infrastructure and services and to minimise the impact of

residential development on the environment and resource lands. Given that the proposed rezoning will include provision for residential zoned land, this direction is a relevant consideration.

Consideration has been given to the objectives of this Direction in preparing this study and in developing the preferred land use strategy for the subject site. The social and economic impact assessments investigate the appropriate mix of housing on the site and the infrastructure assessment investigates the capacity of existing services.

3.3.8 Direction 3.2 – Caravan Parks & Manufactured Home Estates

The objectives of this direction are to provide for a variety of housing types, and to provide opportunities for caravan parks and manufactured home estates. It requires Councils to retain existing provisions that permit development for caravan parks and to consider appropriate locations for manufactured home estates.

The LES will consider the most appropriate land use for the site based on a through investigation of site attributes and features, as well as relevant planning policy. In terms of permitted land uses, this is something that will be determined as part of Council's new LEP process and this direction will need to be considered then.

3.3.9 Direction 3.3 – Home Occupations

The objective of this direction is to encourage the carrying out of low-impact small businesses in dwelling houses and states that draft LEPs shall permit home occupations without the need for development consent.

This will be considered as part of the LES.

3.3.10 Direction 3.4 – Integrating Land Use and Transport

The objective of this direction is to ensure that urban structures, building forms, land use locations, development designs, subdivision and street layouts achieve the following planning objectives:

(a) improving access to housing, jobs and services by walking, cycling and public transport, and
(b) increasing the choice of available transport and reducing dependence on cars, and
(c) reducing travel demand including the number of trips generated by development and the distances travelled, especially by car, and
(d) supporting the efficient and viable operation of public transport services, and
(e) providing for the efficient movement of freight.

This direction applies when a council prepares a draft LEP that creates, alters or removes a zone or a provision relating to urban land, including land zoned for residential, business, industrial, village or tourist purposes.

A council must ensure that a draft LEP shall locate zones for urban purposes and include provisions that give effect to and are consistent with the aims, objectives and principles of:
(a) *Improving Transport Choice* – Guidelines for planning and development (DUAP 2001), and
(b) *The Right Place for Business and Services* – Planning Policy (DUAP 2001).

Consideration has been given to the objectives of this Direction and the Department of Planning's policy documents in preparing this environmental study.

3.3.11 Direction 4.1 – Acid Sulfate Soils

The objective of this direction is to avoid significant adverse environmental impacts from the use of land that has a probability of containing acid sulfate soils. This direction applies when a council prepares a draft LEP that will apply to land having a probability of containing acid sulfate soils as shown on the Acid Sulfate Soils Planning Maps. If this direction applies a council must ensure:

The preliminary geotechnical and contamination assessment concluded that the presence of acid sulfate soils on the site is unlikely, however further detailed testing would need to confirm this at development application stage. Should any development take place in areas identified as containing acid sulphate soils than an Acid Sulfate Soil Management Plan will also be required.

3.3.12 Direction 4.3 – Flood Prone Land

The objectives of this direction are to ensure that development of flood prone land is consistent with the NSW Government's Flood Prone Land Policy and the principles of the Floodplain Development Manual 2005, and to ensure that the provisions of an LEP on flood prone land is commensurate with flood hazard and includes consideration of the potential flood impacts both on and off the subject land.

This direction applies when a council prepares a draft LEP that creates, removes or alters a zone or a provision that affects flood prone land. It states that a draft LEP shall not rezone land within the flood planning areas from Special Use, Special Purpose, Recreation, Rural or Environmental Protection Zones to a Residential, Business, Industrial, Special Use or Special Purpose Zone.

Parts of the subject site adjacent to Lake Macquarie are identified as being within the 1 in 100 year flood zone. The LES (and future LEP) needs to consider the consistency of the development proposal with the NSW Government's Flood Prone Land Policy and the principles of the Floodplain Development Manual. A water management assessment has been prepared for the subject site (**Appendix 6**).

3.3.13 Direction 4.4 – Planning for Bushfire Protection

The objectives of this direction are to protect life, property and the environment from bush fire hazards, by discouraging the establishment of incompatible land uses in bush fire prone areas, and to encourage sound management of bush fire prone areas.

The subject site is within a bushfire prone area. The LES ensures appropriate Asset Protection Zones (APZs) are able to be provided and consider the 2006 'Planning for Bushfire Guidelines'. Future development applications will need to demonstrate adequate APZs. Council has consulted with the Rural Fire Service (RFS) under Section 62 of the EP&A Act. It is considered that the bushfire assessment prepared for the subject site (**Appendix 7**) meets the requirements of Planning for Bushfire Protection as identified by the RFS. This is also dealt with in Section 5.4 of this LES.

3.3.14 Direction 5.1 – Implementation of Regional Strategies

The objective of this direction is to give legal effect to the provisions contained in regional strategies. Draft LEPs are required to be consistent with the vision, land use strategy, policies, outcomes and actions contained in regional strategies. The Lower Hunter Regional Strategy (LHRS) is listed in this Direction, and the LHRS applies to the subject site.

Wyee has been specifically identified as a growth area in the LHRS. The provision, principles and objectives of the LHRS will need to be considered in assessing this proposal. The LHRS has been discussed in detail in Section 4.1.

3.3.15 Direction 6.1 – Approval and Referral Requirements

The objective of this Direction is to ensure that LEP provisions encourage the efficient and appropriate assessment of development. A draft LEP shall:

- minimise the inclusion of provisions that require the concurrence, consultation or referral of development applications to a Minister or public authority, and
- not contain provisions requiring concurrence, consultation or referral of a Minister or public authority unless the council has obtained the approval of:
  - the appropriate Minister or public authority, and
  - the Director-General of the Department of Planning (or delegate)
  - prior to a certificate under Section 65 of the Act being issued, and not identify development as designated development unless the Council:
- can satisfy the Director-General of the Department of Planning (or delegate) that the class of development is not likely to have a significant impact on the environment, and
- has obtained the approval of the Director-General of the Department of Planning (or delegate) prior to a certificate being issued under Section 65 of the Environmental Planning and Assessment Act 1979.

3.3.16 Direction 6.2 – Reserving Land for Public Purposes

The objectives of this direction are:

(a) to facilitate the provision of public services and facilities by reserving land for public purposes, and
(b) to facilitate the removal of reservations of land for public purposes where the land is no longer required for acquisition.

A planning proposal must not create, alter or reduce existing zonings or reservations of land for public purposes without the approval of the relevant public authority and the Director-General of the Department of Planning (or an officer of the Department nominated by the Director-General).

The site includes land zoned for open space purposes and the LES considers inclusion of additional open space zoned land within the preferred land use strategy. This will require Council to consult further with the Department of Planning as the LEP is drafted.

3.4 Lake Macquarie Local Environmental Plan 2004

The Lake Macquarie Local Environmental Plan 2004 (LEP) is the primary planning instrument applying to the site. It aims to promote development in accordance with the principles of ecologically sustainable development and also to foster balanced development of land. The LEP also seeks to implement Council's *Lifestyle 2020 Strategy*, which is discussed below.

The site is comprised of a number of zones, including 1(1) Rural Production, 5 Infrastructure, 6(1) Open Space 7(1) Conservation (Primary) 7(2) Conservation (Secondary) and 7(5) Environmental (Living) (refer Figure 2-3).

In preparing the preferred land use strategy for the subject sites, the aims and objectives of each of these zones will be considered, along with other relevant zones. This LES will assess other relevant zones that may be applicable under the LEP, including Conservation zones. An assessment of preferred land uses and zones for the subject site is identified in Section 10.

3.5 Lake Macquarie Development Control Plan No. 1

Lake Macquarie Development Control Plan (DCP) No 1 (DCP 1) provides guidance to the development of land under Lake Macquarie LEP 2004 and is intended to act as an integrated planning document in conjunction with LEP 2004. The primary objective of DCP 1 is to implement the Lifestyle 2020 Strategy by facilitating Ecologically Sustainable Development. It adopts a performance approach to managing development and is represented in the following 3 key components:

- **Intent Statements** - outlining the underlying purpose of the Council requirements.

- **Performance Criteria** - detailing what outcomes need to be met to achieve the intent.
- **Acceptable Solutions** - the means, recommended by Council, of satisfying the performance criteria. DCP 1 is an extensive document, parts of which will be relevant to any future residential development of the site. DCP 1 provides detailed planning guidelines, which development proposals should comply with. In addition, DCP 1 includes Area Plans that provide detailed, place-specific requirements with statements of Desired Future Character and specific design advice.

There are no specific Area Plans contained within the DCP that apply to Wyee, however the DCP contains general provisions and principles for development that apply to the Lake Macquarie Local Government area as a whole.

3.6 Lake Macquarie City Council Scenic Quality Guidelines

The Lake Macquarie City Council Scenic Quality Guidelines 2004 ("Scenic Guidelines" or SQG) are intended to assist in the preparation of a Visual Impact Assessment ("VIA") as required in Section 2.1.3 of DCP No. 1. Section 3 of the Scenic Guidelines states that a VIA is required for all proposals in Scenic Management Zones A and B. The subject site is identified as a combination of C and D zones, however a visual impact assessment has been prepared for the site and is presented in **Appendix 8.**

4 Strategic Planning Framework

4.1 Lower Hunter Regional Strategy 2006

Adopted in October 2006, the Lower Hunter Regional Strategy (LHRS) is the NSW Government's 25-year land use strategy for the Hunter Region, to ensure the region develops in a strong and sustainable way. The strategy is based upon a population growth scenario of an additional 125,000 persons by 2031, and promotes a hierarchy of centres, ranging from Newcastle City Centre as a regional City of national and international importance to six major regional centres, at Charlestown, Glendale/Cardiff, Maitland, Cessnock, Raymond Terrace and Morisset.

The LHRS identifies a number of principles and policy directions to guide development in the Lower Hunter Region until 2031. These include:

Population and Housing

- Provide sufficient land and development opportunities to provide housing for the future growth of the population
- Achieve higher residential densities in-and-around major centres to maximise proximity to employment and services and the use of existing infrastructure, while maintaining amenity
- Providing housing choice and affordability in the right locations reflecting changes in population and associated reduction in household occupancy rates
- Ensure quality urban design and amenity that is sensitive to and complements the character and lifestyle of the Region's towns and new urban areas
- Refocus the housing industry in the Region to increase the amount of total housing provided in the existing urban areas so that a more sustainable balance between the need for new Greenfield land releases and the ability of existing urban areas to meet housing demands is created
- Provide a framework for planning and delivering new and upgraded regional infrastructure and facilities for the growing population and ageing demographic

Economic

- Maximise the economic opportunities associated with the Region's competitive advantages, in particular its economic infrastructure and specialised centres
- Ensure sufficient employment lands are available in appropriate locations, including within centres and as traditional industrial land, to provide sufficient capacity to accommodate growth in existing and emerging industries and businesses
- Maintain or improve the employment self sufficiency of the Region

- Ensure activity within the Lower Hunter complements rather than competes with the economies and communities of adjoining regions

Environment

- Protecting and managing the biodiversity and conservation values of the key green corridors of the Region
- Maintaining or improving the biodiversity value of the Region
- Protecting the rural character and viable agricultural lands of the Region
- Protecting the mineral and coal resources of the Region

Wyee is situated within the southern-most area covered by the LHRS, and to the immediate north of land covered by the Central Coast Regional Strategy. Both these strategies are relevant to the township, which has historically had stronger connections to the south than the north.

The LHRS proposes 2000 additional dwellings be developed at Wyee by 2031. Morisset is the closest nominated regional centre, located approximately 9km to the north and has been identified in the LHRS as catering for an additional 1600 jobs and 600 dwellings by 2031.

One of the key themes within the LHRS is the emphasis on encouraging urban consolidation rather than new urban development. Urban expansion is encouraged within existing urban areas. The LHRS also has a transport-oriented focus and emphasises the importance of access to public transport for new development.

The future development of Wyee has been envisaged is the LHRS, and this LES represents an early step in the expansion of the existing urban village. Given its potential future size, it is likely that the township will continue to rely on other centres for major services and retail, however it has good access to rail and road transport.

4.2 Central Coast Regional Strategy

The Central Coast Regional Strategy (CCRS) was finalised in 2008 by the NSW Government and proposes significant potential employment lands just south of Wyee, as well as additional urban release lands.

A new 119 ha town centre at Warnervale is proposed several kilometres to the south of Wyee, and is accompanied by the extensive Wyong Employment Zone to its west. Around 5000 residents are expected to be housed in the Warnervale Town Centre and 6000 jobs in the Wyong Employment Zone with another 4500 jobs to be located elsewhere in employment land within the North Wyong Structure Plan area (including the "constrained" employment land immediately south of Wyee). Employment targets are not specified for the Warnervale Town Centre (they are aggregated with those of other centres), but they are in addition to those shown above. The CCRS proposes that a North Wyong Structure Plan be produced to define the areas available for

development as well as to manage growth in the north of Wyong Shire. The Structure Plan is proposed to be completed in early 2011.

A significant amount of the future residential and employment land supply in the Central Coast will come from the North East Wyong/Warnervale area. Much of Wyee's growth has been from households relocating from the Central Coast. Wyee is also highly dependent on employment and services provided within the Central Coast. Accordingly, the CCRS and the North Wyong Structure Plan are highly important to the future growth and planning of Wyee.

4.3 Lifestyle 2020 Strategy

The Lifestyle 2020 Strategy is a local policy which deals with the management of Lake Macquarie's expected population and employment growth until 2020. Core values identified in the Strategy include the need for sustainability, equity, efficiency and liveability.

Lifestyle 2020 underpins the Lake Macquarie LEP 2004 and development controls plans. The strategy aims to:

- Provide the community with a realistic expectation about the future development patterns of the City, while retaining flexibility for land use decision making in the longer term
- Reinforce and strengthen Centres so that a wide range of commercial and community services may be provided in a timely and accessible manner
- Provide local employment opportunities for residents and to promote economic development consistent with the City's natural, locational and community resources
- Guide the development of urban communities which are compact, distinct and diverse with a range of housing types and activities
- Achieve a strong sense of positive community identity, through the development of local communities which are safe and liveable and offer a diversity of use, economic opportunity and ready access to services
- Develop an attractive urban setting for the City which reflects its physical and natural environment, and visual character
- Manage the City's natural environment so that its ecological functions and biological diversity are conserved and enhanced, and contribute to the City's overall well being
- Manage the City's heritage and economic resources, in a way that protects the value of these resources and enhances the City's character.
- Integrate land use with the efficient provision of public and private movement systems.

The strategy identifies Wyee as a "future transport node", with development to capitalise on the proximity to the Wyee railway station. The development of Wyee West (which includes the subject site) is identified as a logical location for urban

expansion, given its location in relation to the railway line and F3 freeway and its proximity to major development areas in Wyong.

Under the Green Systems Map in the strategy, the subject land is identified as mainly Semi-Rural/Open and Agricultural Landscapes, with high value habitat identified along Mannering Creek to the north and wetland identified within the area of the unnamed creek to the south-west.

The Lifestyle 2020 strategy states that development at Morisset should preclude substantial urban growth in Wyee. The Morisset Structure Plan has since been adopted by LMCC and a number of rezonings in the Morisset area are progressing.

4.4 Lower Hunter Regional Conservation Plan

The Lower Hunter Regional Conservation Plan (2009) aims to guide local level planning in order to maintain and improve the biodiversity conservation values of the region.

The Plan summarises the ecological attributes for the Western Lake Macquarie and Wyee area to include the following:

- A diverse range of vegetation communities, most of which are not adequately represented in the reserve system including Swamp Sclerophyll Forest on Coastal Floodplain, (an EEC), Tetratheca juncea and Acacia bynoeana (threatened flora species);
- Habitat for a number of threatened species including a large number of threatened forest-dependent species such as forest bats, squirrel glider, yellow bellied glider, and forest owls;
- A range of wetland dependant threatened birds many of which are listed in international treaties such as the black bittern, Australasian bittern, blue billed duck, and comb crested jacana. Threatened woodland birds such as brown treecreeper are also present;
- An important linkage between the Watagan Mountains and Lake Macquarie, contributing to north - south conservation corridors. The native vegetation in the study area contributes to this regional corridor.

The principles of biodiversity planning adopted in the draft Plan are:

- to maintain and improve ecological processes and the dynamics of terrestrial ecosystems in their landscape context
- to maintain and improve viable examples of terrestrial ecosystems throughout their natural ranges
- to maintain and improve viable populations of the various biological organisms throughout their natural ranges
- to maintain and improve the genetic diversity of the living components of terrestrial ecosystems.

The key priorities for biodiversity planning in relation to improving or maintaining biodiversity values are:

- the first priority is– to avoid losses to biodiversity and promote protection of biodiversity values in situ
- the second priority, where first priority is unachievable is– to mitigate adverse impacts to biodiversity
- the last resort is to compensate for unavoidable losses to biodiversity." Appendix 1 of the draft Plan contains offsetting principles for this purpose.

4.5 Draft Wyee Structure Plan & Background Report

The Lake Macquarie City Council's draft Wyee Structure Plan (2009) aims to inform the detailed planning and future development of Wyee. It has been compiled with reference to the Wyee Structure Plan Background Report (2009), compiled by Lake Macquarie City Council (LMCC) and Strategy Hunter Consultants.

The structure plan divides Wyee into four "Township Precincts", which have been identified as localities with strong spatial boundaries. The subject site falls within Precinct 4, which also includes land between the western boundary of the site and the freeway.

A number of structure plan principles have been developed for Wyee. These have been discussed further in Section 11.5. A key principle is that Precinct 4 should be the first to be rezoned for development. Preparation of this LES assists in fulfilling this principle.

It is envisaged that the structure plan will be finalised sometime in 2010, following further investigations in relation to infrastructure and service provision.

4.6 North Wyong Structure Plan

The Department of Planning and Wyong Shire Council are currently in the process of preparing the North Wyong Structure Plan. The structure plan is proposed for exhibition in late 2010. Given the anticipated future growth in this region, a number of strategies and plans are also being prepared for this area including the Central Coast Transport Strategy, the Wyong Shire Settlement Strategy and the Central Coast Regional Conservation Plan. No documents were available for review in preparing this LES.

It is understood that the structure plan is considering the possibility of identifying future employment land at the corner of Bushells Ridge Road and the railway line.

Increased traffic generation as a result of future development in North Wyong and Wyee and its impact on the road network will be a key consideration for any future development on the site. It will need to be assessed during a master planning exercise for the subject site, following finalisation of the Structure Plan.

5 Environmental Investigations

5.1 Geotechnical & Contamination Assessment

A preliminary geotechnical and contamination assessment was undertaken for the subject site by Douglas Partners. A copy of the report is provided in **Appendix 4**. A subsequent investigation in relation to wet and weak soils and acid sulfate soils was also undertaken. A copy of this report is provided in **Appendix 4A**.

5.1.1 Geology

The site is underlain by rocks of the Tuggerah Formation, which typically comprises lithic sandstone, red-brown and grey-green claystone and siltstone, grey siltstone and laminate, and rare conglomerate.

The central, lower area of the site, along the unnamed creek and also along Mannering Creek, is mapped as being underlain by Quaternary Alluvium, which is characterised by sand, silt, clay and gravel.

5.1.2 Soils

The majority of the site is underlain by soils of the Gorokan Soil Group, which is categorised as undulating low hills and rises of the Tuggerah Formation with slope gradients of less than 15%. Soils within this group are said to be between 0.5 m and 1.5 m deep. The limitations typically associated with these soils include extreme erosion hazard, rock outcrop, shallow highly permeable soils and very low soil fertility.

The northern area of the site, dominated by Mannering Creek, is mapped as being underlain by soils of the Wyong Soil Group, which is categorised as broad poorly drained deltaic floodplains and alluvial flats of Quaternary deposits. Soils within this group are said to be generally greater than 2 m deep. The limitations typically associated with these soils include flooding, waterlogging, foundation hazard, stream bank erosion. The soils can be strongly acidic and poorly drained with very low fertility.

Conditions encountered during field work included sand and clay soils underlain by sandstone or claystone bedrock. The soils were consistent with residual soils derived from the underlying bedrock, with the weaker deposits in the central area of the site around drainage lines consistent with alluvium.

5.1.3 Groundwater

The geotechnical assessment found that the permanent groundwater table is likely to be present at a significant depth below the ground surface (based on the site topography). Some minor seepage zones may be located at the interface of localised boundaries of relatively permeable horizons such as at the interface between sandy surface soils and

less permeable residual soils, residual soils and weathered bedrock or in weathered bedding planes (and joints) within the Tuggerah Formation bedrock.

A shallow permanent groundwater table maybe encountered within the central, lower area of the site, along the unnamed creek and also along Mannering Creek. Saturated surface soils were noted in these areas during the site walkovers.

The DWE mapping of groundwater vulnerability has not been published for the Wyee area however based on mapping for the Gosford region the vulnerability risk is likely to include areas considered to have moderate to high risk to be adversely affected by human activity. No ground water modelling for the area is known to be available and therefore no estimates of movement of groundwater are available. This is an issue that will require further detailed investigation as part of the urban development studies when the layout of the development being prepared. However at this stage there is no information that suggests that the expected impact of urban development on the groundwater could not be managed.

Most of the existing site has the capacity to accept rainwater which may eventually result in recharge of the groundwater system. Residential development is likely to cover a proportion of this recharge area with impervious surfaces (estimated as up to 55% overall) and other areas that were not vegetated or poorly vegetated will be revegetated. It is expected that all surface runoff from the impervious areas will be directed back into the creek system and eventually reaching the Lake at the eastern edge of the study area.

To more closely maintain the existing balance of recharge across the site consideration could be given to either:

- temporarily storing and directly infiltrating roof water from residential buildings, or
- providing a number of gravel filled drains radiating from the Lake across the site.

The overlying clay soil across the site is recorded as up to 4 metres thick and would be expected to limit the risk of direct contamination of the ground water. Despite this, a precautionary principle should be applied to any development proposal pending more detailed studies.

A search for registered groundwater bores in the Department of Water and Energy (DWE) (now DECCW) groundwater bore database indicated that there was one registered bore located within a 1.0 km radius of the site. The bore is located approximately 500 m to the east of the site boundary.

5.1.4 Weak Soils

A number of test bores located generally within the lower northern area of the site and around the existing creeks encountered weak soils, including firm clay and loose sand.

The majority of these weak soils coincided with the wetter areas of the site along the unnamed creek and in the north-eastern corner. (Further investigation was undertaken in those areas of weak soils to the west of the unnamed tributary of Mannering Creek by Douglas Partners in April 2010 (**Appendix 4A**). During this investigation, the area affected by weak soils was greatly reduced, possibly due to the field work being undertaken after a period of prolonged dry weather. A number of pits located generally within the lower northern area of the site encountered firm clay and loose sand.

The areas of surface moisture and weak near surface soils, encountered during both the 2010 and 2009 investigation may be as a result of natural springs along the western side of the unnamed creek.

Development of these weak areas for residential subdivision is considered to be feasible from a geotechnical viewpoint provided appropriate drainage is installed to prevent build up of moisture content in the near surface soils to allow site improvement measures to be undertaken. It will be necessary to remove these weaker soils and either replace them with select engineered filling or moisture re-conditioned excavated soils.

Regardless of the ground improvement measures adopted at the site, it will be of critical importance to address site drainage, surface water and subsoil seepage flows before commencing construction.)

5.1.5 Acid Sulfate Soils

Review of the acid sulfate soil screening results indicated that the soils would generally not be considered to be potential or actual acid sulphate soils. This conclusion is consistent with the acid sulfate soil risk mapping and site surface elevations.

Further testing was undertaken in those areas identified as comprising weak soils in April 2010 (**Appendix 4A**). The results indicate that acid sulfate soils are not present within this area.

Bulk excavation to the depths of investigation could be undertaken without the need for an acid sulphate soil management plan.

5.1.6 Slope Stability

No evidence of hill slope instability (landslip) was observed within the site. Other than erosion-triggered localised slumping from the low height banks of Mannering Creek and tributary, there did not appear to be a significant risk of stream bank instability.

It is considered that hill slope and stream bank instability do not impose significant constraints on the proposed site development.

5.1.7 Erosion Potential

Erosion hazard typically forms a limitation for the Gorokan Landscape. The results of the Emerson Class Dispersion testing indicated that the soils from the higher portions of the site, mapped as being of the Gorokan Soil Landscape Group showed slight susceptibility to dispersion. Combined with the absence of saline soil conditions, the erosion hazard of these soils within the majority of the site is deemed to be moderate.

The soils along the alignment of the Mannering Creek and the unnamed creek are mapped as being of the Wyong Soil Landscape Group. Soils of this group are typically of moderate erodibility. Erosion within this soil is not anticipated with the exception of severe stream bank erosion along major drainage channels. This is supported by the evidence of previous erosion within the existing creek lines within the site. It is considered that the erosion hazard within the areas proposed for residential would be within usually accepted limits which could be managed by good engineering and land management practices.

5.1.8 Soil Salinity

Based on the site inspection and results of laboratory testing, the majority of the site appears to be non-saline.

5.1.9 Mine Subsidence

Discussion with the Mine Subsidence Board revealed that the site lies outside a mine subsidence district and holds no interest to the Mine Subsidence Board.

5.1.10 Filling

Filling mounds and platforms were observed within the north-western area of the site. Minor filling may also be present within the areas of previous development at the site, including the northern Area B and also within the "paper subdivision" along the eastern boundary of the site. A filling platform of approximately 2m in height was observed within the north-eastern corner of the site, adjacent to Gorokan Road. No subsurface investigation was undertaken within these areas during the preliminary investigation.

Further assessment would be required to assess the suitability of the filling to either remain in place or for re-use as engineered filling elsewhere on site.

5.1.11 Contamination

A preliminary (Phase 1) contamination assessment was conducted over the site. A review of Section 149 (2) certificates, land title records and WorkCover licence records for the storage of Dangerous Goods, including underground storage tanks, was not undertaken at this stage of the assessment given the number of properties involved and the scope of work accepted by Lake Macquarie City Council.

There are no Regulatory Notices issued for the site under either the Contaminated Land Management (CLM) Act 1997 or Section 55 of the Protection of the Environment Operations (POEO) Act 1997.

Site investigations and a site history review indicated that the site had been used primarily for rural, intensive agricultural and residential purposes, although extractive land uses (quarrying) were identified in two areas on the site. Uses included orchards, poultry farming and market gardening, which may have resulted in contamination. More localised areas of potential contamination were also identified; these included illegal dumping, workshop facilities, refuelling infrastructure and placement filling. The widespread and more significant localised Areas of Environmental Concern (AEC) are identified in Figure 5-1.

Many of the buildings observed on-site were noted to be at least in part constructed from fibreboard which may have resulted in asbestos contamination. Further it is also noted that areas in the vicinity of past or present development can be expected to have isolated areas of filling or disturbance. Areas of filling or disturbance typically indicate a low potential for contamination.

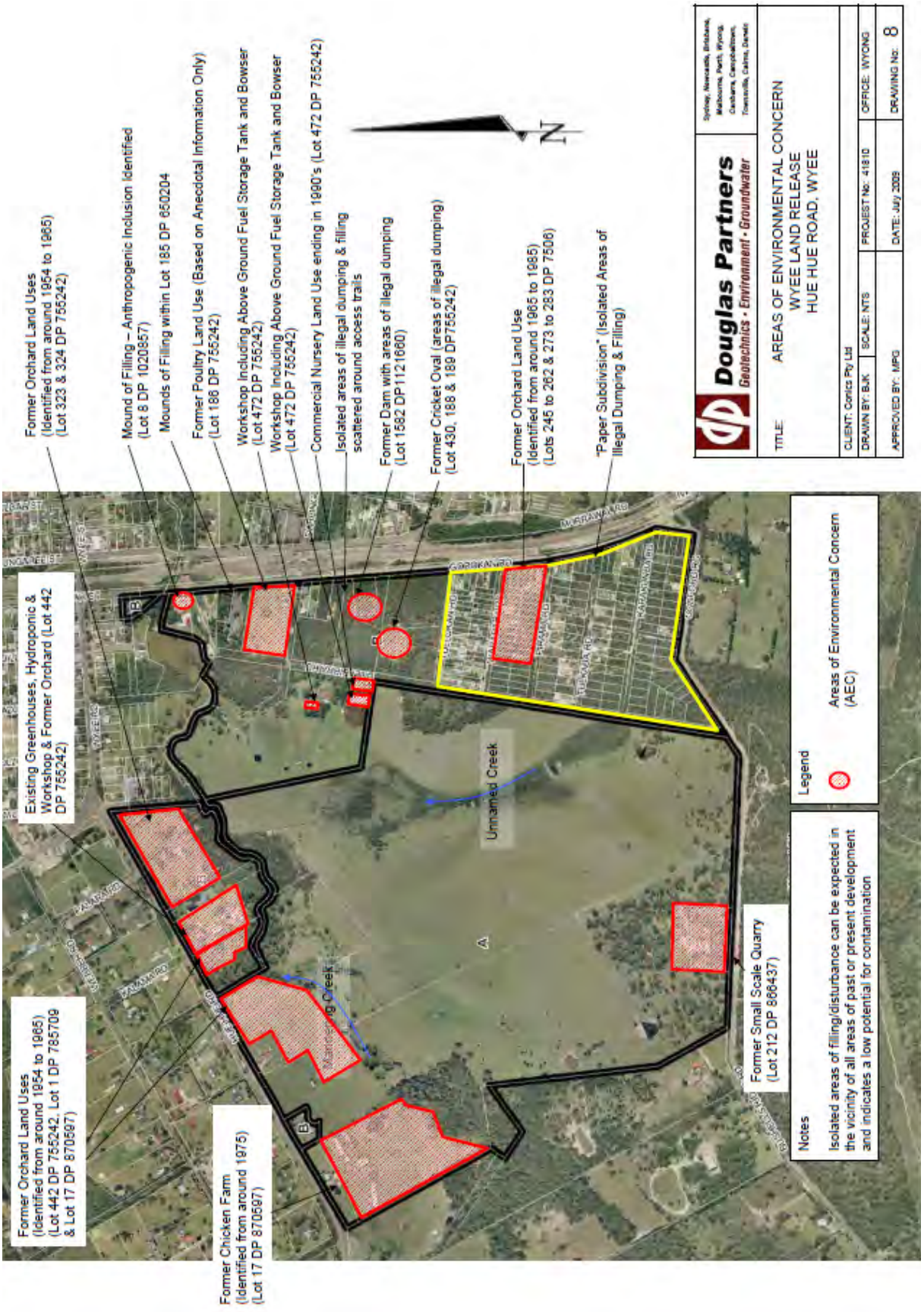


Figure 5-1: Areas of Environmental Concern (geotechnical and contamination)

Based on the findings of the desktop review and detailed site walkover, the principal sources of potential contamination within the site are presented in Table 5-1 below.

Table 5-1: Potential Contamination Sources

Lot	Potential Contamination Source/Activity	Potential For Contamination	Primary Potential Contaminates of Concern
Lot 212 DP866437	Quarrying Activities	Low (Soil & Groundwater)	Heavy Metals, TPH, BTEX, PAH & Phenols
Lots 245 to 262 & 273 to 283 DP 7506	Orchard Activities	Low(Soil)	Heavy Metals & OCP
Lot 430, 188 & 189 DP 755242	Illegal Dumping	Moderate (Soil)	Heavy Metals, OCP, TPH, BTEX, PAH, Phenols, PCB, Cyanide Asbestos & Sulphate
Lot 1582 DP1121660	Quarrying Activities	Low (Soil & Groundwater)	Heavy Metals, TPH, BTEX, PAH & Phenols
	Illegal Dumping	Moderate to High (Soil & Groundwater)	Heavy Metals, OCP, TPH, BTEX, PAH, Phenols, PCB, Cyanide Asbestos & Sulphate
Lot 186 DP 755242	Poultry Activities	Low (Soil & Groundwater)	Heavy Metals, OCP, Nutrients & Microbiological
Lot 472 DP 755242	Machinery Workshops, Storage Areas & Refuelling Infrastructure	Low to Moderate (Soil & Groundwater)	Heavy Metals, TPH, BTEX, PAH & Phenols
	Nursery Activities	Low to Moderate (Soil)	Heavy Metals, OCP, OPP & Cyanide
Lot 8 DP 1020857	Importation of Filling	Low to Moderate (Soil)	Heavy Metals, OCP, TPH, BTEX, PAH, PCB & Asbestos
Lot 323 & 324 DP 755242	Orchard Activities	Low(Soil)	Heavy Metals & OCP
	Importation of Filling (or Deleterious Materials)	Low to Moderate (Soil)	Heavy Metals, OCP, TPH, BTEX, PAH, PCB & Asbestos
Lot 442 & 443 DP 755242	Orchard Activities	Low (Soil)	Heavy Metals & OCP
Lot 442 DP 755242	Market Gardens (Hydroponics)	Low to Moderate (Soil)	Heavy Metals, OCP, OPP & Cyanide

	Workshop	Low to Moderate (Soil & Groundwater)	Heavy Metals, TPH, BTEX, PAH & Phenols
Lot 1 DP 785709	Orchard Activities	Low (Soil)	Heavy Metals & OCP
Lot 17 DP 870597	Orchard Activities	Low (Soil)	Heavy Metals & OCP
	Poultry Activities	Low (Soil & Groundwater)	Heavy Metals, OCP, Nutrients & Microbiological

Notes:
Heavy Metals = Arsenic, Cadmium, Chromium, Copper, Lead, Mercury, Nickel & Zinc
TPH = Total Petroleum Hydrocarbons, BTEX = Benzene, Toluene, Ethyl Benzene & Xylene
PAH = Polyaromatic Hydrocarbons, PCB = Polychlorinated Biphenyls
OCP = Organochlorine Pesticides, OPP = Organophosphorus Pesticides
Nutrients = Nitrogen, Phosphorus and Ammonia
Microbiological = Faecal Coliforms and E-Coli

The potential for off site sources of contamination were generally considered not to be significant based on the following factors:

- Surrounding land uses are generally semi-rural residential with the exception of the Main Northern Railway and areas to the north east and east.
- Historical land uses adjacent to the site were not identified as potentially contaminating. The walkover assessment identified various potential sources of asbestos contamination to the surface soils, filling or waste disposal areas on-site.

In summary, soil contamination risk across the site is generally low. A range of further investigations will be required to assess the actual degree of contamination present on the site at development application stage, however it is unlikely that contamination will present a constraint to development.

5.2 Water & Hydrology

A Water Management Study was undertaken over the study area by Cardno, which analysed issues in relation to flooding, stormwater management and groundwater (**Appendix 6**).

5.2.1 Hydrology

The Mannering Creek catchment upstream of Wyee Road has been estimated as 1273ha. There is a lake of unknown depth located in the north eastern corner of the study area that is fed by flows from both Mannering Creek and a local tributary entering from the south. Elsewhere the land has been cleared for agricultural purposes.

Peak flows were estimated at various locations throughout the catchment for both the 20 year ARI and the 100 year ARI. 100 Year ARI peak flows across the site range from 126 m^3/s to 141 m^3/s, while for the 20 Year ARI, flows are between 92.4 m^3/s to 102.7 m^3/s.

5.2.2 Flood Extent

The site is affected by the 100 year Annual Recurrence Interval (ARI) flood. The estimated extent of 100 year ARI flooding for the existing catchment land use is shown in Figure 5-2.

The flood extent over the site following urban development has also been estimated. There would be minor increases in the 100 year flood level as a result of urban development, as illustrated in Figure 5-3 below.

5.2.3 Riparian Corridor

The estimated 100 Year flood extent along Mannering Creek is in excess of 144m. This area (bounded by the green line in Figure 5-4 and Figure 5-5) is considered unsuitable for urban building development and should be set aside as an open space or conservation area.

Under the guidelines for controlled activities along Riparian Corridors (NSW Government, February 2008) the minimum riparian corridor width along Mannering Creek is 40m, comprising a minimum 20m core riparian zone plus a 10m vegetated buffer on each side of the CRZ. However the 100 year flood extent is generally more than 40m wide and where land is below the 100 year flood level and more than 20m from the centre of the creek it is considered unsuitable for housing unless the land is filled. However land below the 100 year flood level and more than 20m from the centre of Mannering Creek could potentially be used for sports fields or other recreation uses.

Potential Landfill

The set back and developable area shown in Figure 5-4 assumes that there would be no landfill for areas currently estimated to be below the 100 year flood. In consideration of flood risk management issues only it is considered feasible to increase the area available for urban development. On the far western side of the site, land in the vicinity of the farm dams could be filled and the runoff from these areas conveyed to Mannering Creek via a system of pipes and swale drains. The drainage lines in this locality are ephemeral, wide, and shallow (approximately 400mm to 500mm deep). Therefore depending upon whether there are other limiting constraints (eg ecological), some landfill that includes the farm dams may be feasible (Figure 5-5).

The set back shown in Figure 5-4 along the tributary of Mannering Creek is based on a no landfill scenario, however in the southern half of the Site, the 100 year flood extent based on existing topography is estimated as almost 50m wide and in excess of the total minimum 30m required for under the guidelines for controlled activities along Riparian Corridors (NSW Government, February 2008).

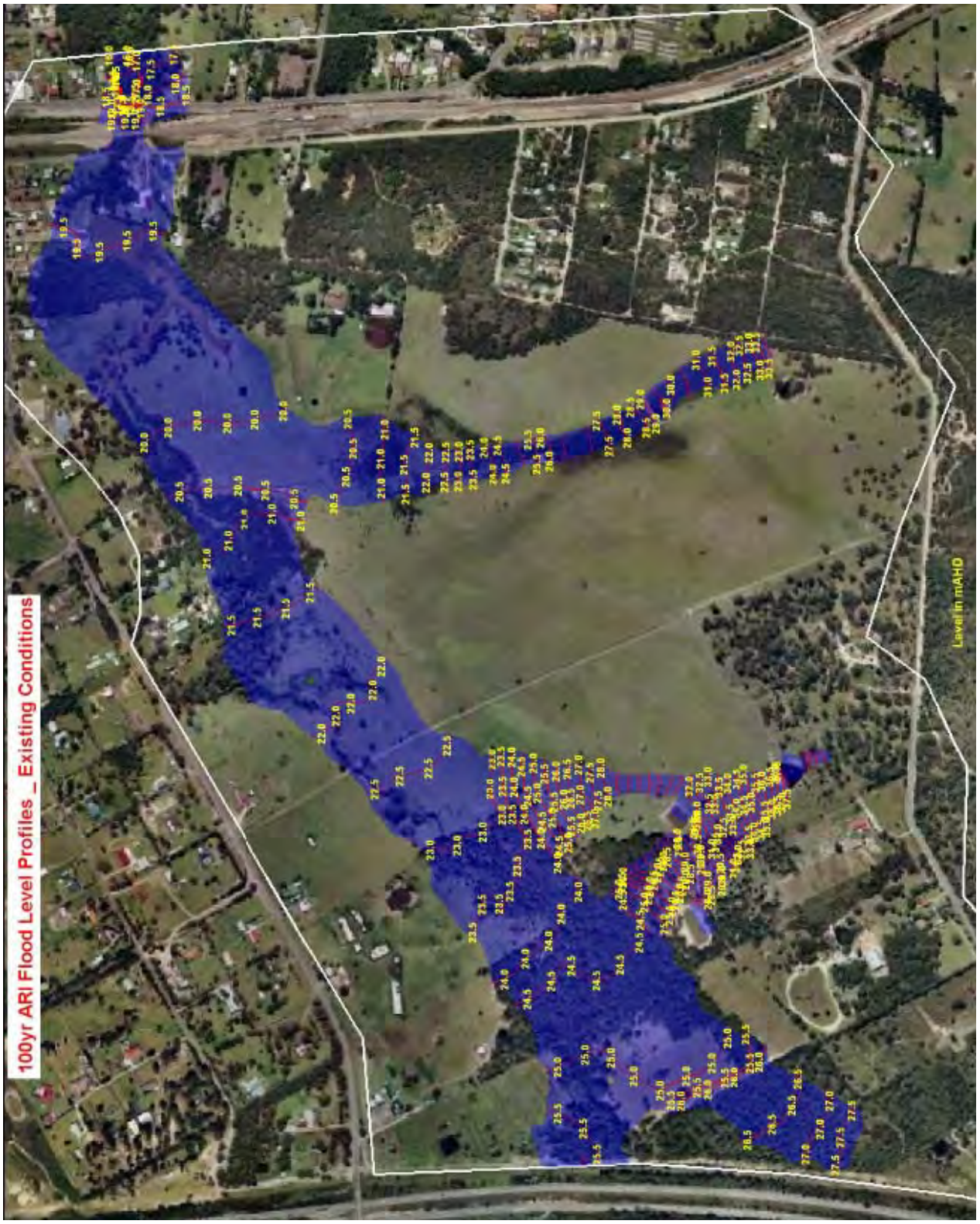


Figure 5-2: Existing 100 Year Annual Recurrence Interval (ARI)

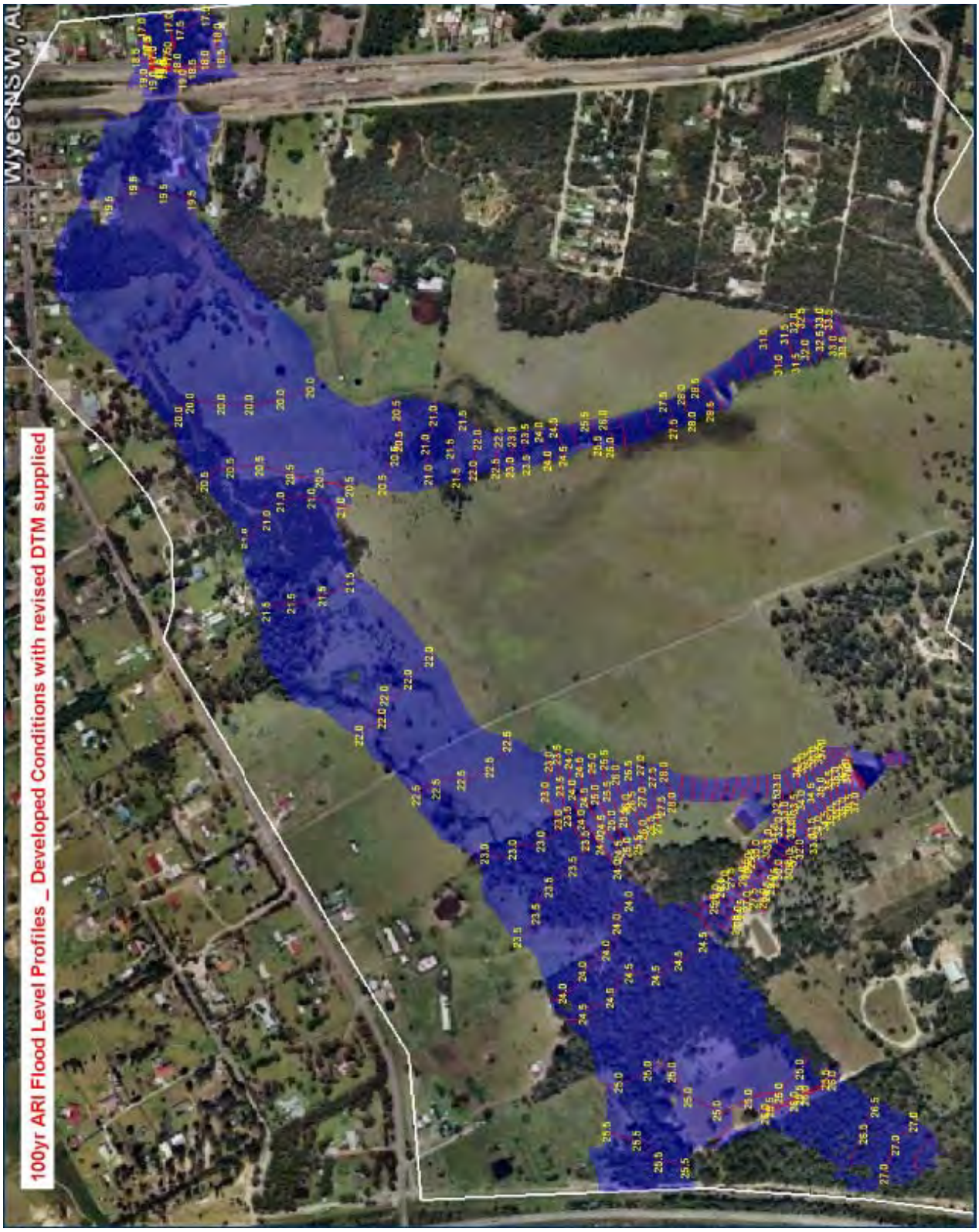


Figure 5-3: Estimated future 100 Year Annual Recurrence Interval (ARI)

The tributary channel varies in depth from approximately 0.5m near the upstream (southern boundary of the Site) to approximately 1.4m opposite Waropara Road. It is not considered appropriate to fill this tributary and replace it with an under ground drainage system but landfill up to the limit as shown in Figure 5-5 is possible.

There are three islands of ground estimated to be above the 100 year ARI flood level within the proposed riparian zone. Two of the islands, one of which is outside the study area, are very small and should be included within the riparian zone regardless of the ground level. The third larger island covers an area of 1.82ha of which 1.44ha lies within the study area. It is separated by a corridor of lower ground approximately 30m wide. The narrow corridor is cleared land covered by pasture grasses and forms part of a tributary of Mannering Creek. As such it may be feasible to undertake earthworks to provide a land bridge to the island, which subject to other constraints, may be suitable for urban development.

The estimated 100 year ARI flood extent along the south eastern tributary of Mannering Creek is approximately 45m wide in the upper and middle reaches. A riparian corridor of 45m would satisfy a 20m setback as defined in the NSW DECCW riparian policy.

5.2.4 Water Quality

The water management study estimated the existing and future quality of surface runoff on the site for 3 years representing a wet year, a dry year and a year of average total rainfall.

The results revealed that Total Nitrogen, Total Phosphorus and suspended solids would all increase as a result of development on the site. The estimated increase in pollutant loads assumes that no catchment management controls are implemented. The judicious selection of water sensitive urban design measures would allow the mitigation of the pollutants.

Appropriate options for water quality treatment systems have been investigated for the site. These are detailed in the report in **Appendix 6**. Typically the measures would include local or regional water quality ponds, wetlands or biofilters. Alternatively, devices such as Ecosol© traps or CDS© units could be employed in parts of the site depending upon the ultimate land use and building development density.

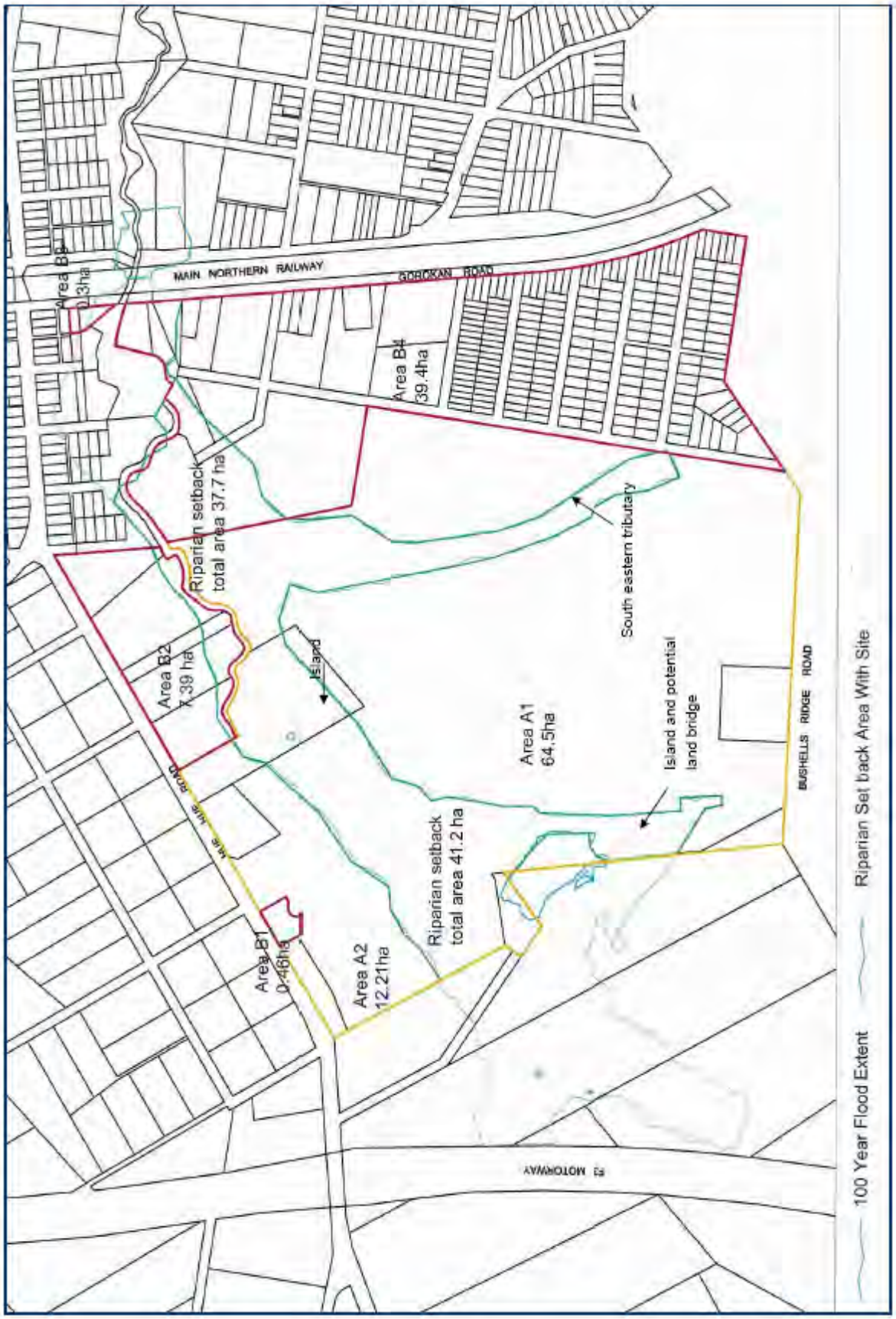


Figure 5-4: Estimated 100 Year ARI and Proposed Riparian Setback

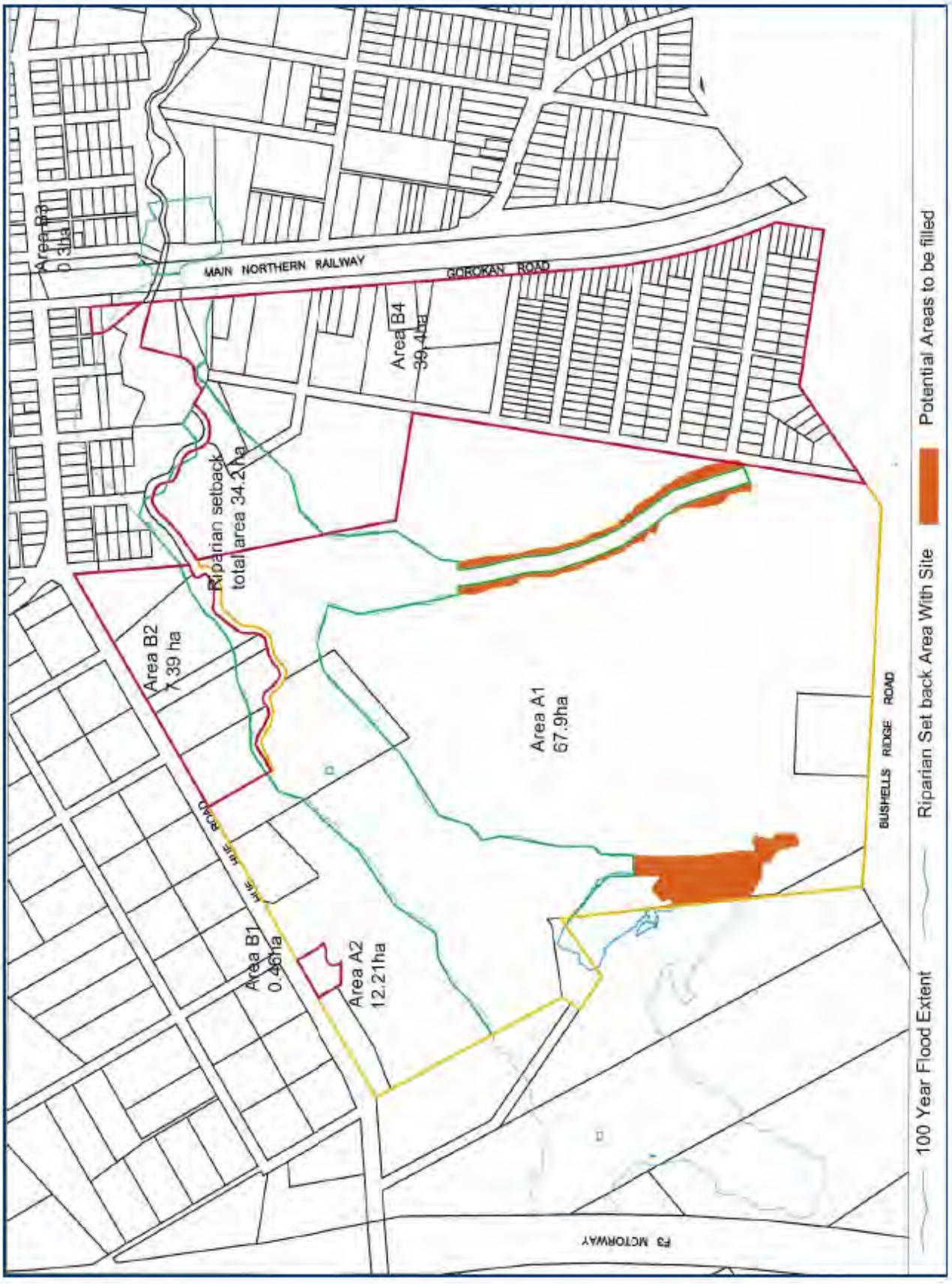


Figure 5-5: Estimated 100 Year ARI with Filling

5.2.5 Stormwater Management

There are various management practices which may be suitable for the management of stormwater quantity on the site, as follows:

On-Site Retention or Detention
Detention policies require that any extra runoff generated by new developments or redevelopments be temporarily stored within the site and released at a controlled rate. The allowable rate of discharge is set so that there is no increase in flood flows in all storms up to and including the 100 year ARI flood at all downstream locations.

Detention Basins
Detention basins temporarily store stormwater runoff and release it into the downstream drainage system at a controlled rate to reduce the peak flow in the downstream system. Opportunities to upgrade the existing Lake by modifying the embankment could be considered as an option to reduce any adverse impacts on flood risk to downstream development.

Infiltration Basins
Infiltration basins capture stormwater runoff and release it into the groundwater system thereby decreasing the volume of site runoff and the peak flow in the downstream system. This system could be acceptable where sandy soils are found close to the surface.

Floodways/Engineered Waterways
Floodways/engineered waterways could be constructed to collect and convey stormwater runoff from the development areas to the existing creek – gully system. Engineered waterways can provide attractive urban landscape features and also offer benefits in terms of economy, land enhancement, recreation and pollution control through an ability to intercept substantial quantities of suspended materials which would otherwise be discharged to lakes and streams.

In addition, a wide range of structural measures are available to capture gross pollutants. These have been discussed in the water management report.

5.3 Ecological Assessment

A Biodiversity Study was undertaken over the subject site by Eco Logical Australia (**Appendix 3**). The study reviewed existing information including regional biodiversity strategies, local studies such as the Wyee Ecological Attributes Study and Wyee Squirrel Glider Study, a previous ecological study undertaken by Travers Environmental (2008) on Area A and routine flora and fauna databases such as Atlas for Wildlife and BioNet.

In addition, field surveys were undertaken in accordance with the Lake Macquarie City Council Flora and Fauna Survey Guidelines (LMCC 2001). Thorough field investigations, including vegetation community validation, vegetation surveys, targeted threatened flora

searches, hollow-bearing tree surveys, diurnal bird surveys, Elliot and cage trapping, harp trapping, Anabat, call playback, spotlighting, koala scat searches, threatened bird surveys and opportunistic observations, were employed in Area B of the study area.

Six vegetation communities were identified within the study area, including two EEC's: *freshwater wetland on coastal floodplains* and *swamp sclerophyll forest on coastal floodplain.* Two threatened flora species were identified: *Teratheca juncea* and *Angophora inopina*. In addition, 153 flora species including 25 exotic species, and 68 fauna species including 6 exotic species were identified on the site.

A total of six threatened fauna species were recorded within the study area: Glossy Black Cockatoo, Squirrel Glider, Eastern Free-tail Bat, Grey-headed Flying Fox, Little Bent-wing Bat and the Large Eared Pied Bat. A further 27 additional threatened species are considered likely to occur based on local occurrence and known habitat requirements. These include Powerful Owl, Masked Owl, Spotted-tailed Quoll, East Coast Freetail Bat and Eastern Bent-wing Bat.

The study area contains a range of habitat resources for these threatened species including foraging, roosting and nesting resources.

5.3.1 Corridors

A number of corridors have been identified over the subject site (Figure 5-6). These include Mannering Creek Riparian Corridor, Regional Wildlife Pathway (on western edge of site) and several corridors of remnant native vegetation and partially cleared native vegetation.

5.3.2 Ecological Constraints Assessment

Based on the findings of the ecological assessment, an ecological constraints map was prepared identifying areas of low, moderate and high constraint over the site (Figure 5-7). Areas of high constraint should be the focus of conservation on the site, as they provide for the retention of threatened species habitat and align with identified local and regional corridors. They serve to achieve the requirements of the Lake Macquarie City Council's *Biodiversity Planning Policy and Guidelines for LEP Rezoning Proposals*.

Areas of moderate constraint are identified as they would provide a valuable addition to the conservation footprint, though are in addition to the requirements of Council's biodiversity planning policy.

Areas of low constraint have low biodiversity value and should be the areas focussed on for development.

In accordance with the principles of improve or maintain, the approach to development within areas of high or moderate constraint is firstly to avoid, then mitigate and as a last resort offset the impacts of development through an appropriate offset strategy.

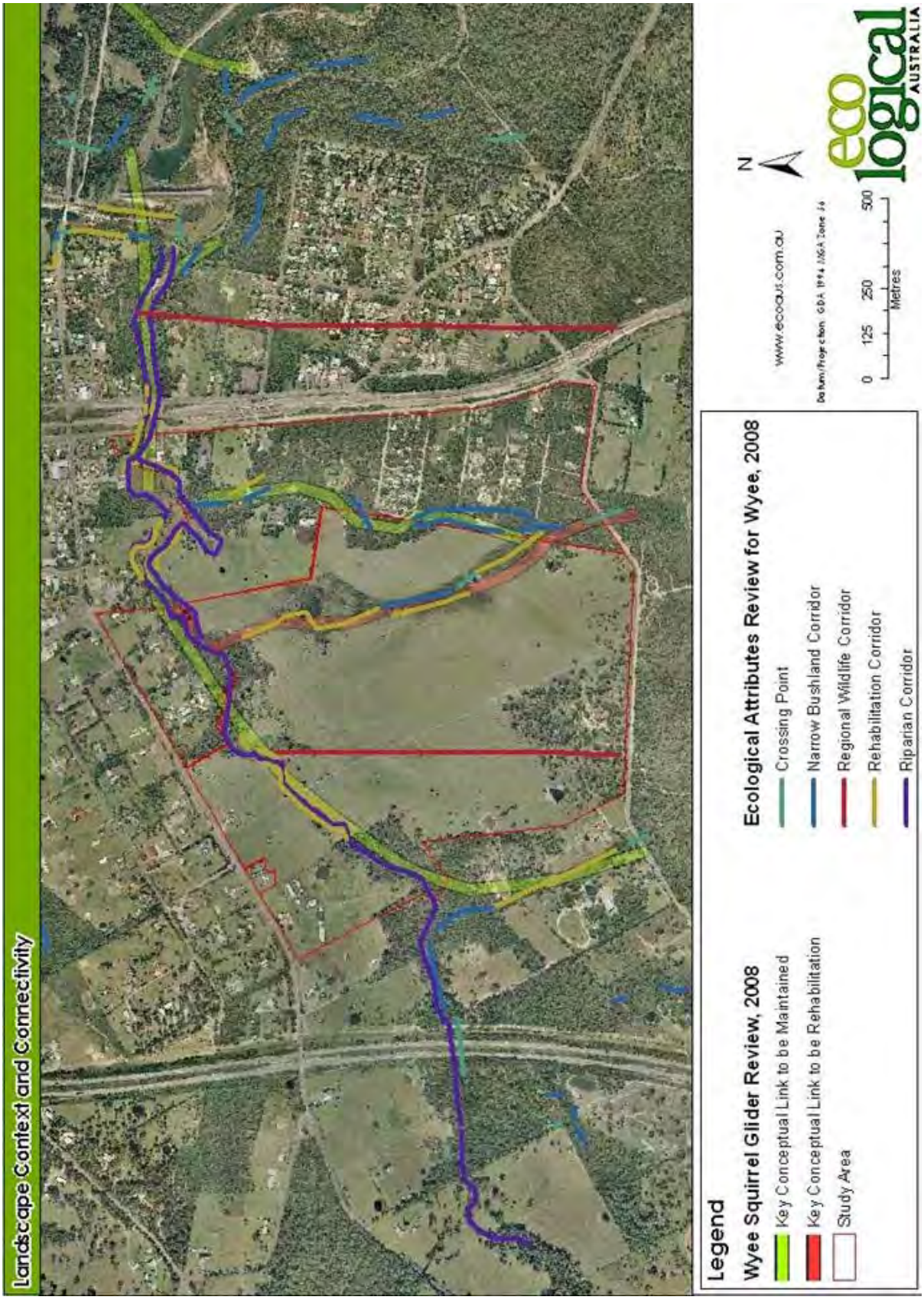
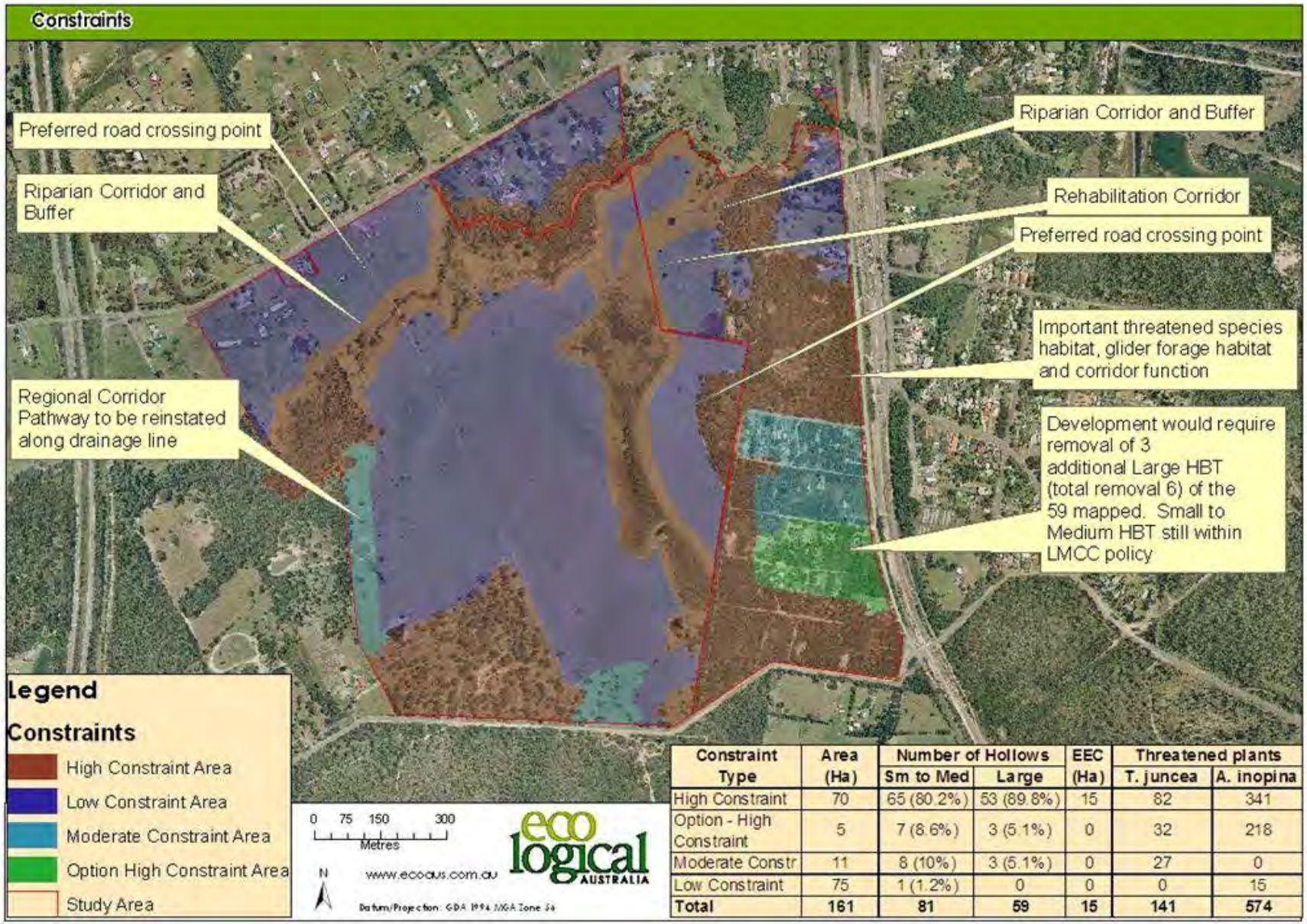


Figure 5-6: Wildlife Corridors



Constraint Type	Area (Ha)	Number of Hollows		EEC (Ha)	Threatened plants	
		Sm to Med	Large		T. juncea	A. inopina
High Constraint	70	65 (80.2%)	53 (89.8%)	15	82	341
Option - High Constraint	5	7 (8.6%)	3 (5.1%)	0	32	218
Moderate Constr	11	8 (10%)	3 (5.1%)	0	27	0
Low Constraint	75	1 (1.2%)	0	0	0	15
Total	**161**	**81**	**59**	**15**	**141**	**574**

Figure 5-7: Ecological Constraints

5.4 Bushfire Hazard Assessment

Approximately half of the study area is mapped as Bush Fire Prone Land by Lake Macquarie Council, as illustrated in Figure 5-8. A bushfire study has been undertaken over the site by Eco Logical (**Appendix 7**).

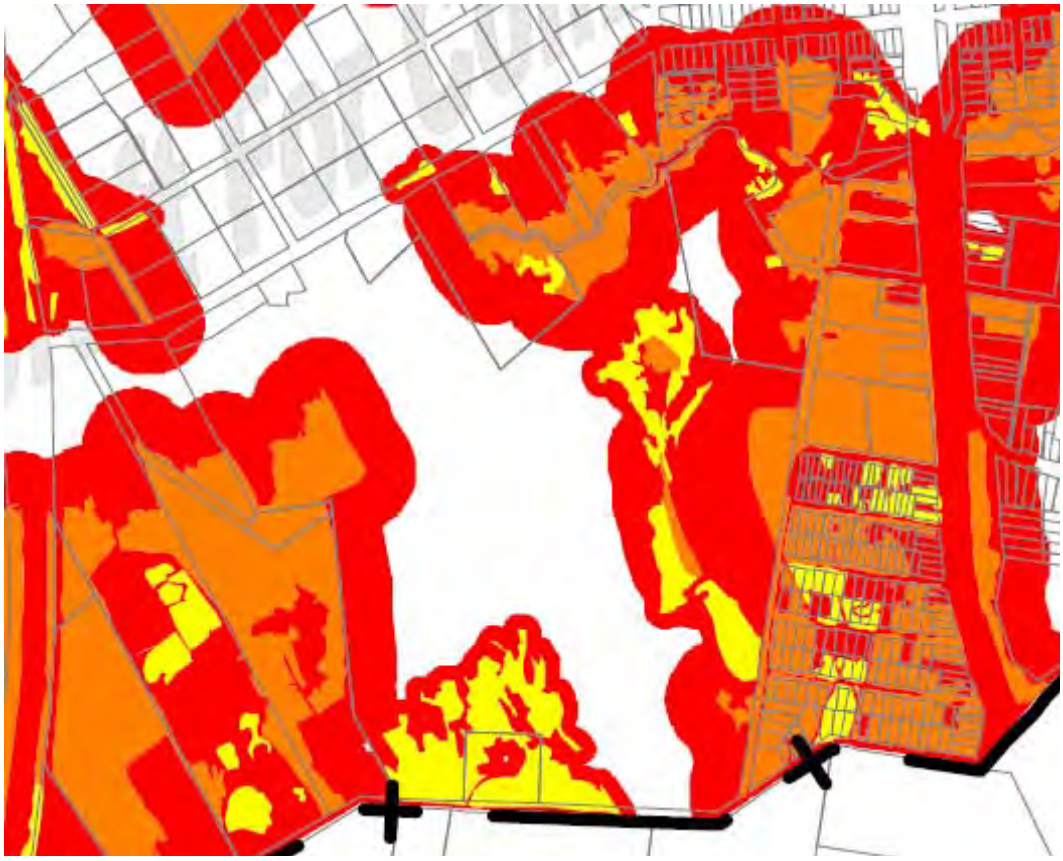


Figure 5-8: Bushfire Prone Land Map (Lake Macquarie City Council)

The Lake Macquarie LGA has a high incidence of bushfire and major bushfire events have affected the general locality of the study area in recent decades. Extensive areas of bush fire prone land are located in the vicinity of the study area including bushland on both public and private lands. The bushland patterns in the locality mean that bushfire attack could come from any direction, but is most likely from a sector running from north through west to southwest. The bushfire risk in the study area is not expected to be reduced significantly in future years e.g. through clearing of the hazard.

5.4.1 Vegetation

Much of the bush fire prone vegetation within the study locality has been subject to varying levels of past disturbance, including clearing for paddocks, vehicle tracks and unauthorised residential development in the way of sheds and small houses.

There are three major bush fire prone vegetation types present on or adjacent the study area – forest, freshwater wetland and forested wetland. There are some riparian areas of freshwater and forested wetland that may be considered 'low hazard vegetation'

consistent with that described as riparian vegetation in *Planning for Bushfire Protection (PBP)* depending on the extent of any future revegetation.

5.4.2 Slope

The effective slopes on the site are classified within five slope classes, one being upslope and four being downslope. The study area slopes gently downward from south to north, with effective slopes across and adjacent the study area within the PBP slope categories of 'downslope >0 - 5 degrees' and 'flat-upslope'.

5.4.3 Constraints

The major bushfire protection constraint is the provision of Asset Protection Zones (APZs) around areas of vegetation within and adjacent the study area. The bushfire assessment has identified APZs from the existing vegetation to give an indication of the likely size of APZs required to protect future development. These range from 10 m to 25 m wide within the study area, however, across the majority of the site careful design of future development will accommodate the required APZs. Exact locations and sizes of APZs required for any future development would need to be determined, once a lot layout has been finalised. This should be undertaken as part of the master planning process for the subject land.

Any proposed revegetation within the study area will require careful planning to ensure that the bushfire risk to existing buildings within and adjacent the study area is not negatively impacted particularly in relation to provision of adequate APZs.

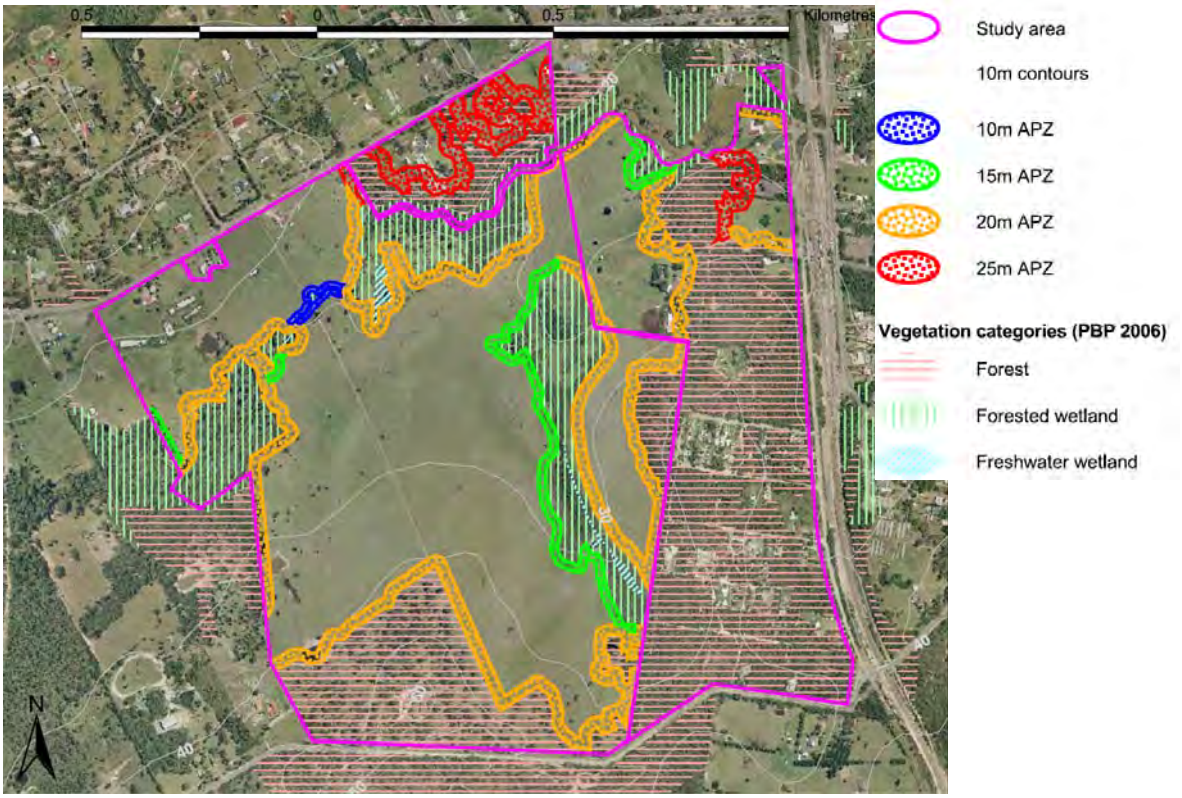


Figure 5-9: Indicative Asset Protection Zones for future development

5.5 Visual Amenity

A visual impact assessment (**Appendix 8**) has been prepared over the site to identity key landscape features and recommend measures to protect the landscape quality of the locality. The report has been prepared in accordance with the Lake Macquarie *Scenic Quality Guidelines 2004*.

5.5.1 Existing & Proposed Land Uses

The majority of development within the vicinity (i.e. 1km) of the property boundary comprises low density residential development, rural land uses and some commercial development associated with the Wyee township. Table 5-2 provides an overview of existing developments within 1km of the site boundary.

Table 5-2: Surrounding development

	Existing Development
North	Rural residential/rural development and associated structures Bethshan Retirement Village, Convention & Christian Centre and cemetery Wyee town centre, comprising retail stores and other businesses Wyee Nursery and Landscape Centre
West	Agricultural land, with a number of houses and ancillary structures
East	Low density residential development associated with the Wyee township
South	Vacant bushland

Advice received from Lake Macquarie Council on 12 October 2010 indicated that within 1km of the site boundary, there were no major rezoning or development applications.

It is understood that there is a proposed industrial development to the south of the paper subdivision, in Wyong Shire. It has a gross area of approximately 19ha.

5.5.2 Existing Landscape

The visual analysis diagram (Figure 5-10) illustrates the landscape features associated with the site.

The site consists of mostly cleared pastoral land with rural development along the edge of Hue Hue road, Gorokan and Bushells Ridge Road.

The rural development along Gorokan Road consists of the paper subdivision of unapproved dwellings. The railway transport corridor and train station to the east is visually prominent from the edge of the site.

The site topography indicates a low lying basin and natural drainage corridor running west to east and is flanked by Hue Hue Road and Bushells Ridge Road. A natural vegetated creekline also bisects the site between the rising landform to Bushells Ridge Road and Gorokan Road. Some sections of these corridors have been heavily disturbed and cleared.

The elevated area along Hue Hue Road allows prominent views into and over the site. These unobstructed views comprise rural residential development and natural to modified vegetation, towards cleared pasture land with a forested backdrop. Views to the forested range to the north of the site are possible through visual breaks within the existing rural development.

The elevated area along Bushells Ridge Road has partial panoramic and filtered views of the study site through gaps in vegetation through to the distant forested range.

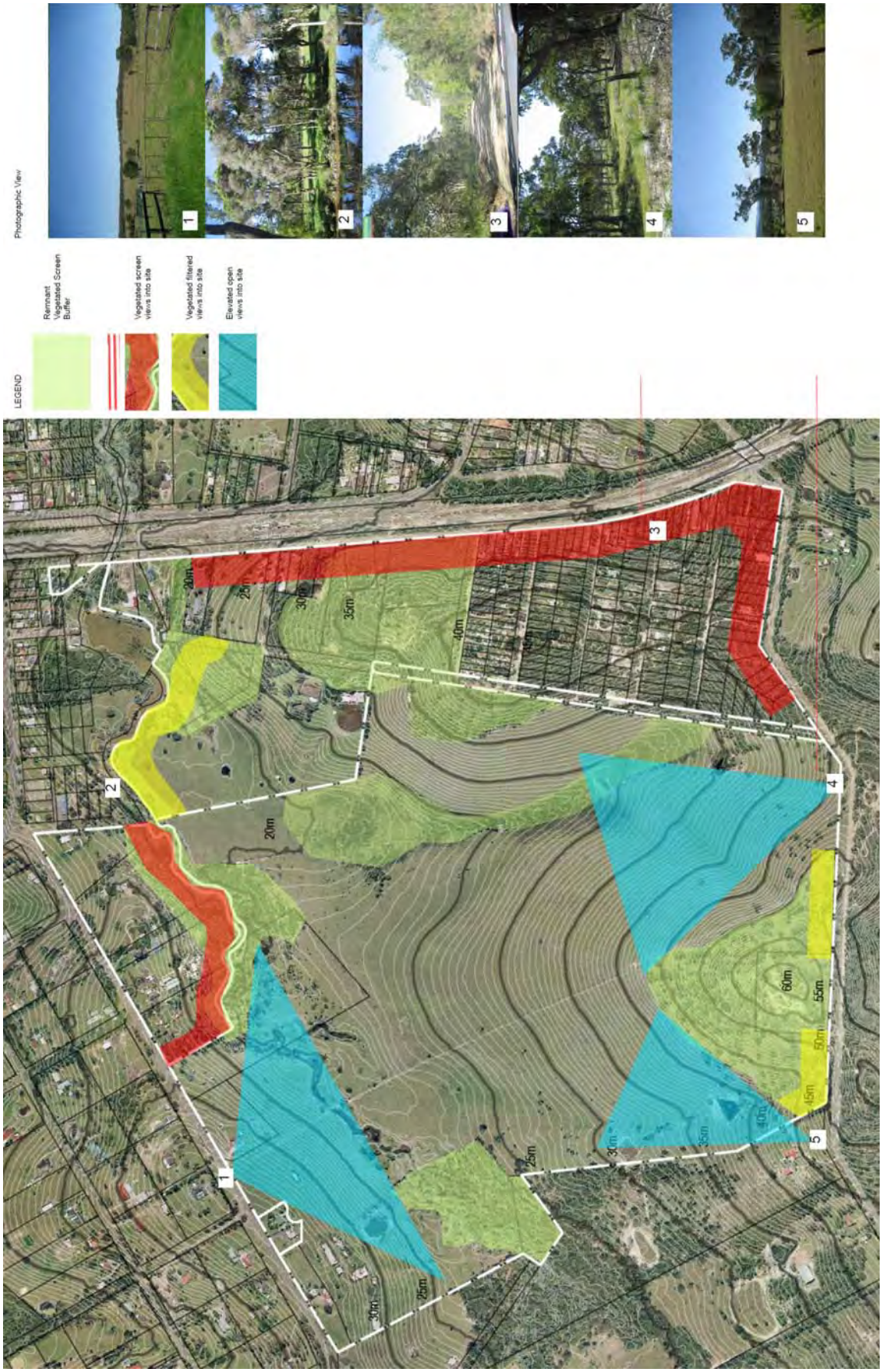


Figure 5-10: Visual Analysis Diagram

5.5.3 Visual Impact Assessment

The visual assessment is based on Lake Macquarie Scenic Quality Guidelines 2004 by assigning values to landscapes through aesthetic and scenic qualities. These scenic qualities are defined through:

1. Landscape Setting Units (Rating – low, moderate and high)
2. Significant Features, Viewing Points and Ridgelines (not applicable in this study)
3. Visual Accessibility (Rating – low, moderate and high viewing level)

These values are overlaid to derive Scenic Management Zones ranging from highest rating A to lowest rating D.

Landscape Setting Units
Three landscape units identified within the study site are based in urban development, vegetation and topography.

Swamp Sclerophyll Forest
This unit is located along the low lying areas of the site basin. The unit is established along Mannering Creek to the northern extent of the site and the vegetated drainage corridor behind the paper subdivision. This unit consists of mixed vegetated communities and is moderately textured. The unit has a moderate visual quality generally throughout the site. The vegetation surrounding Mannering Creek to the rear of the existing community centre exhibits a moderate to high level of quality.

Eucalypt Forest
This unit is located to west of Mannering Creek and on the southern and eastern fringes of the study area. This western and eastern forest unit has a moderate visual quality within the development site. The southern forest unit consists of partially disturbed Eucalypt forest along Bushells Ridge Road, with higher amenity woodland character when viewed from the elevated position of the study site perimeter.

Cleared/Uncleared Urban and Rural Land
This unit describes the areas of the site that are cleared for rural production, urban and rural living. This unit covers the majority of the study site. Urban subdivision development can be found along Hue Hue Road and to the northeast of Gorokan Road. Low level urban dwelling development existing within the vegetated/partial cleared paper subdivision along Gorokan Road and to the southeast area of Bushells Ridge Road. Vegetation has been removed or greatly modified.

This unit has low visual quality due to the lack of streetscape amenity and built character within areas of Hue Hue Road and Gorokan Road.

Visual Accessibility
Areas of the site identified being relatively visible and sensitive to change are:

- **Hue Hue Road - Level 2 - Moderate Viewing Level**: Hue Hue Road is a secondary sealed road along the northern end of the study site with prominent views into the site.
- **Gorokan Road – Level 3 – Low Viewing Level**: Gorokan Road is a secondary unsealed road east of the sight flanked by the railway transport corridor and forested paper subdivision with limited views.
- **Bushells Ridge Road – Level 3 – Low Viewing Level**: Bushells Ridge Road is a secondary unsealed road along the southern edge of the study site with prominent views into the site from certain locations.

5.5.4 Scenic Management Zone

The site has been categorised as consisting of either Scenic Management Zone C or D, in accordance with the *Scenic Quality Guidelines 2004*. This is illustrated in Figure 5-11.

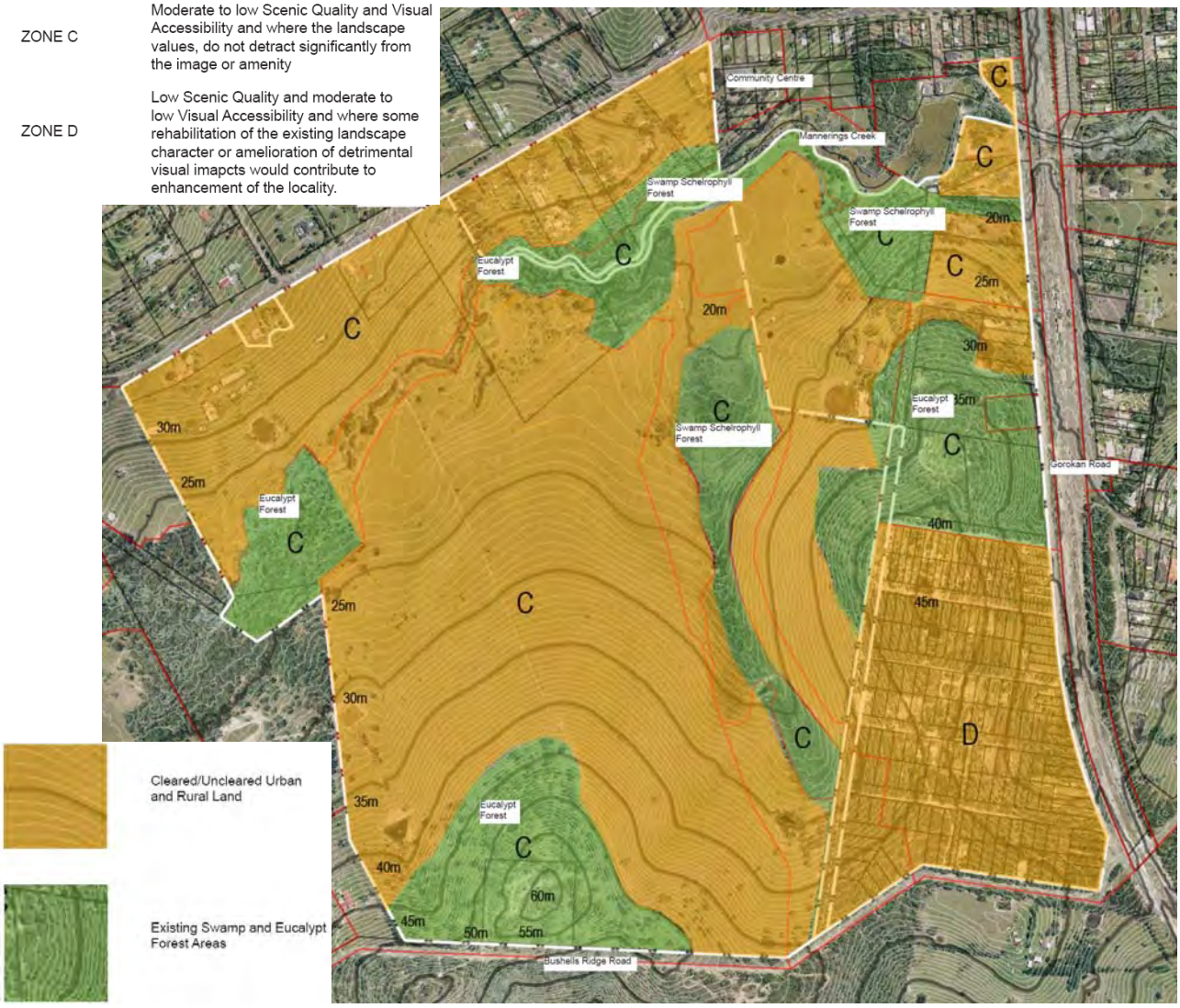


Figure 5-11: Visual Management Zones

5.5.5 Recommendations

Landscape features identified within the study site are defined as follows:

- Ridge line along Bushells Ridge road with remnant vegetation
- Riparian vegetation along drainage corridors
- Remnant vegetation along Gorokan road

The measures proposed to assist the visual objectives are as follows:

- Retain and maintain existing vegetated ridgelines
- Retain and maintain existing site vegetation as visual screen where possible
- Ensure a screen buffer of existing vegetation is maintained along the site perimeter
- Revegetation of cleared riparian corridors
- Ensure landscape treatment of visually sensitive areas along roads are sympathetic to the existing landscape character.

Figure 5-12: Visual Management Recommendations

5.6 Indigenous Heritage Assessment

Insite Heritage was commissioned to undertake an indigenous heritage assessment for the subject site. A copy of the report is provided in **Appendix 5**. The assessment included a desktop assessment and foot survey of the site.

Aboriginal Heritage Information Management System (AHIMS)
A search was undertaken of the DECCW Aboriginal Heritage Information Management System (AHIMS) for a 10km x 10km area around the study area. The AHIMS search identified 28 sites in the vicinity of the study area, however none were on the subject site. A range of sites were identified, including middens, open camp sites, grinding groves and artefact scatters.

Consultation and Survey
The survey identified two locations of artefact scatters along the margins of Mannering Creek, one possible stone formation and three historic blazed trees, two located on the southern margins of Mannering Creek and one in the south western corner of the study area.

One artefact scatter (identified as "Mannering Creek 1") was located on the north side of Mannering Creek and comprised of three loci of artefacts. Loci 1 comprised three artefacts. Approximately 15m west, Loci 2 comprising of two artefacts was located in the eroded face of the creek bank. Loci 3 was located approximately 6-7m north of Loci 2 and comprised of an isolated flake situated in an exposure at the base of a tree. Six artefacts in total were identified at the site.

The second artefact scatter ("Mannering Creek 2") comprised a silcrete flake, mudstone flake and 2 fragments of debitage, located on the north west fence line of the site.

A possible stone formation was identified on the site by Shane Frost of ADTOAC. It was located on the northern side of a large tree in the southern portion of the study area. It was situated at the top of a gentle slope facing north, to the south of Mannering Creek and with a good outlook to Mt Sugarloaf. The feature covers an area 780 x 880mm at the base of a tree, and comprises of a stack of approximately twelve stones (sandstone) at the base of the tree. A tree root had overgrown some of the stones at the base of the pile on the western side. The exact age and use of the pile whether it was constructed in historical times or earlier is difficult to determine.

The sites located within the study area have been generally located on the creek line within an area likely to be subject to periodic flooding. The minimal visibility of the study area at the time of survey makes it difficult to draw conclusions regarding the exact extent of sites and therefore the potential for development to impact upon them.

The results show that:
1. There are open camp sites in the study area.
2. The extent of those sites are not known.

3. Based on models developed elsewhere the sites are likely to reduce in density with distance from the creek.

In general whilst there are indigenous sites within the study area these need not constrain development and when considered in conjunction with other natural site constraints the main values of the sites could be preserved in-situ.

Draft Lake Macquarie Aboriginal Heritage Management Strategy (2009)
In 2002 Council and representatives of the Local Aboriginal Land Council signed a Statement of Commitment which defined how Council would recognise the contribution of Aboriginal culture and sustainably manage Aboriginal cultural resources within the LGA. The draft Lake Macquarie Aboriginal Heritage Management Strategy (2009) sets out how Council and the local Aboriginal community will implement this Statement of Commitment.

The strategy provides an overview of the Aboriginal history and archaeological record of the Lake Macquarie area, identifies the cultural heritage values of the area to the Aboriginal community and provides a strategy for protecting and sustaining these values. Identified strategies to protect Aboriginal cultural landscapes include amending the objectives of some LEP zones to specifically recognise such landscapes, and working with Aboriginal community groups and other government agencies in developing proactive risk management measures.

The draft strategy was exhibited following commencement of the heritage study, however the current report is in line with the strategy and ensures that all Aboriginal community groups that may have an interest in the site have been consulted.

As part of the strategy, Council proposes to use strategic land use and land management tools to contribute to the protection of important Aboriginal cultural landscape values. Council is committed to a planning process that recognises Aboriginal community cultural heritage at the landscape scale and strategic level and does not propose to rely on achieving multiple small (often disconnected) conservation outcomes from individual development assessment processes as its main strategy for achieving conservation of Aboriginal cultural heritage values.

The LES has considered the identified items of Aboriginal cultural heritage on the site when determining the potential zones for the site. This is discussed further in Section 10.2.

5.7 Non-indigenous Heritage

Insite also undertook an assessment of the non-indigenous heritage significance of the site. Four historic features were identified on the site.

1. An historic subdivision layout.
2. Three surveyed marked trees.

The historic subdivision dates from 1914. The subdivision has been partially developed with unsealed roads and some housing in use. The names of the streets within the subdivision are of interest and maybe Awabakal in origin. It is recommended that the road names be retained within any future development.

The survey trees have low archaeological potential and should be retained in situ if possible. Given the location of the survey markers it is anticipated that development could avoid them if lower lying areas of the site are not going to be developed / or excluded by the use of building envelopes.

One tree was located along Mannering Creek, in the north east of the site. The tree was dead and there did not appear to be any re growth around the scar of the tree. The original axe cut marks are still visible at the top of the scar, indicating that the tree may have already been dead at the time of marking.

Another tree was located just south of Mannering Creek, in the central portion of the site. The tree had been felled with the scar facing the ground.

The third tree was originally located by Antony von Chrismar, Ecologist, EcoLogical Pty Ltd. The site is an historic survey tree. The tree is located in the south western corner of the study area. A survey of this area was conducted as part of the site visit on the 27.11.09. The survey was unable to re-locate the survey tree.

In general whilst there are non-indigenous sites within the study area these need not constrain development and when considered in conjunction with other natural site constraints the main values of the sites could be preserved in-situ.

5.8 Extractive and Mineral Resources

The Mine Subsidence Board was contacted in relation to the proposal and did not identify any areas of interest for the site. The DPI had not identified any areas of interest as part of the Section 62 consultation and did not respond to subsequent correspondence requesting confirmation of such. Refer to **Appendix 4** for further detail.

A review of current proposals and existing mining operations in the area has revealed that there are no existing or proposed operations in the immediate vicinity of the site.

There are a number of underground mining operations in Lake Macquarie. Those closest to the site include Chain Valley, Mannering, Cooranbong and Mandalong. These are all located some distance away, with the closest approximately 5km to the north east.

There are current proposals at existing mines at Chain Valley Mine (Mannering Park) and West Wallsend. There is also a major Part 3A application currently being assessed

for the Wallarah 2 Coal Project, which is located approximately 7.5km south west of the subject land.

The Wallarah 2 Coal project involves a new underground coal mine comprising:

- extraction of up to 5 million tonnes of run-of-mine coal a year from an underground mine for up to 28 years;
- coal handling and stockpiling facilities;
- surface support facilities and infrastructure;
- rail and train loading infrastructure;
- transportation of product coal to domestic and export markets via rail; and
- rehabilitation of the site.

The proposal would be unlikely to be affected by existing or proposed extractive industries in the area. In addition, there have been no areas of interest identified in the vicinity of the subject land which would be affected by the future development of the land.

6 Transport & Infrastructure

6.1 Traffic & Access

A traffic study has been prepared by Cardno and is provided in **Appendix 9**. The report evaluates the impact of traffic associated with the future development of the land and recommends appropriate access arrangements.

The surrounding road network comprises the following:

- **Wyee Road**: a regional road, under the control of Lake Macquarie City Council. It functions as an important link between the northern Central Coast and the Sydney- Newcastle (F3) Freeway at Morisset. Through the study area, Wyee Road consists of a single undivided carriageway with two traffic lanes. The speed limit through the Wyee urban area is 60km/h, with a school zone adjacent to Wyee Primary School. Outside of the urban area the speed limit increases to 80km/h.
- **Hue Hue Road**: extends from near Wyong to Wyee. Formerly a Main Road, Hue Hue Road is now a local road under the control of Lake Macquarie City Council through the study area. Through the study area, Hue Hue Road consists of a single undivided carriageway with two traffic lanes. The speed limit is generally 70km/h, lowering to 60km/h on approach to the junction with Wyee Road.
- **Gorokan Road**: a local road, running parallel to the Main North Railway Line between Mannering Creek and Gosford Road. At its northern end, Gorokan Road passes under the railway line between the piers of the structure that carries the railway line across Mannering Creek. Traffic is confined to a single lane and the vertical clearance is restricted to 3.83 metres. North of Darlingup Road, Gorokan Road is generally a 7 metre wide undivided carriageway. South of Darlingup Road, Gorokan Road is a 7 metre wide undivided carriageway with an unsealed gravel surface. A footbridge links Gorokan Road to Wallarah Street; however no traffic thoroughfare is permitted.
- **Bushells Ridge Road**: a local road, running east-west between the Main North Railway Line and Hue Hue Road. Through the study area, Bushells Ridge Road is a generally 7 metre wide undivided carriageway and has sealed and unsealed road sections. It is sealed along the frontage of the site.
- **Gosford Road**: a local road, running east-west between the Main North Railway Line and Wyee at the southern edge of Wyee. It functions as the eastern extension of Bushells Ridge Road. It is an approximately 7 metre wide single undivided carriageway.

Intersection counts for the following intersections were undertaken:

- Wyee Road – Gorokan Road
- Bushells Ridge Road – Gorokan Road

- Wyee Road – Hue Hue Road
- Hue Hue Road – Bushells Ridge Road
- Wyee Road – Gosford Road

Traffic surveys undertaken on the surrounding road network as part of the study in 2009 revealed that the AM peak is 7:45am – 8:45am and PM peak occurs between 4:15pm – 5:15pm. These were used as the basis for the traffic assessment.

Traffic generation rates were based on the RTA's *Guide to Traffic Generating Developments* and an indicative lot yield of 1100 lots (this was determined following the detailed land capability analysis, as discussed in later sections of the LES). This represented an additional 9900 daily vehicle trips and 935 trips during peak hour.

6.1.1 Mid-block Capacity & Intersection Performance

The following tables represent the existing and future mid-block capacities of the surrounding road network and the performance of key intersections during both the AM and PM peak periods.

All roads currently operate at both AM and PM peaks at a Level of Service A[2] (Table 6-1), and all movements for the intersections performed with a Level of Service A, with minimal delays and no queues in either the AM or PM peak periods (Table 6-2). This indicates that the road network has considerable spare capacity during the peak periods.

Mid-block performances on the majority of surrounding roads following development of the site would continue to operate at levels of service during the AM and PM peaks (either A or B). During the PM peak, however, Wyee Road (south of Gorokan Road) southbound, would operate at level of service D.

Table 6-1: Mid-block AM Peak Hour Level of Service

Location	Direction	Existing Volume	Future Volume	Existing LoS	Future Los
Hue Hue Rd, West of Wyee Rd	East	73	274	A	A
	West	127	421	A	A
Bushells Ridge Rd, West of Gorokan Rd	East	19	123	A	A

[2] Level of Service (LoS) is a qualitative measure describing the operational conditions on a road and their perception by a driver. Levels A to D comprise tolerable levels of delay, while Levels of Service E and F are intolerable.

	West	16	80	A	A
Wyee Rd, Sth of Gorokan Rd	East	291	852	A	B
	West	245	651	A	A
Gorokan Rd, West of Wyee Rd	East	5	278	A	A
	West	4	73	A	A

Table 6-2: Mid-block PM Peak Hour Level of Service

Location	Direction	Existing Volume	Future Volume	Existing LoS	Future LoS
Hue Hue Rd, West of Wyee Rd	East	145	446	A	A
	West	104	356	A	A
Bushells Ridge Rd, West of Gorokan Rd	East	8	51	A	A
	West	8	100	A	A
Wyee Rd, Sth of Gorokan Rd	East	279	717	A	A
	West	425	1188	A	D
Gorokan Rd, West of Wyee Rd	East	16	101	A	A
	West	11	293	A	A

Results for the future scenarios revealed that the Wyee Road/Gorokan Road intersection would operate at an unsatisfactory level of service F in the PM period, with heavy delays experienced by vehicles entering on the Gorokan Road approach (Table 6-3). These delays are due to heavy traffic volumes travelling along Wyee Road. The intersection would operate with smaller delays during the AM peak at a level of service C.

The intersection of Wyee Road/Gosford Road also operates at a level of service F in both the AM and PM peak periods, with heavy delays experienced by vehicles entering on the Gosford Road approach (Table 6-4). These delays are due to heavy volumes of traffic travelling along Wyee Road.

Table 6-3: Intersection Performance AM Peak

Intersection	Existing Intersection Analysis			Future Intersection Performance (2019)*		
	Degree of Saturation	Delay (s)	Level of Service	Degree of Saturation	Delay (s)	Level of Service
Wyee Rd/Gorokan	0.007	10.6	A	0.765	36.4	C

Rd						
Bushells Ridge Rd/Gorokan Rd	0.008	10.1	A	0.203	10.3	A
Wyee Rd/Hue Hue Rd	0.021	9.6	A	0.372	9.3	A
Hue Hue Rd/Bushells Ridge Rd	0.029	11.6	A	0.102	11.6	A
Wyee Rd/Gosford Rd	0.037	13.4	A	>1.000	>120	F
Hue Hue Rd/Access Road	-	-	-	0.437	15.5	B
Bushells Ridge Rd/Access Road	-	-	-	0.090	9.6	A

**2019 Base plus Development Traffic*

Table 6-4: Intersection Performance PM Peak

Intersection	Existing Intersection Analysis			Future Intersection Performance (2019)*		
	Degree of Saturation	Delay (s)	Level of Service	Degree of Saturation	Delay (s)	Level of Service
Wyee Rd/Gorokan Rd	0.022	10.9	A	0.932	>120	F
Bushells Ridge Rd/Gorokan Rd	0.004	10.1	A	0.175	10.1	A
Wyee Rd/Hue Hue Rd	0.042	9.3	A	0.547	9.3	A
Hue Hue Rd/Bushells Ridge Rd	0.089	11.5	A	0.137	13.0	A
Wyee Rd/Gosford Rd	0.039	18.1	B	>1.000	>120	F
Hue Hue Rd/Access Road	-	-	-	0.298	17.2	B
Bushells Ridge Rd/Access Road	-	-	-	0.068	9.5	A

**2019 Base plus Development Traffic*

These two intersections, which are forecast to operate at an unsatisfactory level of service F, would require additional capacity in the future to cater for demand. Alternatively, the introduction of banned movements to allow the safe movement of traffic. Potential improvements are discussed below.

6.1.2 Intersection Improvements

Wyee Road/Gorokan Road
This junction is currently configured as an unsignalised T-intersection, and a potential upgraded form could involve a signalised T-intersection, with Wyee Road traffic given priority. Left-turn slip lanes have been recommended along Wyee Road (South) and Gorokan Road as well as a right-turn pocket along Wyee Road (North). All through movements and exit lanes are single lanes in each direction.

This form may be difficult or costly to achieve due to the constraints in the area including the rail bridge overpass and the culvert/bridge immediately north of Gorokan Road. Further detail investigation into the future form and function of this intersection should be considered as part of the master planning for the site.

Wyee Road/Gosford Road
This junction is currently configured as a unsignalised T-intersection, and a potential upgraded form could also involve a signalised T-intersection, with Wyee Road traffic given priority. Left-turn slip lanes have been recommended along Wyee Road (South) and Gosford Road as well as a right-turn pocket along Wyee Road (North). All through movements and exit lanes are single lanes in each direction.

6.1.3 Preferred Access Locations

The location of access points from the site onto the existing road network has been assessed as follows:

Hue Hue Road/Access Road – the road alignment of Hue Hue Road permits safe access to the site generally along its full length with the exception of a horizontal curve some 300 metres from the freeway. It is recommended that the access location be provided in the form of a T-junction located some 500 metres east of the Freeway.

Bushells Ridge Road/Gorokan Road – the existing intersection location has sight distance constraints for vehicles exiting Gorokan Road sighting eastbound vehicles due to the horizontal curves immediately west of the intersection. Bushells Ridge Road needs to be realigned to remove these two horizontal curves to improve safety at the intersection.

Bushells Ridge Rd/Access Road – Bushells Ridge Road is characterised by a number of vertical curves along the frontage of the development which restricts some sections of the road from providing a safe access point. Similarly near the western and eastern boundary edges of the site are horizontal curves which result in unsuitable locations for access points. Given these constraints the most suitable location is approximately 100 metres east of the western boundary of the site.

Wyee Road Access via Gorokan Road/Dillabirra Road – Two alternative options were considered for access to Wyee Road, namely a northern connection via to

Gorokan Road and a southern connection utilizing the existing road reserve of Dillabirra Street, connection to Gorokan Road at the rail station.

The northern connection via Gorokan Road potentially provides a more appropriate connection from a transport perspective, allowing development of a legible collector road network in the development area, however, it has the potential to have a more significant environmental impact than the southern connection via Dillabirra Street/Gorokan Road at the rail station.

Providing a connection via Dillabirra Road/Gorokan Road has the potential to impact less environmentally, and provide an opportunity for activation of Gorokan Road and the rail station precinct. This alternative also allows development of a pedestrian/cycle link directly to the rail station. Currently, access driveways to the rail station carpark are located in locations likely to conflict with intersection turning movements and these should be relocated should this alternative be pursued.

Both alternatives provide a satisfactory transportation outcome, and no significant traffic impacts are expected with either scheme.

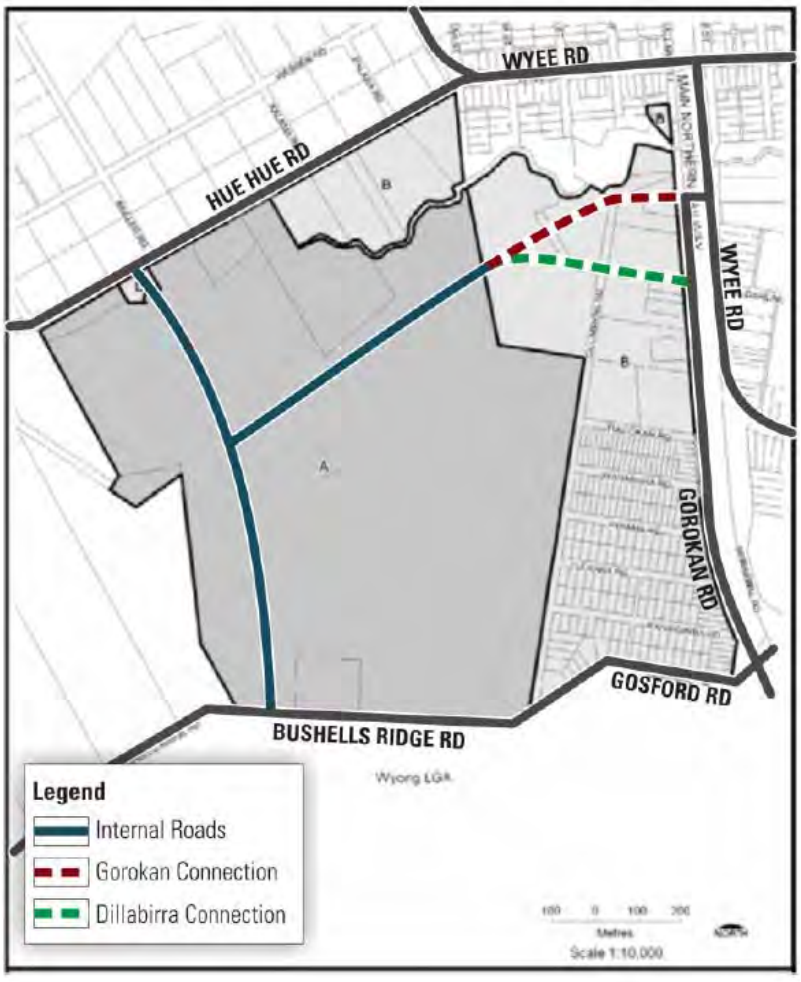


Figure 6-1: Potential Internal Road Network & Recommended Access Points

6.2 Services

An infrastructure services report was prepared by Cardno to assist in preparing the LES and is provided in **Appendix 10**. The report examines the availability and capacity of existing services in the area to service the site. The report also looks at staging and likely infrastructure costs.

6.2.1 Water

The existing Wyee township is serviced by the Hunter Water's Morriset–Wyee Water Supply System. The Gosford-Wyong trunk water supply pipeline is located adjacent to the F3 freeway some 500m to the west of the study area. Hunter Water has advised that there is insufficient capacity with the existing supply system to service any loads from proposed development at Wyee.

Significant upgrades to Hunter Water's water supply system will be required to service population growth in the Wyee area. A new 3.0ML reservoir will be required to supply the development at Wyee for population growth in the area to the 2031 horizon.

Connection to the Gosford-Wyong trunk water main which is located adjacent to the F3 Freeway at either Hue Hue Road at Bushells Ridge Road has been identified by Hunter Water as a suitable off-take point to supply the new reservoir. The new reservoir would ideally be sited at the top of the ridge within the study area adjacent to Bushells Ridge Road with a lead in main from the Gosford-Wyong trunk situated along Bushells Ridge Road. It is expected that the easement required to site the reservoir and associated access roads would be in the order of 0.3 to 0.5 ha.

Hunter Water has advised that as the new reservoir required for the study area will improve water supply to the surrounding development in Wyee, they will contribute to the costs for implementation of the required infrastructure. The funding has been allocated in the Forward Capital Works program for FY2012/13. The quantum of funding will be determined following finalisation of the water servicing strategy. Infrastructure required in advance of Hunter Waters Forward Capital Works Program may attract developer charges which would otherwise not apply following the NSW Government's December 2008 levy reforms.

The estimated costs associated with supplying water to the study area are approximately $9.15M.

6.2.2 Sewer

Wyee and the site is presently unsewered. The nearest sewer system to the site is located at Wyee Point 5km north east of the study area. The absence of sewer infrastructure in the area has historically been the main barrier to development and population expansion.

The provision of significant new sewer infrastructure is required to service the anticipated 2000 additional dwellings in Wyee by 2031. Several options to service the development at Wyee with sewer have been investigated previously by Hunter Water, Patterson Britton and Partners and MacroPlan Australia.

These options include:

1. Transfer wastewater flows to Dora Creek WWTT (Waste Water Treatment Works).
2. Transfer wastewater flows to Charmhaven WWTP in Wyong Local Government Area.
3. Construct new WWTP at Wyee to service development in the local area.
4. Transfer dry weather flows to Wyee Point and store peak wet weather flows on-site at Wyee for off-peak disposal.

Hunter Water have advised that Option 1 is their preferred option and that they do not support options 2, 3 or 4.

Transfer of waste flows to Charmhaven (Option 2) is problematic due to the complex agreements required to be entered into between Wyong Council and Hunter Water regarding income, developer charges and trade waste charges. Hunter Water would be charged trade waste levies by Wyong Council under this sewer servicing strategy. Following the NSW Governments December 2008 levy reforms, Hunter Water are not able to levy developer charges. Wyong Council, who are exempt form these reforms would be in a position to also charge for developer contributions.

The construction of an on-site waste water treatment plant (option 3) is not favoured by Hunter Water due to its location within the catchment of Lake Macquarie and the possible environmental impacts on the lake system. These issues could be potentially mitigated by reuse of the effluent for water supply for grey water use within the new development subject to further investigation. There is a significant planning and approval phase required for the construction of a new WWTW which typically take between 2 to 3 years to implement.

Option 4 is not seen as a long term solution for development at Wyee due to the limited capacity of the Wyee Point system.

Hunter Water are proceeding with a major upgrade of the Dora Creek WWTW accommodate population growth in the Dora Creek, Cooranbong and Morriset catchments. The $30 million upgrade will increase the capacity of the plant from its existing 24,000 Equivalent Tenement (ET) capacity to 48,000 ET's by extending the existing effluent main from Dora Creek to Eraring Power station to Toronto WWTW. The upgrade will allow effluent from future development in the Dora Creek WWTW catchment to be transferred to the Belmont Ocean Outfall where the load from future development exceeds the effluent re-use demand of Eraring power station.

The upgrade is based on Hunter Water's population projections in the catchment to 2030 which includes an allowance for development at Wyee consistent with Lower Hunter Regional Strategy objectives. The upgrade is programmed to be completed by 2011. In order to deliver effluent from the study area to Dora Creek WWTW, a local pump station and approximately 12.5km of rising main will be required.

The order of costs for the infrastructure required for the transfer of effluent from the study area to the Dora Creek WWTW are approximately $13.3M.

It should be noted that Clause 106 of *State Environmental Planning Policy (Infrastructure) 2007* provides that development associated with sewage treatment plants and water recycling facilities may be carried out by or on behalf of a public authority or any person licensed under the *Water Industry Competition Act 2006* without development consent being granted under Part 4 of the EP&A Act on land in a "prescribed zone" and that sewerage reticulation systems may be carried out by or on behalf of a public authority or any person licensed under the *Water Industry Competition Act 2006* on any land without development consent. The SEPP defines a sewage reticulation system as a facility for the collection and transfer of sewage to a sewage treatment plant or water recycling facility for treatment, or transfer of the treated water for use or disposal, including associated:

- pipelines and tunnels, and
- pumping stations, and
- dosing facilities, and
- odour control works, and
- sewage overflow structures, and
- vent stacks.

6.2.3 Electricity

Electrical supply to the existing village is from the Morisset Zone substation. Energy Australia have made provisions in their long term planning for future development at Wyee and have allocated spare capacity for this purpose at the Morisset zone substation and programmed the construction of a second High Voltage (HV) feeder to Wyee in anticipation of the increased demand.

Energy Australia have calculated the electrical demand for an additional 1,500 residential lots at Wyee to be 6.0MVA. This load can be serviced by the Morriset Zone substation and two HV feeders to the site.

In the event that the final development mix results in energy demand greater than this amount, Energy Australia have indicated that a third HV feeder form the Morriset Zone substation would be required or possibly a new 10MVA capacity zone substation should development include substantial commercial and/or industrial land uses. Zone substations typically take two years to establish and as such Energy Australia will need advanced notice of the final estimated loads of Wyee.

The electrical reticulation with future development on the site will be delivered to dwellings via underground cables within the road reserve either within their own trench or in a shared trench with telecommunications and gas services. Pad mount of "kiosk" type substations will be required throughout the development to transform the electricity for domestic application. The final number of kiosk substations will depend on the final road layout and density of development, however it is anticipated that in the region of 20 substations will be required to meet demand from the ultimate population.

Energy Australia will supply and fund the standard dedicated customer substation equipment including the transformer, HV switch gear, protection CT's and relays. The developer is required to fund a lump sum of $20,000 per substation and all site preparation works. The developer will be required to fund all trenching works for the reticulation network. Electrical reticulation cables will be supplied and laid at Energy Australia's cost. Energy Australia will also fund connection and HV feeder works based on final load figures and a cost benefit analysis.

6.2.4 Telecommunications

Wyee is presently serviced by Telstra's copper network from the exchange located immediately north of the site at 136 Wyee Road. The exchange is ADSL2+ broadband enabled. There is presently no fibre optic cable network connected to Wyee residential or commercial properties.

Telstra have advised that the existing services will need to be upgraded to supply future development at Wyee. The existing exchange will need to be upgraded and new fibre optic cables will need to be installed from the exchange to and throughout the development.

Funding for these upgrades are formally subject to a commercial analysis by Telstra however, in all but exceptional cases standard telecommunications upgrades are typically subsidised by Telstra. The introduction of the National Broadband (NBN) Bill in 2010 by the Federal Government means that the existing copper network will be abandoned for new greenfields development and fibre optic cables installed direct to dwellings. The developer will be required to contribute to the cost of the fibre network on a per dwelling basis. The value of the contribution is not yet finalised however it is anticipated that it will be in the order of $2,000 to $3,000 per dwelling.

The provision of mobile telephone infrastructure is usually undertaken by mobile network company on a reactionary basis i.e. when existing networks are overloaded they proceed with the implantation of new mobile repeater towers.

6.2.5 Gas

The study area is currently not connected to Jemena's (formerly Alinta) natural gas system. Gas is not considered an essential service. The nearest high pressure gas main is located near the intersection of Wyee Road and Bethshan road north of the study area.

Gas supply to the study area will be from the existing high pressure main 1km north of the site. A new lead in main will be required along Wyee Road from Bethshan Road to Hue Hue road adjacent to the site.

Future demand from the Wyee area is expected to be in the region of 50,000 Gj. Jemena have confirmed that gas can be extended to the study area to meet the forecast population growth to the 2031 horizon.

Jemena undertake their own cost benefit analysis to determine the contribution required from developers to upgrade their network. This study will be undertaken when the final development mix and densities are finalised. Recent experience with developments of a similar scale to the subject project indicate that Jemena's business case for the number of new customers expected from a development such as Wyee would result in only partial or nil contributions from developers for upgrade of the gas network. Developers would be required to fund in full the trenching for the gas reticulation through the new development. The gas mains would be supplied and laid by Jemena contractors usually at their cost.

6.2.6 Staging

In order to manage upfront capital development costs, it is recommended that consideration be given to developing the northern portion of the site adjacent to Wyee Road and Hue Hue Road first due to the proximity of this area to the proposed lead-in utility infrastructure works required to service the wider development. For example proposed HV electricity feeders, Telstra fibre optic, high pressure natural gas mains are all connected the site in the vicinity of Wyee Road. The proposed sewer pump station is also located at the northern portion of the site adjacent to Mannering Creek and the Railcorp train line easement. It is noted that the proposed location for potable water supply is located on the southern side of the site and development of the northern portion of the site first would involve water main extensions through future stages from the reservoir.

Subsequent stages should focus on development of land progressively south in order to take advantage of trunk infrastructure installed to the stage immediately north to minimise high upfront capital costs associated with the installation of large distances of trunk infrastructure to stages remote from the main lead-in entry points to the site. Based on the findings of the geotechnical investigation carried out for the subject LES and the flat nature of Gorkan Road at the eastern boundary of the site it is expected that significant rock excavation will be required to drain waste water from the south eastern portion of the site (land within the paper subdivision). Consideration should be given to developing this portion of the site last due to this issue and its relative remoteness from trunk lead in infrastructure.

As the staging strategy for the Wyee expansions is heavily dependant on provision of sewer services, the strategy will vary should the sewer servicing strategy change from that preferred by Hunter Water (i.e. Dora Creek).

7 Social & Economic Environment

Social and Economic Impact Assessments (**Appendices 11** and **12**) were undertaken as part of the LES. These assessments examine the impacts of the future development of the site on Wyee and locality and identify services and requirements of the future population. Each study was based on assumption that the future development could provide up to 1100 allotments.

7.1 Wyee Community Profile

The following is a summary of the Wyee Community Profile provided within the Social Impact Assessment (**Appendix 11**). It provides important background information which has been considered in developing the final land use strategy for the site. Information for the community profile has been derived from the Census of Population and Housing. The smallest areas publicly available from the census are Census Collection Districts (CD). The smallest area available for this report is therefore CD 1120508 which includes Precinct 1 as well as Precinct 4 (incorporating the site). This CD is referred to as the Wyee Study Area or the "study area" in this section of the LES.

A key feature of the study area is its comparatively young population, particularly the proportion of couples with children.

This is represented in the age breakdown but is also reflected in a number of other elements where the Study Area differs from the broader area. For example, the high proportion of the population purchasing their home rather than owning it out-right is an indication of a younger population. The affordability of housing in this area and its accessibility to employment by road and rail are also attractive to a younger population.

The high level of labour force participation and levels of part-time employment is further evidence of a younger population. Even the high car ownership and high level of multiple car ownership point to a population requiring greater mobility.

These characteristics contrast with the broader local government context. Lake Macquarie has an ageing population some of whom no longer participate in the workforce and often own their home. Planning for future development in the Study Area and Wyee will need to be conscious of these important differences.

7.2 Lake Macquarie City Council Social Plan 2009-2014

This plan identifies key issues which affect the liveability of Lake Macquarie including demographics, housing, health, education, employment, childcare, transport, community safety, leisure, recreation and culture. It identifies key actions which the Council can either be responsible for or will have an advocacy or facilitation role in achieving them.

Child Care

LMCC's Social Plan (2009) identifies inefficiencies in the supply of childcare that is inadequate in some areas and oversupplied in other areas and also a lack of before and after school care. The number of children in Lake Macquarie in long day care centres and pre schools increased from 2006 to 2007 (LMCC, 2009). There are the fewest vacancies in the birth to 2 year age group followed by the 2-3 year age group and pre-schools have the fewest vacancies for the 2-3 year age group than for the 4-6 year age group. LMCC's Social Plan sets out an action to identify areas of need and support the development of new child care services in these areas. The Action Plan includes a strategy to identify areas of need and support the development of new child care services in these areas and to lobby and support applications for before and after school care services. RPS contacted LMCC on 5th October 2010 regarding progress in identifying areas of need and was informed that this is currently underway, a survey has been undertaken and the results are being collated and are not yet publicly available.

Health

LMCC's Social Plan (2009) identifies a lack of GPs and services in the area. LMCC (2009) reports that in the Eastlakes there is one GP per 1346 population and in the Westlakes there is one GP per 1762 population. These are both above the ideal ratio of one GP per 1200 population and the lack of GPs in the area is identified as an issue in the Social Plan (LMCC, 2009). The Action Plan includes liaising with GP Access to encourage additional GPs to the area and to maintain existing levels of service.

Housing

LMCC's Social Plan (2009) identifies a lack of accessible, affordable and appropriate housing and the strategy for LMCC includes addressing planning provisions for affordable housing in the DCP and conducting a review of land availability for a diverse range of housing types eg aged and affordable housing.

Recreation

LMCC's Social Plan (2009) identifies a lack of activities for young people as a priority issue and LMCC's actions include assisting services to attract grants to provide additional services. Also, a priority issue is the need to ensure that residents have access to walking and cycling tracks and fitness centres and the strategy is to provide 2.5kms of new footpath paving and 6kms of new on road and off road cycleways annually. The need to make better use of Council facilities and parks is identified and the strategy is to finalise the Sports Facilities Strategy (since issued in 2010) and undertake staged redevelopment of the recreation facilities listed in the Strategy. The need to improve Council pool facilities is to be addressed implementing recommendations of the Pool Service Delivery Model for individual swimming centres. Furthermore, in relation to health, there is a need to address increasing levels of obesity and the LMCC strategy involves continuing to provide infrastructure for healthy activities such as shared pathways and sporting and recreational facilities.

Transport

LMCC's Social Plan (2009) identifies a requirement for more and improved public transport in Lake Macquarie and also a need for better cycleway connections between schools, sporting facilities, transport and residential and commercial areas. The Council have an action to advocate for improved and integrated transport systems with Lower Hunter Councils and report that additional cycleways and footpaths are being constructed (LMCC, 2009) – there is a strategy to provide 2.5km new footpath paving and 6km of new cycleways annually.

7.3 Social & Community Infrastructure

A review of the current community infrastructure in the Wyee and the surrounding area was undertaken as part of the SIA. It provides an update to the Wyee Community Planning Study Background Paper undertaken by Elton Consulting in October 2007 and was based on telephone interviews with service providers undertaken in June 2009. The following provides a summary of the key findings:

Child Care

- A child care facility is located at Collungara Street Wyee. The facility is licensed for 39 children per day. There is currently no waiting list. The operator says that there is a limited ability to expand the facility at the current site.

- Lake Macquarie Family Day Care provides care for children aged between birth and 12 years old. The care is home-based and provide registered carers with supervision by early childhood trained staff. Lake Macquarie Family Day Care is sponsored by Lake Macquarie Council.

- A playgroup operates from the Wyee Community Hall.

Education

- Wyee Public School (primary) is located at Wyee Road. It currently has 214 pupils and offers an after-school program two afternoons a week.

- As part of the Australian Government's Building the Education Revolution – Primary Schools for the 21st Century a New Hall and Covered Outdoor Learning Area ($1,030,000.00) and new Library ($970,000.00) will be constructed at the school.

Services for Young People

- Lake Macquarie Council's Draft Youth Community Plan 2007-2011 recognises that the existing youth services are concentrated in Newcastle Council area with limited youth services in Lake Macquarie Council.

- The nearest service dedicated to young people is at Morisset, the Southlake Youth Centre, at the Morisset Multipurpose Centre.

Health Services

- Wyee Medical Clinic is located in the Wyee Shopping Village, Wyee Road. The clinic is open Monday-Friday 9.00 am – 5.00 pm and has two general practitioners. Minor surgical procedures can be undertaken at the Clinic.

- The Morisset Community Health Centre is not at capacity and has the ability to meet additional demand, but does not service Wyee.

Community Centres

- The Wyee Community Hall is located on Wyee Road. It is used by a range of community groups which use the hall on a weekly basis including the "Coastal Boot Scooter Group", the Wyee Playgroup and the Grace Church Playgroup. The hall is used monthly by a local Orchid Society and for community markets and is regularly booked for local social activities.

- The Council suggested in our conversation with them that the hall is very old and is under-utilised and that there are plans by Council to extend the hall subject to grant funding.

Libraries and Cultural Centres

- Lake Macquarie Council provides a mobile library service to Wyee, which based on conversations with Council is not well patronised. The closest library is at Morisset.

Recreational & Open Space facilities

- There are a range of recreational facilities in the Study Area, which appear to be under-utilised. These include the Wyee Oval and Wyee Community Tennis Courts. The Wyee Skate Park is used regularly by local young people. There are also other facilities in the Morisset Planning District. These are further detailed in the SIA.
- The level of utilisation is generally low, apart from a number of sporting grounds and the skate park.

7.4 Housing and Accommodation

The vast majority of dwellings in the study area are separate houses (97.1%) and at the time of the 2006 census, there were no residential flat buildings in the study area.

7.4.1 Paper subdivision

The paper subdivision covers an area of approximately 22 hectares and is located in the south-eastern section of the subject site. The area is bounded on the north by Tullokan

Road, on the south by Bushells Ridge Road, on the east by Gorokan Road, and on the west by an unformed road Dillaburra Road.

The paper subdivision consists of approximately 199 lots with each lot being approximately 860m^2 in size and was formed in the early part of the twentieth century. There is a series of unformed roads through the area (Warapara Road, Pirama Road, Tulkaba Road and Karakunba Road).

The main concentration of buildings is on the north of the site in the area bounded by Tullokan Road and Warapara Road, Gorokan Road and Dillaburra Road. These works comprise a number of dwellings. There is development such as the clearing of vegetation throughout the area.

Social impacts associated with the paper subdivision are discussed in Section 10.3.1Paper Subdivision.

7.5 Future Community

The population of the study area was 876 in 2006. There was a small natural growth in the area between 2001 and 2006. Based on a number of assumptions (as detailed in the SIA), at the end of the development period (2031) the total population of the Study Area would be 3,690 which is an increase of 2,814 people.

The projected population is likely to be comparatively young. Over the period of the development, the number of projected deaths is therefore low and the projected births are high.

7.5.1 Employment opportunities

The Wyee LES Economic Analysis prepared by Hill PDA found that there would be limited employment opportunities provided in Wyee itself as a result of the proposal.

Given the high resident worker containment rates in Lake Macquarie and Wyong Council areas the key issue will be the appropriate mix of employment types in the region as a whole rather than in Wyee.

Current Wyee residents may find employment related to new construction in the area and there may be some opportunities in the potential retail development in Wyee. The current population, given their educational background, are probably unlikely to be eligible for the new jobs being generated in the Lower Hunter in tertiary sectors but these jobs may be suitable for the new population.

This is discussed further in Section 7.7.

7.5.2 Future development in the vicinity

The development of the Warnervale Town Centre in Wyong Shire and the expansion of Morisset are important in any consideration of the availability of community facilities and services for the future Wyee population. Further detail in relation to these developments is provided in Section 7.7.

The Draft Wyee Strategic Plan Background Paper notes that, because of its smaller size and the close proximity of the two larger centres, Wyee will tend to host only local level retail, services and facilities. These are likely to extend to child care, open space and recreation, new school, and expanded community centre. All other needs would be provided for in centres such as Morisset, Warnervale or Lake Haven.

7.6 Social Impacts

The social impacts associated with the proposal are discussed below and include:

- Demographic change – for example, changes to the population mix as a result of the proposal
- Community facilities and social infrastructure – changes to demand that may result from the proposal
- Accessibility – impacts of changes to public transport accessibility and car dependence
- Integration with the local area – the connection between the new development and the existing community
- Paper subdivision – impacts on the existing paper subdivision that is part of the Study Area

7.6.1 Demographic change

A key feature of the Study Area is its comparatively young population, particularly the proportion of couples with children. These characteristics contrast with the broader local government context. Lake Macquarie has an ageing population some of whom no longer participate in the workforce and often own their home.

The area is likely to continue to be largely attractive to young families preferring low density affordable housing, but may also cater to other market segments. These could include:

- Mature families with teenage children seeking low density housing in the median to premium range;
- Empty nesters looking for smaller low to medium density mid-priced housing close to the station and amenities; and
- Seniors, either singles or couples, seeking medium to higher density housing ranging from affordable to premium-priced.

The Draft Wyee Structure Plan acknowledges that Wyee will continue to serve a market niche for larger suburban lots, but that there will also be opportunities for medium density in locations close to the station, village centre and neighbourhood parks.

The new population will therefore reflect the existing population of the Study Area but will add to the diversity of the local government area.

Lake Macquarie Council has developed policies to address this City-wide issue in its Social Plan and allocated funds for its implementation. This appears to be sufficient to address the potential difference between the Study Area population and the rest of Lake Macquarie.

7.6.2 Community facilities and social infrastructure

Benchmarks

The following facility and service planning standards are adopted for the purpose of this study. These standards have been negotiated with Lake Macquarie Council and are consistent with most recent benchmarks for social infrastructure.

Table 7-1: Facilities and Service Standards

Facility/service	Standard	Site area requirement
Children's services	1 place per 5 aged 0-4	46.4m2/place
Before/after school care	1 place per 25 aged 5-12	12m2/place
Youth centre/annex	1 facility for 13,000 pop	231m2/1000 pop
Multipurpose centre	1 per 3000-4000 pop	209.7m2/1000 pop, min 500m2 GFA
Library	n/a	160m2/1000 pop
Open space/recreation		45.92m2/person or 114.8m2 per lot
Informal park	1 per 1000 pop	0.5ha
Park with facilities	1 per 1000 pop	0.5ha
Play equipment	1 quantity per 1000 pop	0.5ha
Sports field	1 per 1200 pop	n/a
Cricket wickets	1 per 3000 pop	n/a
Cricket practice nets	1 per 3500 pop	n/a
Tennis courts	1 per 2000 pop	n/a
Netball courts	1 per 1500 pop	n/a

There is no set requirement for providing cycle ways and pedestrian routes, other than they are required to link residents to key destinations.

The Department of Education's planning standard for the provision of new schools indicates that a primary school is required for every 1,500-2,000 lots. The provision of health services is generally assessed on an "as needs" basis.

7.6.3 Demand for services and facilities

The demand for additional facilities and services generated by the new population is as follows:

Table 7-2: Demand for Facilities

Facility/service	No. required
Children's services	30 places (23 in long day care, 7 in family day care)
Before/after school care	3 places
Youth centre/annex	Insufficient demand for stand alone facility
Multipurpose centre	One centre, can accommodate children and youth services
Library	450m^2 floorspace
Open space/recreation	12.92ha (based on 45.92m^2 of open space/person) or 11.48ha (based on 114.8m^2/lot)
Informal park	3
Park with facilities	3
Play equipment	3 quantities (minimum of 6 play opportunities e.g. swing, slide)
Sports field	3
Cricket wickets	1
Cricket practice nets	1
Tennis courts	1
Netball courts	2

Advice from the NSW Department of Education (DET) is that a new primary school will not be required.

Hunter New England NSW Health has advised that development of up to 1,000 dwellings in Wyee is not likely to increase significantly the demand for health services and any additional demand will be met by existing services.

7.6.4 Needs assessment

A summary of the need for new facilities, in the context of existing provision and future demand is identified in the table below.

Table 7-3: Summary of Needs

Facility/service	No. required
Children's services	There is limited ability to expand and it will be necessary to provide the 30 places (23 in long day care, 7 in family day care) and 3 before/after school care Long day care can be located in the proposed community centre Child care can be provided by either Council or private provider
Youth centre/annex	Insufficient demand for stand alone facility but can be provided by access to Morisset Youth Centre or outreach services from expanded Wyee Community Centre
Multipurpose centre	Existing community hall is underused and requires updating. It is recommended that this hall be modernised and expanded to function as a multi-use community centre capable of providing a variety of children's and youth services, office accommodation for outreach workers and parking The expansion could be funded through developer contributions or planning agreement School hall could also be used for community purposes and should be taken into account in any plans for multipurpose centre
Library	Expand Morrisset Library by 450m^2 floorspace to cater for additional demand The expansion could be funded through developer contributions or planning agreement
Open space/recreation	Existing facilities are generally underused and Wyee Oval is poorly located with respect to the Study Area 12.92ha (based on 45.92m^2 of open space/person) or 11.48ha (based on 114.8m^2/lot) but could be reduced to account for underutilised tennis courts. The riparian corridor should be investigated for informal parks and parks with facilities. Local parks should be located within 500 metres of dwellings. They should be connected to walking and cycling routes to encourage an active lifestyle. Provision of open space and recreational facilities should be shared between Council and developer. Cycleways and pedestrian routes to be provided in accordance with the draft Wyee Structure Plan.
Educational facilities	Advice from the NSW Department of Education (DET) is that a new primary school will not be required.
Medical services	Hunter New England NSW Health has advised that development of up to 1,000 dwellings in Wyee is not likely to increase significantly the demand for health services and any additional demand will be met by existing services.

7.6.5 Priority facilities

Given that the projected population is predominantly younger families, the child care centre places and new library should be treated as "priority facilities" and provision brought forward in the development process.

The construction of the new facilities at Wyee Public School is a potentially significant investment in the social infrastructure of Wyee. A condition of the Australian Government funding is that the school must agree to provide reasonable access to libraries and multipurpose halls by any community or not-for-profit group in the local community at no, or low, cost. Schools may charge a low fee for the use of the facility where the charge is to cover recurrent costs incurred by the school in providing the community access (for example electricity, cleaning and security). Subject to an agreement with Department of Education and Training, the provision of an additional community hall could relieve some of the pressure on the existing community hall in Wyee Road and use of the school library may also be a stopgap until a new public library is provided.

Timing on the provision of facilities will need to be determined in accordance with a staging plan adopted in the master planning process, and in line with the benchmark triggers identified above.

7.6.6 Accessibility

The Study Area is well connected in terms of the road network to the surrounding area and to Sydney and Newcastle. A regional road (Wyee Road) links the Study Area to the northern Central Coast and the Sydney-Newcastle (F3) Freeway at Morisset and a local road (Hue Hue Road) links the area to Wyong. The Wyee LES Traffic Report notes that there will be some deterioration in the quality of local roads in the Study Area due to the development with the intersection of Wyee Road/Gorokan Road and intersection of Wyee Road/Gosford Road experiencing heavy delays.

In terms of public transport the Study Area is less well connected. It has relatively poor local public transport access with limited bus services during weekdays and no service on weekends. Access to commuter transport is relatively good with connections to Sydney, Gosford and Newcastle from the rail station. The Wyee LES Traffic Report also notes that the area has limited pedestrian and cyclist facilities. The Wyee Study Area is therefore highly car dependant. As noted in the Community Profile, households in Wyee have high levels of car ownership and high levels of multiple car ownership.

Further actions to reduce car dependence should be examined. High levels of car dependence have a number of potential impacts, including impacts on health and levels of obesity in the community. A significant proportion of household income is also used to run and maintain motor vehicles.

The high car dependence and limited public transport options means the Study Area population is also significantly impacted by fluctuations in oil prices. The capacity of the

Wyee population to respond to changes in oil prices is less elastic than some communities because with little public transport available it is difficult for them to shift from private motor vehicles to other modes of transport. Rising oil prices can therefore reduce access to activities and services outside the immediate local community.

Higher inflation due to petrol price increases can lead to higher interest rates, which are designed to counter increases in inflation, and mortgage stress for those purchasing their homes. The Study Area will have a high proportion of households purchasing their home and there may be some incidence of severe mortgage stress.

The level of car dependence could be reduced by this proposal by providing additional cycleways, pedestrian pathways and higher density near the train station.

7.6.7 Integration with the local area

At the moment the Study Area is physically separated from the Wyee Township. There will be better physical integration of the Study Area and the township as a result of proposed changes to the physical infrastructure.

There should also be actions aimed at socially connecting the new communities with the existing Wyee Township community, with the aim of fostering a new "sense of community" that encompasses the changed physical environment.

The plan to use the Wyee Township as the focus of retail development will increase opportunities for casual interaction and the location of future community facilities should be planned to maximise these opportunities for connectedness.

7.7 Economic Impact Assessment

The economic assessment prepared by Hill PDA for the site (**Appendix 12**) examines the suitability of the area to provide for future urban land uses based on likely future demand for employment and residential land in Wyee.

There are a number of key characteristics of the resident population in Lake Macquarie, Wyong and Wyee which influence demand for employment and residential land, including:

- Like Wyong LGA, Wyee has a significantly younger population than the remainder of the Lake Macquarie LGA.
- The median weekly household income in Lake Macquarie is significantly higher than Wyong.
- Lake Macquarie and Wyong had higher proportions of residents working as technician and trade workers than other occupations.
- Residents in Wyee are mostly employed in blue collar positions like machinery operators, drivers, labourers, and related workers.
- Both Lake Macquarie and Wyong have experienced growth in residents working in service industries (administration, education, health care,

scientific, recreation, support services) and construction as a result of significant residential and retail development in the Region.

- The Lower Hunter and Central Coast have high resident worker containment rates due the vast amount of employment land available with existing industry intensifying, new industries relocating to the Region, and retail growth due to increased residential populations.

Based on the examination of supply and forecast demand for residential lands across the Lower Hunter and Central Coast, the key considerations for future residential development in Wyee are:

- It is recognised the recent downturn in the economy has impacted on demand for housing in the Lower Hunter and Central Coast Region's, however this is considered a short term trend.
- The Lower Hunter will always attract residential development due to its high amenity, coastal location, and proximity to services and jobs.
- Given the lack of any base industries in Wyee, it is likely that residential will remain the highest and best use of land in the local area.
- The Lower Hunter Regional Strategy indicates 2,000 residential dwellings are forecast for the Wyee release area to 2031.
- Lake Macquarie Council's analysis indicates Wyee could support around 2,200-2,700 additional dwellings to 2031, resulting in a total population of around 7,000-8,100 people in 2031.
- Larger lots with single detached dwellings and affordable product will be viable in Wyee.
- The potential for medium density development (e.g. duplexes) exists adjacent or near the train station.
- The Lower Hunter will continue to maintain its market share in retirement living, especially along the coast line. However, as residential land values rise in these locations, retirees will have to look towards a 'tree change' (i.e. move inland) instead of 'sea change'.
- Home businesses should be permitted in residential zones.

By 2031, around 8,600 residents will live in Wyee, generating demand for around 20,000m^2 of retail space, however some of this demand will go to higher order centres and escape the Wyee trade area. Based on assumed capture rates, Wyee will demand around 6,000m^2 of retail floorspace upon full development, with an additional 1,500m^2 for non-retail tenancies and an allowance for vacancies.

Given there is only around 1,000m^2 of retail floorspace existing in Wyee, by 2031 there will be demand for some form of expanded local or village centre, possibly anchored by a large supermarket. A shopping centre of say 6,000m^2 to 7,000m^2 could be supported by the local population in Wyee depending upon retail mix – but it would need to capture the majority of regular or "chore" shopping trade generated. The suggested mix for an expanded retail centre in Wyee is:

- 2,500 to 3,000m^2 supermarket;

- 2,000 to 2,500m^2 specialties (15-18 shops); and
- 1,000m^2 of non-retail commercial uses.

Note that the supermarket is expected to trade at no more than $20m to $24m. This is about $7,000 to $8,000/m^2 which is 15-20% below non-metropolitan averages. Hence if additional dwelling yields are lower than 2,000 it will put in jeopardy the viability of the retail centre. To improve the viability of the centre the specialties should include a liquor store, chemist, newsagent, butcher, hairdresser and at least two fast-food/café's or restaurants.

In 2007, there was still 80.24ha of vacant industrial land available in Lake Macquarie LGA. 40% (32ha) of this vacant land was in Morisset, a relatively short distance (9km) from Wyee. Furthermore, employment lands growth on the Central Coast is expected to be focussed on the proposed Wyong Employment Zone (360ha), and that remaining area identified as being part of the North Wyong Structure Plan (125ha). Together, these sites are expected to generate around 7,000 jobs and $1.9b worth of investment.

Morisset, Bushells Ridge, Charmhaven, Hakone Employment Corridor, North Wyong, and the Wyong Employment Zone are all within close proximity to Wyee, totaling some 1,229ha of employment lands. As a result, employment opportunities are limited in Wyee itself. Morisset (as well as Lake Haven, Tuggerah and Warnervale in the future) provides a more attractive location for agglomeration of higher order retail, industrial and business employment uses and community services and will continue to do so in the foreseeable future.

Given the size and population of Wyee, its proximity to Morisset, Warnervale, Charmhaven, and Lake Haven, and given the scale of future employment lands planned for in these areas, there is no need to provide industrial or business park type development in Wyee.

The lack of any base industries in Wyee means that it is likely that residential will remain the highest and best use of land in the local area. Proposed residential land uses for the subject site include:

- 1,100 residential dwellings across the subject site.
- Larger lots with single detached dwellings and affordable product will be viable in Wyee.
- The potential for medium density development (e.g. townhouses) exists adjacent or near the train station.
- The Lower Hunter will continue to maintain its market share in retirement living, especially along the coast line. However, as residential land values rise in these locations, retirees will have to look towards a 'tree change' (i.e. move inland) instead of 'sea change'.
- Home businesses should be permitted in residential zones.

Given the significant forecast supply of industrial and employment lands in both Lake Macquarie and Wyong LGA's to 2030, it's considered that other competing locations better serve industrial land in the local area. There may be some demand for local service industries in the Wyee local area, however they are likely to co-locate with similar services in Morisset and the like where they have access to a wider catchment of customers.

8 Apportionment of Additional Infrastructure & Servicing Costs

8.1.1 Local Infrastructure

Development contributions provide councils with a funding mechanism to meet the additional demand for local and community infrastructure generated by development.

The EP&A Act sets out the legislative provisions for the levying of development contributions by local councils. Mechanisms include contributions under Section 94 Contributions Plans and Planning Agreements. Other mechanisms, outside of the EP&A Act, to allow consent authorities to require developers to provide public infrastructure include:

- Contributions to water supply authorities for the provision of water management works under Division 5 of Part 2 of the Water Management Act 2000.
- Requirements for a developer to carry out works under section 80A(1)(f) of the EP&A Act.

When determining the most appropriate form of contributions mechanism to use Council will need to consider:

- The rate and pattern of development in the area
- The nature of the infrastructure required; and
- The financial and staff resources of the council.

On 4 June 2010, the NSW Government announced a revised approach for setting local development contributions and local council rates. Following this announcement, further extensive consultation with stakeholders has been undertaken. A Department of Planning Circular issued on 16 September (PS10-022) states that as a result, a number of new measures will be introduced to accelerate housing and keep downward pressure on prices. These include:

- $20,000 cap per dwelling or per residential lot in existing areas
- $30,000 cap per dwelling or per residential lot in new release (greenfield) areas to recognise the higher costs of creating well-planned communities in these areas
- a list of essential infrastructure that will apply to contributions plans over the relevant caps will be set
- a $50 million Priority Infrastructure Fund for projects on the essential works list above the cap will be established

Planning agreements can be required as a condition of development consent, but only if a voluntary offer is made by the developer to enter into such an agreement. There is

therefore no level of certainty provided with such a mechanism, as it is completely at the discretion of the developer whether they wish to adopt this approach.

Planning agreements are beneficial in the following circumstances:

- In relation to a major development site or precinct that is owned a single land owners or a consortium of land owners;
- Where the owner or owners have an incentive to be directly involved in the delivery of community infrastructure;
- Where the owners want to provide community infrastructure additional to, or at a higher standard than, what has been specified under the contributions plan; or
- A council and the developer(s) can, by negotiation, achieve different and better or more innovative outcomes than can be achieved through imposing contributions.

8.1.2 State infrastructure contributions

It is the policy of the State Government that State infrastructure contributions only fund attributable infrastructure and land requirements to support newly developed land rather than infrastructure requirements driven by general population growth. This ensures a more consistent approach in setting infrastructure contributions across NSW. State infrastructure contributions:

- address development in State contributions areas;
- are for the provision of public infrastructure;
- are imposed as a condition of consent;
- are determined by the Minister, with the concurrence of either the Treasurer or Secretary of the Treasury, in consultation with stakeholders;
- can be subject to a requirement for arrangements satisfactory to the Director- General; and
- can be created, repealed or changed by the Minister in consultation with the Treasurer.

Based on a policy decision taken by the State Government where State contributions apply to greenfield areas identified in Regional or Subregional Strategies, the Metropolitan Development Program or approved local strategies, the contribution will be sought to fund up to 75% of the following attributable State infrastructure costs:

- roads,
- land for:
  - emergency services and justice,
  - health,
  - education, and.
  - conservation.
- planning and delivery.

8.1.3 Preferred Option

A planning agreement would be an appropriate contributions mechanism for parts of the site, and in particular Area A of the subject land. As previously discussed however, a planning agreement cannot be relied upon, as it is a voluntary mechanism. It will therefore be necessary to implement a Section 94 Contributions Plan for the area, which may be supplemented by a planning agreement at a later stage, should this be desired by the developer. It is likely that the Section 94 Plan would include both monetary contributions as well as land/asset dedication.

The RTA have advised of the desire for the developer to enter into a planning agreement for contributions towards road infrastructure.

The Section 94 Contributions Plan should be developed in parallel with the master plan for the site and ensure that the necessary open space, recreation and infrastructure is provided to service the site. Should a planning agreement be entered into at a later stage, it would outline which provision of the Section 94 Contributions Plan did not apply.

9 CONSTRAINTS & OPPORTUNITIES

The following sections discuss the overall constraints and opportunities present on the site, as identified from the technical investigations and review of relevant legislation and planning controls. Figure 9-1illustrates the key constraints identified on the site.

9.1 Opportunities

Wyee has been identified in strategic documents as an area for urban expansion. The rezoning and future development of the site provides a number of opportunities, including:

Locational Benefits – The subject site is adjacent to the existing township of Wyee and the associated social and community infrastructure. It is situated close the railway station and has good access to to larger centres for employment and retail.

Economic Opportunities – The rezoning would provide additional population which would increase the commercial viability of Wyee businesses. A number of construction jobs will also be created from future development.

Social Opportunities – Rezoning and development of the subject site will provide for significant areas of public open space and future development will include provision of additional social and recreational facilities.

Servicing – The proposed rezoning can access existing and proposed servicing infrastructure in the immediate vicinity. Some upgrades and augmentation to existing services is required. Lack of access to sewerage infrastructure has inhibited development in the area to date. The rezoning of the land may provide a further catalyst to assist in securing the necessary funding for provision of this infrastructure.

Road Infrastructure – The development of the subject site will make use of existing road infrastructure providing connectivity to the existing road network. Some upgrades will be required.

Lack of Constraints – The site includes large areas of previously cleared land available for development, with no loss of prime agricultural land, and significant flood free areas suitable for development.

9.2 Constraints

The technical studies prepared as part of the LES have identified various constraints over the subject site (Figure 9-1). The identified constraints include:

Flooding – parts of the site along Mannering Creek and along the western boundary are subject to the 100 year ARI.

Ecological – the ecological assessment has identified two endangered ecological communities (EECs) on the site (Freshwater Wetlands and Swamp Schlerophyll Forest).Two threatened flora species (*Tetratheca juncea* and *Angophora inopina*) were identified as occurring on the site. Both these species are also listed as vulnerable under the EPBC Act. Six threatened fauna species were identified on the site (Squirrel Glider, Glossy Black Cockatoo, Grey-headed Flying Fox, Eastern Freetail Bat, Little Bent-wing Bat and Large-eared Pied Bat). A large area of squirrel glider habitat has been identified to the west of the train station and a significant number of hollow bearing trees were also identified on the site. Based on these constraints, the site was divided into high, medium and low ecological constraint areas. This is shown on Figure 9-1 and is also illustrated in Figure 5-7.

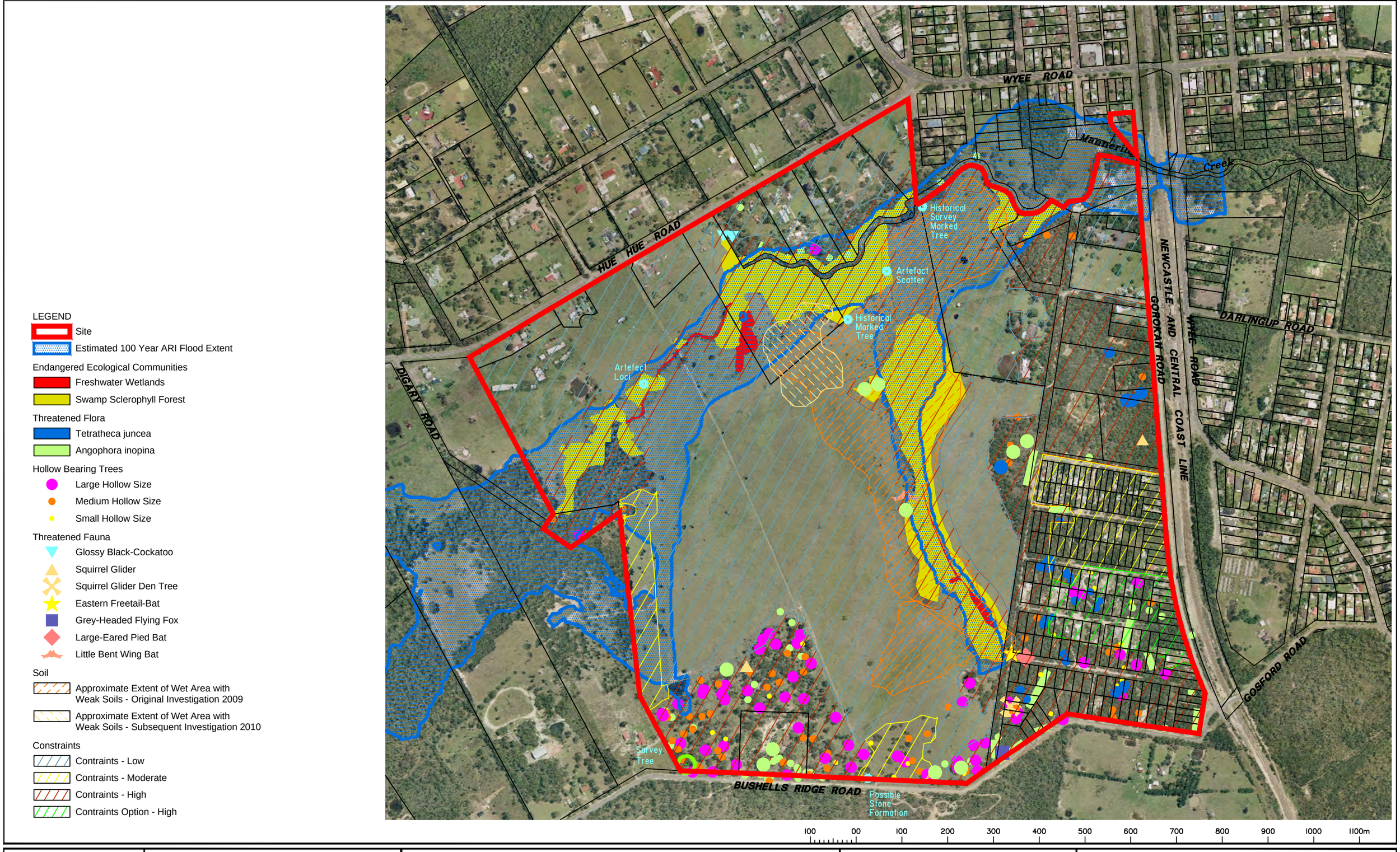
Bushfire – the subject site is within a bushfire prone area. A bushfire impact assessment has been prepared as part of the draft LES and has concluded that the future development of the area can comply with the *Planning for Bushfire Protection Guidelines*. Future investigations would need to undertaken for any proposed development.

Geotechnical & Soils – the geotechnical and contamination assessment identified that the site is generally suitable for residential development. Some weak soils were identified within the lower, wet areas of the site. This may have an impact on construction associated with future development and some further geotechnical works would need to be conducted at the development application stage. In addition, some filling is present on the site which would need to be investigated further prior to development.

Traffic and Access – in order to accommodate future development on the site, upgrades would most likely be required to intersections at Wyee Road/Gosford Road and Wyee Road/Gorokan Road. Bushells Ridge Road would require realignment to improve safety for access to the site.

Sewer & Water – the site is currently unsewered and provision of new sewer infrastructure is required to service the anticipated population growth of Wyee. Significant upgrades to the existing water supply system will also be required to service the future population growth.

Paper subdivision – the paper subdivision located in the south eastern corner of the subject site presents some challenges to the rezoning. Unauthorised development in this area has resulted in small lot residential properties without access to services such as reticulated water and sewer. There are also social considerations for the rezoning of this land.



Level Datum	Date	11 OCT 2010	CLIENT **LAKE MACQUARIE CITY COUNCIL**
Origin NORTH	Comp By.	BJS / KCH	
	DWG Name.	MA08342_CONSTRAINTS	
	Local Authority	LAKE MACQUARIE C.C.	*CONSTRAINTS PLAN*
Scale 1 : 7500 / Sheet A3	Locality	WYEE	
	Job Reference	MA08342	

PROJECT **WYEE**

Plan Ref **MA08342-103** | Rev

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10 Land Use Options

10.1 Land Suitability Assessment

The findings of the LES indicate that:

- Wyee is identified in the Lower Hunter Regional Strategy as a major urban release site, with the potential to provide up to 2000 dwellings
- a mixture of residential, conservation and open space zones would be most appropriate for the site
- flooding is a major constraint on the site, although some of the affected land can most likely be developed with appropriate design and management at construction stage
- extensive ecological constraints exist across the site and DECCW would need to be consulted on any proposed vegetation removal
- industrial or business park development is not necessary in Wyee as supply will be high in surrounding areas, such as Wyong and Morisset
- access to the site is constrained by sight distance along Bushells Ridge Road and intersection upgrades will be required to accommodate future development
- provision of sewer infrastructure and water supply upgrades are required for the proposed future population in Wyee
- the site is generally suitable for development from a geotechnical and contamination perspective, however some further investigations will be required
- the site is affected by bushfire, however future urban development of the study area has the capacity to comply with the *Planning for Bushfire Protection Guidelines 2006*

The environmental, social and economic impacts of the development have been assessed. Part of the site is considered suitable for urban land use and can be rezoned accordingly. Part of the site is considered suitable for recreation or conservation purposes only. Despite this, any development outcomes on the site may vary depending on discussions with DECCW regarding offsetting of vegetation that is to be removed.

As detailed above, the key constraints to urban development on the site are ecology and flooding. In determining which areas of the site were unsuitable for development, a number of land suitability criteria were applied to the site, as detailed in the table below.

Table 10-1: Land Suitability Criteria

Criteria	Response
Land identified as high ecological constraint	Land identified as high ecological constraint should be zoned for conservation. It should only be developed in circumstances where the economic and social benefits would outweigh the environmental benefits.

	Where it is proposed to rezone high ecological constraint areas for urban land uses, it would need to be justified based on appropriate protection of other areas of the site and options for offsetting should be explored.
Land identified as moderate ecological constraint?	The suitability of such land for development should be based on a consideration of the nature of the ecological constraint, the level of protection of other similar areas within the site and the strategic importance of the site in terms of access to transport and the services of the existing Wyee township.
Land identified as low ecological constraint?	Land identified as low ecological constraint should generally be zoned as suitable for urban development, except when other constraints (i.e. flooding) exist on the land.
Land identified as flood prone?	Land identified as being affected by the 100 year ARI should only be developed where it can be demonstrated that it can be appropriately managed in the layout and design of development. This would include flooding as a result of overland flow.
Other constraints present on the land that would impact future development?	Where other constraints, such as archaeological deposits, bushfire and contamination exist on land, it should be considered whether they are likely to place restrictions on future development and whether they could be appropriately managed within an urban environment.

10.2 Zoning Options

In identifying the most appropriate zonings for the site, a number of issues have been considered. In particular, Clause 5(a) of the EP&A Act has been considered, as well as economic, social and environmental considerations.

Consideration has also been afforded to:

- the proximity of the site to the railway station and existing township and the potential to provide for transport oriented development
- population targets identified in the Lower Hunter Regional Strategy
- the ecological, flooding and other constraints of the land
- the social and economic impacts of developing the site, including impacts on the paper subdivision
- the requirement for recreational facilities to service the future population of Wyee
- access issues.

The economic assessment identified that residential development would be the most appropriate land use for the site. The assessment did identify the requirement for an additional 4500 to 5500m^2 of retail land and 1000m^2 of commercial land in Wyee to service planned population growth in the town as a whole, however the Wyee Structure Plan identifies that the existing Wyee town centre should be the focus for retail development. While consideration was given to including a business/commercial zone adjacent the railway station, this was considered inappropriate and may adversely impact on the town centre. The inclusion of a 2(2) zoning adjacent the station would allow for a range of development which could fulfil the retail and service requirements of the future

population on the site, without adversely impacting the existing town centre. This is considered further in Table 10-2.

A number of rezoning combinations were considered for the site, particularly in relation to the areas adjacent the train station and on the eastern boundary of the site. There is significant conflict in this area given its ecological importance as squirrel glider habitat and a wildlife corridor and also its strategic importance in terms of provision of transport-oriented development.

Two zoning options for the site have been developed. Table 10-2 discusses each of these options and provides a basis for the proposed approach.

Option 1 is illustrated in Figure 10-1 and seeks to capitalise on the strategic importance of the land for future development, both in terms of the proximity to the train station and the State government identified need for growth in Wyee. This option would require significant biodiversity offsetting, but would deliver a greater density of housing in an important strategic location in accordance with State policy.

Option 2 is illustrated in Figure 10-2 and proposes a higher level of conservation than the first and is generally consistent with Council's *Biodiversity Planning Policy and Guidelines for LEP Rezoning Proposals*. It would not require significant biodiversity offsets prior to development and seeks to protect the vast majority of land identified as high ecological constraint. This option does not, however maximise the potential of the land in close proximity to the train station and does not acknowledge State policy in relation to Wyee as a growth area.

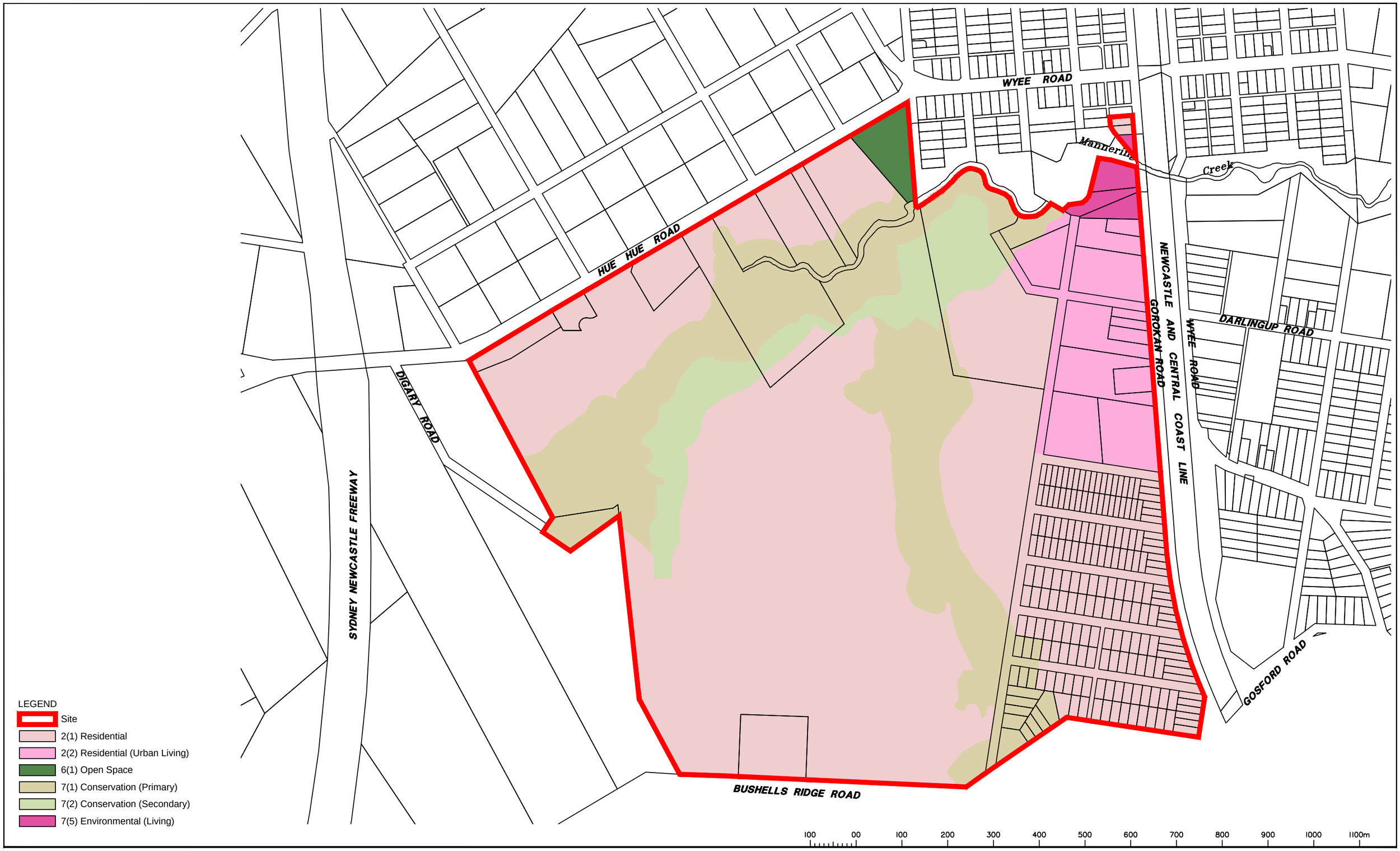
There are a number of areas where the proposed zoning is consistent between Options 1 and 2. This is mainly in relation to the conservation zonings associated with Mannering Creek and the tributary and the approach to rezoning in the paper subdivision.

Table 10-2: Zoning Options

ZONE*	EQUIVALENT ZONE**	OPTION 1	OPTION 2
2(1)	R2	The proposed 2(1) zoned land in Option 1 predominantly comprises land identified as low ecological constraint and land that is unimpeded by the impacts of flooding. It does comprise a number of areas of land identified as moderate and high ecological constraint, including a large area on Bushells Ridge Road, an area along the western boundary and the majority of the 'paper subdivision' in the south east. Significant offsetting will be required in order to develop these areas of land. The resulting zoning would allow for 3 large areas of 2(1) zoned land which would provide the opportunity for a well designed, connected residential area which maintains good road and rail access. Unlike Option 2, Option 1 does not provide for a second north-south vegetation corridor (zoned conservation) adjacent to the riparian corridor along the Mannering Creek tributary. This is identified as a strategic corridor in the Wyee Structure Plan, however would result in the isolation of developable land between the two corridors. Development of the 2(2) node (see below) would result in the fragmentation of this corridor in the north of the site. Removal of the vegetation corridor could be offset by enhancing the riparian corridor further west and improving links to Mannering Creek. The majority of the paper subdivision (apart from a small section of the riparian corridor in the south-western section of the subdivision which is currently zoned 7(2) and is proposed to remain as such) has been included within the 2(1) zone. Part of the paper subdivision has been identified as comprising land of high and moderate ecological constraint due to the presence of a number of threatened species and hollow bearing trees. Much of the area, however, is also relatively disturbed as a result of development associated with the paper subdivision. The southern section of the subdivision has remained relatively undeveloped. It has been identified as land comprising high ecological constraint given the identification of a number of threatened species (flora and fauna) and the presence of hollow bearing trees. The proposed approach to rezoning in the paper subdivision is discussed in detail in Section 10.3.1 below. It is understood that a proposal for industrial development exists for land to the immediate south of the paper subdivision. This was considered in the final zoning options, however given the separation distance between the two areas, it is considered that there is a sufficient buffer to allow for residential development. Two areas identified as land of high and moderate ecological constraint located on Bushells Ridge Road are included within the 2(1) zone. These areas comprise a large number of hollow bearing trees and a smaller number of threatened species. While it is recognised that the vegetation in this area provides important habitat for squirrel gliders and other hollow dwelling fauna, the vegetation is sparse and is in relatively poor condition. This area has been identified as the preferred location for the water reservoir (being the high point on the site) and one of the access points to the site, which would require the removal of some of this vegetation. Development of this area, with appropriate offsetting, could potentially provide for a significant number of dwellings in an area that is otherwise unconstrained. An area of land along the western boundary of the site has been identified as having moderate ecological constraints, despite being cleared and predominantly unvegetated, and is affected by flooding as a result of overland flow in this location. The identified ecological constraint is based on the provision of a wildlife corridor along the western boundary of the site. It is considered that the adjoining land to the west – which is currently vegetated and appropriately zoned 7(2) – would provide a more appropriate wildlife corridor. The water management report has identified the potential to pipe the overland flow path along the western boundary so that this area can be utilised for urban development. This is discussed in Section 5.2. On this basis, this portion of the site has been included in the 2(1) zone.	The proposed 2(1) zoned land in Option 2 also predominantly comprises land identified as low ecological constraint and land that is not affected by flooding. Like Option 1, it also comprises land that has been identified as moderate to high ecological constraint. The main difference between the proposed 2(1) zoning in Options 1 and 2 is in relation to the provision of a second vegetation corridor to the east of the Mannering Creek tributary, as well as the exclusion of land along Bushells Ridge Road (identified as high ecological constraint). Option 1 includes these areas of land within the 2(1) zone, whereas Option 2 does not. Instead Option 2 includes a 7(1) zoned corridor along the western boundary of the paper subdivision, linking to Mannering Creek (see below). It proposes the majority of the paper subdivision be included within the 2(1) zoned land. The large area of land identified as high ecological constraint along Bushells Ridge Road is proposed as 7(2), on the basis that it comprises a significant number of hollow bearing trees and a number of threatened species. Like Option 1, Option 2 proposes the inclusion of land identified as moderate ecological constraint on the western boundary and on Bushells Ridge Road in the 2(1) zone. The basis and justification for the inclusion of these areas is the same as for Option 1.
2(2)	R1 (note that R3 was considered	Option 1 incorporates a relatively large node of 2(2) zoned land adjacent the railway station. The 2(2) zoning in this location encompasses the majority of land within 400m of the train station and is considered strategically significant in this regard. It is also highly accessible to the Wyee town centre. The land is currently zoned predominantly 7(5) Environment Living and 6(1) Open Space. Parts of the land have been identified as having low ecological constraint and are not affected by flooding and therefore represent a logical location for higher density urban development. Part of this land, however, has been identified as being highly constrained ecologically. It forms a part of "Fragment E", a large tract of land identified as important Squirrel Glider foraging area. There are also a small number of hollow bearing trees and identified threatened species present in this location.	Unlike Option 1, Option 2 does not propose the rezoning of all land in the vicinity of the train station as 2(2). It includes the area of land adjacent the station that is unconstrained by flooding and ecology, but only a small portion of the highly constrained "Fragment E". This approach recognises the importance of this area in terms of both its strategic location adjacent the railway station and its role as squirrel glider habitat and seeks a balance between the two. It allows for a reasonably sized development node adjacent the railway station, but also protects the majority of the squirrel glider habitat. Threatened species and the hollow bearing tree identified within "Fragment E" fall outside the proposed 2(2) zone and a substantial north-south corridor would be maintained through the site. The rezoning and future development of this portion of the land would also require consultation with

ZONE*	EQUIVALENT ZONE**	OPTION 1	OPTION 2
		Despite the ecological constraints, this portion of land is of strategic importance and provides an opportunity to provide for urban development in close proximity to the railway station. This is discussed in more detail in Section 10.3. The rezoning and future development of this portion of the land will require consultation with DECCW and Council to negotiate options for offsetting.	DECCW and Council to negotiate options for offsetting.
6(1)	RE1	Option 1 has identified an area of land along Hue Hue Road for public open space. The general approach with the zoning options in the LES has been to avoid identification of public open space zones at this stage, as it is more appropriate to consider locations at the detailed master planning stage. This site, however, has been identified by Council as a strategic location for open space, given that it is adjacent the existing facilities and adjoins Mannering Creek. This is recognised in the Wyee Structure Plan.	Option 2 does not incorporate any open space zones, which are generally better determined at the master planning stage of development when indicative layouts and road networks have been decided. The 7(1) and 7(2) zones allow for provision of recreational facilities, and it is likely that these areas would be dedicated to Council as part of any future development (in accordance with a VPA).
7(5)	E4	Two small areas of land have been proposed for 7(5) zoning. Lot 9 DP 1058113, Lot 8 DP 1020857, Lot 4 DP 1013240 and Lot 1 DP 103856 in the north eastern portion of the subject land are currently occupied by dwellings, however are affected by flooding and are in close proximity to Mannering Creek. In order to restrict the intensification of development on these lots, a 7(5) zoning has been proposed. This approach is consistent between the Options 1 and 2.	
7(1)	E2	The riparian corridor along both Mannering Creek and the tributary have been proposed to be zoned 7(1). This approach is consistent between both Options 1 and 2 and will ensure the protection of the two EECs identified on the land. In order to allow connectivity between the residential zones on the site, roads will need to be a permitted use in this zone. They are currently permitted in the 7(1) zone and would also need to be included as a permitted use in E2.	
7(2)	E3	There is an area along Mannering Creek which falls outside the identified riparian corridor and is identified as land comprising low ecological constraint, but which is affected from flooding. This area of land provides some opportunity for passive recreation and has been included within the 7(2) zone. In particular, it would allow for pedestrian/cycle connectivity along Mannering Creek, linking the proposed residential areas with the train station. This approach is consistent between Options 1 and 2.	

* *Lake Macquarie Local Environmental Plan 2004* ** *Standard Instrument*



Level Datum	Date	11 OCT 2010	CLIENT **LAKE MACQUARIE CITY COUNCIL**
Origin NORTH	Comp By.	KCH	
	DWG Name.	MA08342_CONSTRAINTS	*OPTION 1 PREFERRED ZONING PLAN*
	Local Authority	LAKE MACQUARIE C.C.	
Scale 1 : 7500 / Sheet A3	Locality	WYEE	PROJECT **WYEE**
	Job Reference	MA08342	Plan Ref **MA08342** / Rev

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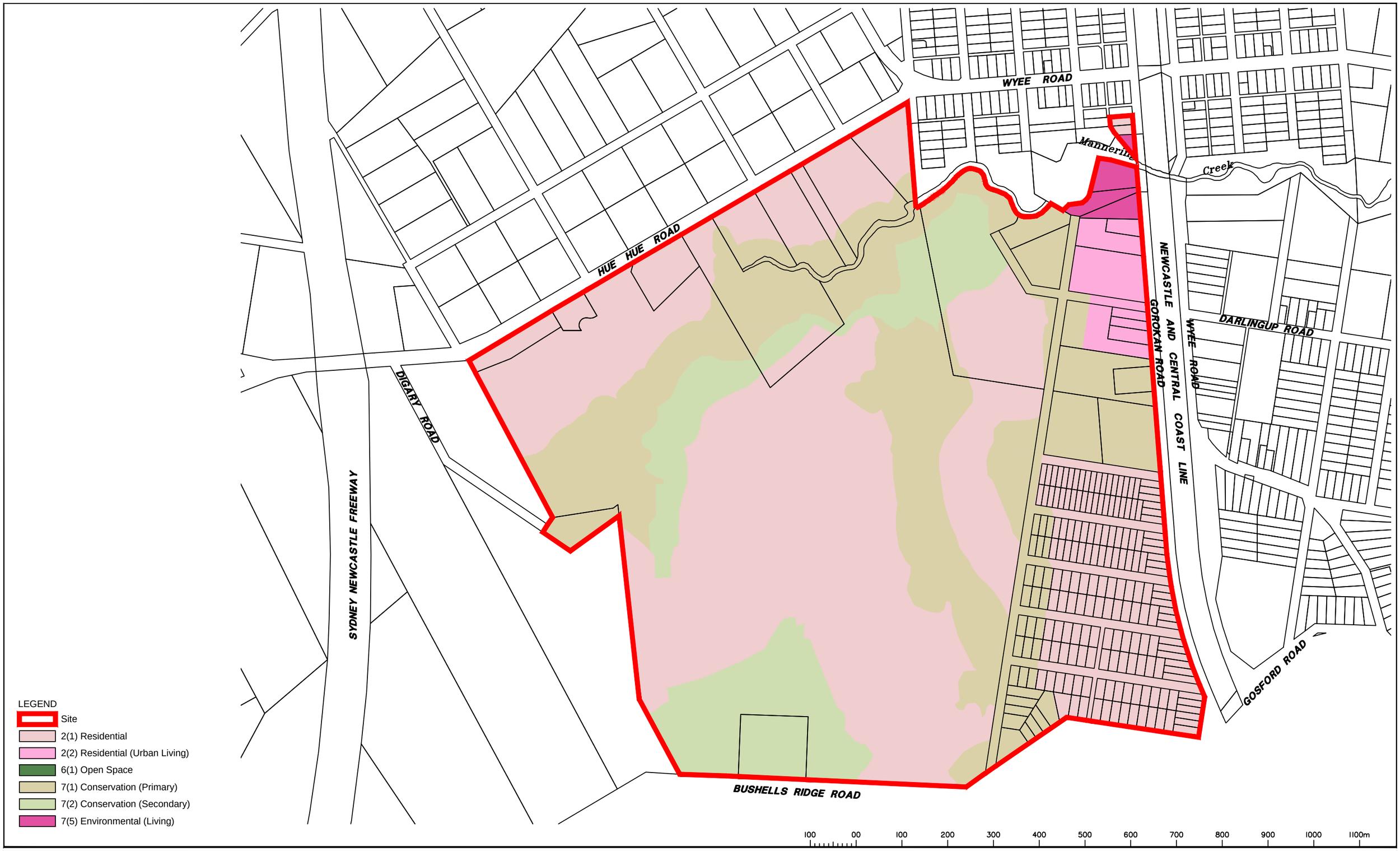

Level Datum	Date	11 OCT 2010	CLIENT **LAKE MACQUARIE CITY COUNCIL**
Origin NORTH	Comp By.	KCH	
	DWG Name.	MA08342_CONSTRAINTS	
	Local Authority	LAKE MACQUARIE C.C.	OPTION 2
Scale 1 : 7500 / Sheet A3	Locality	WYEE	
	Job Reference	MA08342	

PROJECT **WYEE**

Plan Ref **MA08342** | Rev

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10.3 Preferred Land Use Strategy

The preferred zoning has been identified to ensure that the zones are appropriate to the site within the context of the current LEP provisions. It is proposed to zone the site to incorporate the following zones:

- 2(1) – Residential Zone
- 2(2) – Residential (Urban Living) Zone
- 6(1) – Open Space Zone
- 7(1) – Conservation (Primary) Zone
- 7(2) – Conservation (Secondary) Zone
- 7(5) – Environmental (Living) Zone

Based on the assessment of key environmental, social and economic issues along with the consideration of relevant planning legislation and the principles of ESD, Option 1 (Figure 10-1) is considered to present the most appropriate zoning option for the site.

This option acknowledges the identification of Wyee in the Lower Hunter Regional Strategy as a growth area and seeks to capitalise on the strategic location of the land in relation to the train station and the existing Wyee township. The site has the potential to contribute a significant proportion of the dwelling target identified for Wyee in a location in close proximity to transport and services. While this will result in the future development of some areas of ecologically significant land, there are significant areas of the site proposed for conservation and biodiversity offsets would ensure the appropriate protection of habitat elsewhere.

While it is apparent the land has high conservation value, housing pressures in the area will continue to rise and the value of this land from a strategic perspective could outweigh the conservation value in this instance. Seeking a higher yield on the subject land will avoid the need to identify sites less suitably located and without the same access to transport and services in order to achieve the dwelling targets for Wyee.

Section 7.5 of the LES discusses the social impact of the future development and issues with accessibility. It states that Wyee has relatively good access to commuter transport, with connections to Sydney, Gosford and Newcastle from the rail station. It remains, however, a highly car dependent town. The township itself is relatively disconnected from the train station and development of a higher density node in this area would assist in alleviating this issue. This approach has been considered and discussed in the Wyee Structure Plan

The social impact assessment identifies the need to investigate options to further reduce car dependence, given the social impacts associated with it. Such impacts include poor health and high levels of obesity in the community. A significant proportion of household income is also used to run and maintain motor vehicles.

The importance of transport-oriented development has been acknowledged in various State, Regional and local strategic planning policies and guidelines, as discussed in Sections 3 and 11.

10.3.1 Paper Subdivision

The paper subdivision presents particular challenges, due mainly to the ecological constraints apparent in this area and the social equality and servicing issues associated with the rezoning.

The paper subdivision is currently zoned predominantly 1(1) Rural Production, with a small portion in the south west zoned 7(2) Conservation (Secondary). There were four key options considered for the rezoning of the paper subdivision: "do nothing", rezone as residential, rezone as environmental conservation or rezone as a combination of conservation and residential. The preferred option proposes the latter, the basis for which is outlined below.

- On the basis that the land is already subdivided into relatively small allotments, a conservation zone would have little benefit and it would be difficult to manage future development on these lots. Much of the area has already undergone unauthorised development for housing and comprises moderately disturbed vegetation. This trend will more than likely continue.
- It is proposed to retain the 7(2) zoned land in a conservation zone given its importance as a link between the riparian areas of Mannering Creek and tributary and land to the south in Wyong LGA.
- Retaining the existing zoning was not an option, as the land is not viable agricultural land and ownership is highly fragmented, thereby limiting the potential for agricultural pursuits. There would be no benefit in retaining the existing zoning.
- The majority of the paper subdivision is within 800m of the train station and represents a suitable location for residential development.
- There are benefits associated with provision of additional residential lots to cover the cost of servicing development on the subject land.

The social implications associated with each of these options are addressed in Table 10-3. Each option has benefits and costs and there is no single option that will "resolve" the issue of the paper subdivision and result in no social, environmental or economic impacts. The final recommendation takes into account all relevant factors to ensure an orderly use of the land that addresses the objects of the EPA Act s5.

Table 10-3: Social Implications of Paper Subdivision Options

Option	Description	Potential Impacts
1. Do Nothing	Subject land retain existing land use zone and level of servicing; and residents continue their existing tenure	• The challenges for the individual landowners particularly those challenges related to security of housing are not addressed • The challenges for the wider community are not addressed particularly in the short term, for example, environmental impacts of ad hoc servicing and illegal works and in the long term the potential degradation of land with high ecological value • There are opportunity costs from the land not being developed as either residential development or

		environmental protection • Existing positive emotional connection and sense of community may continue • Stakeholder and community expectation that challenges will be resolved are not fulfilled
2. Rezone whole of paper subdivision as residential	Subject land is zoned to allow residential development consistent with state, regional and local planning	• Land use zone is not a barrier to individual landowners addressing challenges particularly those related to security of housing • Land use zone is not a barrier to the challenges for the wider community being addressed • The land contributes to residential targets in the area and reduces need for surrounding communities to absorb residential development • May create a perception in the wider community that speculation and illegal works have been rewarded and legitimised • All current landowners in the subject area are treated equally • Mechanisms for delivering services (including funding) to existing dwellings will need to be devised • Economies of scale may exist that allow infrastructure to be privately funded • Potential economic gain for all existing landowners in the subject area • There are environmental impacts and opportunity cost of not developing in accordance with the ecological values of the land
3. Rezone whole of subject areas as environmental	Subject land is zoned to protect the ecological communities consistent with state, regional and local planning	• Opportunity cost from not developing land as residential development • Increases need for surrounding communities to absorb residential development • Development compatible with ecological values of the land can be realised over time • Possible economic loss and foregone expenditure by current landowners
4. Rezone with a mix of residential and environmental	Part of subject land is zoned to allow residential development and part is zoned to protect ecological communities consistent with state, regional and local planning	• May be perception that some landowners in the subject area have been given preferential treatment • May create a perception in the wider community that speculation and illegal works have been rewarded and legitimised • Potential economic gain for some existing landowners in the subject area • Some increased need for surrounding communities to absorb residential development • Land use zone is not a barrier for some landowners in addressing challenges particularly those related to security of housing • Opportunity cost from not developing some of the land as residential • Sufficient economies of scale may not exist to privately fund infrastructure • All landowners in the subject area may benefit from some of the infrastructure provision (e.g. improved roads)

The preferred land use strategy has adopted Option 4 in the final proposed layout. Most of the paper subdivision is ecologically significant, to varying degrees, however

much of it is highly disturbed and will continue to be impacted by human occupation. The proposed rezoning seeks to retain the existing conservation zone in the south-western portion of the paper subdivision, however the remainder of the lots are proposed for inclusion in the 2(1) zone. This is considered an equitable approach for all landowners.

The rezoning seeks a balance between the social, economic and environmental issues pertaining to the paper subdivision. It is acknowledged that there will be some financial costs associated with servicing the paper subdivision and this will need to be considered by Council.

10.4 Preliminary Yield Analysis

A preliminary yield analysis was carried out based on the preferred land use strategy (Table 10-4). It provides a crude indication of the potential future population associated with development of the site (in accordance with the preferred zoning option).

The density and yields used in the analysis was based on the following:

- an average target of 12 dwellings per hectare, as identified in the Lower Hunter Regional Strategy (note that this was adopted for both the 2(1) and 2(2) zones on the basis that the 12 dwellings/ha is an *average* target for the LGA)
- no yield on land proposed for open space or conservation zones 7(1) or 7(2)
- actual number of lots for land proposed as 7(5) zone (on the basis that no further development would be possible).

Table 10-4: Preliminary Yield Analysis (Zoning Option 1)

Zone	Area (ha)	Density	Yield
2(1)	99.24	12dwellings/ha	1190.88
2(2)	12.97	12dwellings/ha	155.64
7(5)	1.58	4 (actual yield)	4
7(1)	35.36	0	0
7(2)	9.80	0	0
6(1)	1.62	0	0
		Total Yield	**1350.52**

10.5 Management Recommendations

It is imperative that prior to development on the site, a detailed master planning exercise be undertaken to inform the preparation of a site specific develop control plan (or potentially a Part 3A Concept Plan) for the site. The master plan may require further detailed investigations to help inform the layout design and management options for the site.

As a minimum, the following issues should be addressed in the master plan.

Table 10-5: Management Recommendations

ISSUE	RECOMMENDATION
Traffic, access and site configuration	The master plan will need to identify appropriate access points and a preliminary street layout. This will need to carefully consider connectivity between parcels of urban zoned land and the impact of roads in conservation zones. Access through conservation land should be minimised and selected based on a consideration of the level of impact to wildlife corridors. It should also consider the appropriateness of existing road reserves on the site.
Infrastructure	The master plan will need to identify appropriate locations for the water supply reservoir, stormwater detention and any required sewer infrastructure. An Infrastructure Servicing Strategy for the paper subdivision should be prepared, including details of funding and implementation responsibilities.
Open Space	The master plan should identify additional sites for public open space which are integrated within the residential zones. This will need to provide for the required level of open space identified in the Social Impact Assessment. The potential for some of the 7(1) and 7(2) zoned land to contribute to the required target should be considered.
Conservation Zones & Offsetting	Opportunities for offsetting the removal of vegetation should be investigated as part of the master planning process. Preparation of a management plan for the riparian zones should be prepared, which includes revegetation and rehabilitation. The management plan should also investigate bushfire management. The potential for a VPA in relation to the riparian corridor should be investigated, with the developer undertaking necessary works outlined in the management plans prior to dedication of the land to Council.
Bushfire	The master plan should be prepared based on the provision of any bushfire asset protection zones outside of conservation zones and within private land. The street layout should also consider the requirements of *Planning for Bushfire Protection 2006*.
Design principles	Design principles for future medium density residential and low density residential should be prepared which seek to promote a high quality built form which is sympathetic to the existing township and surrounding bushland.
Landscaping	The findings of the visual impact assessment should be reviewed to assist in the preparation of landscape principles for the site. The use of locally endemic species should be encouraged.

11 Planning & Environmental Considerations

11.1 Ecologically Sustainable Development

Clause 5 of the EP&A Act states that one of the objects of the Act is to encourage ecologically sustainable development (ESD). The preferred option is considered consistent with the principles of ESD and management options for the future development of the site will play a role in encouraging ESD. This is discussed in the table below.

Table 11-1: Ecologically Sustainable Development

ISSUE	RESPONSE
Protect and enhance the natural environment	Significant areas of bushland and ecologically significant land have been protected within conservation zones in the preferred option. Management options recommend that these areas be enhanced and rehabilitated as part of any future development. Some areas of bushland are proposed to be rezoned to allow for urban development, however this is considered acceptable given that the majority of land identified as being highly constrained ecologically has been protected in conservation zones and the rehabilitation of these areas to provide high quality habitat assists in offsetting the loss. The preferred land use strategy protects all EECs, the large majority of threatened species identified and most hollow bearing trees.
Protect and enhance functioning of waterways	Significant riparian corridors around Mannering Creek and the tributary have been protected in conservation zones and should be rehabilitated as part of any future development. A stormwater strategy has been considered for the future development and water sensitive urban design should be implemented. Future development should also consider the utilisation of recycled water systems and rainwater tanks. Flood prone land has been generally excluded from development in the proposed land use strategy.
Promote public transport and other alternative modes of travel	The preferred land use option seeks to capitalise on the site's proximity to the Wyee train station. It recommends development of a higher density node surrounding the station. The proposed public open space zone will allow for a pedestrian/cycleway to encourage sustainable methods of transport within the future development.
Contamination	Any contaminants identified in detailed future studies should be removed and the site remediated at DA stage.
Waste	Waste recycling during construction and operational phases of development should be ensured through the preparation of appropriate waste management plans.
Energy	The preferred land use strategy will enable a lot and street orientation that promotes solar access. Future development should be as energy efficient as possible and incorporate various measures to minimise energy consumption.

11.2 LES Specifications

As per the specifications for preparation of the LES provided by the Department of Planning, this study has been prepared taking into account current strategic planning documents, policies and other statutory considerations. The study has also considered and assessed environmental, social, economic issues.

The following table identifies where the LES addresses each of the requirements outlined in the LES Specification.

Table 11-2: LES Specifications

LES SPECIFICATIONS	Addressed In
Description of the study site and surrounds including real property description, land area, ownership, existing uses, surrounding land uses and proximity to the town and facilities.	Section 2
Consideration of the regional planning context including state and regional policies, Section 117 Directions, the Hunter Regional Environment Plan, Lower Hunter Regional Strategy, Draft North Wyong Structure Plan and Lake Macquarie Lifestyle 2020 Strategy.	Sections 3 and 4
Flora and fauna assessment, including management of impacts on habitat; high conservation value vegetation communities, habitat linkages and fauna movement corridors, Threatened Species (under Threatened Species Conservation Act and Environment Protection and Biodiversity Conservation Act).	Section 5.3
Bushfire risk management, including level of hazard, the guidelines contained in "Planning for Bushfire Protection" and asset protection zones and levels of construction as well as demands on existing fire fighting services.	Section 5.4
Hydrology drainage, storm water, and water quality management including local and catchment drainage characteristics area subject to tidal or flood inundation, terrain features (such as intermittent or perennial watercourses and other water bodies) as applicable.	Section 5.2 to 5.6
Assessment of slope, solid and geotechnical characteristics, including salinity, potential acid sulphate soils, instability, soil erosion potential, land contamination and mine subsidence as applicable.	Section 5.1
Potential land use conflicts with mining operations on land to the south of the release area, in Wyong LGA	Section 3.2.5 and Table 10-3.
Scenic Visual Impact Assessment including topography, landforms, natural terrain, landscape units, visual prominence and views from public places.	Section 5.5 and 5.9
Aboriginal and European heritage assessment including review of Register of National Estate and State Heritage Inventory, statutory heritage items or conservation areas, special landscape or historical values, Aboriginal archaeology, artifacts, relics and sites, cultural or spiritual values to Aboriginal people and consultation with local Aboriginal organizations.	Sections 5.6 and 5.7
Traffic and infrastructure assessment including examination of the existing road networks and it capabilities for increased demands, interconnection with exiting development, access to public transport and availability of services such as water, sewer, gas, electricity and communications, as well as funding arrangements for State and Regional infrastructure.	Section 6
Social impact assessment which incorporates an understanding of the exiting and future needs for community facilities and strategies for integration with the	Section 7 and Appendix 11

existing community	
Incorporation of the findings of the Wyee Development Conservation and Servicing Strategy.	Table 10.5

11.3 State Environmental Planning Policies (SEPPs)

This section identifies those SEPPs relevant to the site and discusses the consistency of the preferred land use strategy with these policies.

Table 11-3: Consistency with State Environmental Planning Policies

SEPP	Comment
SEPP 19 – Bushland in Urban Areas	The proposed land use strategy identifies the protection of a large proportion of bushland and sensitive ecological land within the site. Development on the site will need to address the 'maintain and improve' test.
SEPP 44 – Koala Habitat Protection	Flora and fauna studies prepared for the subject site have not identified 'potential koala habitat' as defined under the provisions of this SEPP.
SEPP 55 – Remediation of Land	A geotechnical and contamination study has been conducted across the subject site. There are some minor geotechnical constraints across the site, particularly the presence of weak soils in some low lying areas. All geotechnical issues can be addressed at the DA stage.
SEPP – Major Development	This SEPP may apply to the subject site at the DA stage depending on the final development outcome.
SEPP – Infrastructure (2007)	This SEPP may apply depending on the final development outcome, and consultations with the RTA and HWC will be required at the DA stage. Nonetheless, a traffic study has been prepared for the subject site in accordance with RTA requirements, which identifies that the existing road network could handle up to 250 lots. Some upgrades of unsealed roads in the area may be required to be sealed. The RTA will have further opportunity to examine the traffic assessment and therefore, the upgrades identified in the assessment.
SEPP – Mining, Petroleum and Extractive Industries	DPI have noted that the subject site is within an existing coal mining lease area, however, it is considered unlikely that any extraction of this resource is likely to occur on, or under, the subject site that would warrant the area to be excluded from any development potential.

11.4 Section 117 Directions

Table 11-4: Consistency with Section 117 Directions

S117 DIRECTIONS	COMMENTS
1.2 Rural Zones	The LES proposes rezoning land from rural to urban in a manner consistent with the Lower Hunter Regional Strategy. The land is not of high agricultural significance.
1.3 Mining, Petroleum Production and Extractive Industries	The site is located within an area covered by a petroleum exploration licence. The Department of Primary Industries wish to ensure that access is maintained for gas exploration, and petroleum exploration over the entire area. Such activities are undertaken in accordance with the Petroleum (Onshore) Act, and there are directional methods which can be employed to avoid impacts on surface development.

1.5 Rural Lands	The LES proposes changes to rural zoning and to environmental conservation zones. The proposed changes are consistent with the Lower Hunter Regional Strategy, and any changes to conservation zones will be supported by ecological investigations.
2.1 Environmental Protection Zones	An ecological assessment has been prepared for the subject site which identified flora and fauna issues and recommendations for conservation and corridors. The preferred land use strategy identifies a significant area for environmental protection, which contains endangered ecological communities and threatened species. From a planning perspective the preferred land use strategy is not inconsistent with this Direction, although further discussions with DECCW will need to occur regarding vegetation removal.
2.3 Heritage Conservation	The proposal is consistent with the objectives of this Direction. The subject site has been assessed by Archaeological and heritage consultants. The survey identified two locations of artefact scatters, along the margins of Mannering Creek and three historic blazed trees, two located on the southern margins of Mannering Creek and one in the south western corner of the study area. These issues should not impede a rezoning but will need to be considered in preparing a future DA. It is likely that they will be listed as heritage items on the LEP as part of the rezoning process.
2.4 Recreation Vehicle Areas	The objective of this direction is to protect sensitive land or land with significant conservation values from adverse impacts from recreation vehicles. No recreational vehicle areas are proposed as part of the rezoning.
3.1 Residential Zones	The LES seeks to encourage higher intensity development in areas of high transport activity at the railway station and in areas with good access to existing services in the village centre. The location of the site benefits from access to the existing infrastructure available to the Wyee township, although some augmentation will be required. The provision of sewer reticulation has been investigated as part of the LES and will assist the provision of medium density housing.
3.2 Caravan Parks & Manufactured Home Estates	The LES has considered the most appropriate land use for the site based on a through investigation of site attributes and features, as well as relevant planning policy. In terms of permitted land uses, this is something that will be determined as part of Council's new LEP process and this direction will need to be considered then.
3.4 Integrating Land Use and Transport	The LES seeks to encourage higher intensity development in areas of high transport activity at the railway station and in areas with good access to existing services in the village centre. An area of public open space provides the opportunity for a cycleway and pedestrian network linking future development with the train station.
4.1 Acid Sulfate Soils	The presence of acid sulphate soils on the site is considered unlikely, however further testing should be undertaken in areas identified as "weak soils" at the DA stage.
4.2 Mine Subsidence and Unstable Land	The site is not located in a Mine Subsidence District and the Mine Subsidence Board raised no objections to the proposed rezoning in the Section 62 consultations.
4.3 Flood Prone Land	This Direction states that Council should consider the NSW Government Flood Prone Land Policy and Floodplain Development Manual in assessing the proposal. The preferred land use strategy has identified a small portion of flood prone land as developable. It is considered that this area of land can be appropriately managed during construction to provide flood free development land. This would need to be further investigated at DA stage.

4.4 Planning for Bushfire Protection	Council have consulted with the NSW Rural Fire Service who has raised no objections to the rezoning. A Bushfire threat assessment was prepared for the subject site which considered Planning for Bushfire Protection, however, bushfire threat assessments will need to be prepared at DA stage.
5.1 Implementation of Regional Strategies	The LES is consistent with the strategic direction set by the Lower Hunter Regional Strategy, by providing for additional residential land to meet the population projections outlined in the strategy.
6.1 Approval and Referral Requirements	This LES has been prepared in accordance with the EP&A Act. Appropriate assessment has been undertaken in accordance with relevant plans, policies and guidelines.
6.2 Reserving Land for Public Purposes	The LES proposes to rezone existing public open space for the purposes of development, however provides for additional public open space in alternative areas on the site. It is considered that the proposed rezoning represents the best use of the land and provides sufficient and appropriately located open space for future populations.

11.5 Local Plans & Policies

The preferred land use strategy is consistent with local plans and policies. As identified in Lifestyle 2020 the subject site reinforces the existing township of Wyee, manages the city's environment and protects the City's heritage and economic resources. The development identified in the preferred land use strategy does not affect the hierarchy of urban centres in Lake Macquarie. Wyee is likely to benefit from the proposed development economically and socially.

The preferred zoning plan has been prepared after giving due consideration to the opportunities and constraints of the subject site, and identifying the most appropriate zones from the current LEP. It is considered that the preferred land use strategy provides a balanced approach to development on the site after considering the principles of ecologically sustainable development. Future development will need to be consistent with development controls and policies.

The preferred land use strategy is not inconsistent with Council's scenic guidelines.

The following table illustrates the consistency of the preferred option with the relevant principles of the draft Wyee Structure Plan.

Table 11-5: Consistency with draft Wyee Structure Plan

Principles	Comment
P1.1 Wyee will continue to exhibit the visual and aesthetic character of a rural village.	The large areas of land proposed for conservation combined with the predominantly low density residential zoning will assist in maintaining the rural character of the township.
P1.3 More detailed co-ordinated development masterplans should be produced for each development precinct at their rezoning stage.	A master planning exercise should be undertaken for the site following rezoning. This has been included as a recommendation of the LES.

P1.4 Wyee will continue to serve a market niche for larger suburban lots, but there will also be smaller lots and medium density housing in locations adjacent to the railway station, the village centre, and neighbourhood parks.	The proposed rezoning comprises a range of residential zones, including low density residential and provision for higher density development adjacent the train station.
P1.6 Precinct 4, west of the railway station, should be the first area to be released for urban development (subject to detailed study). It may provide up to 1000 lots, which is around half of the growth target identified for Wyee under LHRS to 2031. The location of this land, its apparent suitability for urban development, and its ability to deliver a development of sufficient magnitude to facilitate the extension of sewerage services to Wyee, make it the priority for urban investigation.	This LES has investigated the potential for urban development on part of Precinct 4. It has concluded that large parts of the site are suitable for urban development and initial investigations conclude that the site could provide approximately 1350 lots.
P1.7.1 The future development path for the "paper" subdivision in Precinct 4 should be determined in relation to its role within the larger urban development area of Precinct 4, particularly in relation to conservation and servicing issues.	The ecological, social and economic implications of rezoning the paper subdivision have been considered. It is proposed to rezone the area to a mix of conservation and residential zones based on a balanced consideration of these issues.
P1.8 More intensive urban development, including mixed-use, is desirable near the railway station and the village centre. It should be guided by an Area Plan (within the Lake Macquarie Development Control Plan No.1), possibly with controls for minimum densities.	A 2(2) zone has been identified for land adjacent to the railway station, which would allow for medium density residential development and some small scale retail and services.
P2.1 Development in Wyee should be consistent with the maintenance of the significant habitat corridors that form either part of the subregional corridor network or which provide important links between smaller pockets of native vegetation and large areas of bushland.	Important corridors along Mannering Creek and its tributary have been retained as conservation zones in the proposed zoning layout.
P2.2 The boundaries of Endangered Ecological Communities (EECs) should be more accurately defined on a site-by-site basis, in conjunction with detailed flora and fauna surveys.	These have been investigated and mapped as part of the detailed ecological assessment.
P2.3 Development in Wyee should consider any impacts on habitat corridors to the south, in Wyong Shire.	The proposed rezoning maintains strong vegetation connections with land to the south in Wyong Shire.
P2.4 The corridor network around Wyee should be linked to the network in the Spring Creek area to the south, in Wyong Shire.	See above.
P2.5 Three riparian corridors: Wyee Creek, Swampy Creek, and Mannering Creek, should be conserved and rehabilitated in recognition of their habitat and landscape value. Development should seek to mimic natural wetting and drying cycles.	Riparian zones around Mannering Creek the tributary on the site have been protected in conservation zones in the preferred land use strategy.
P2.6 Buffer areas of 20m width should be provided to EECs. Asset protection areas for	These areas have been identified as high ecological

bushfire management, stormwater devices, and road infrastructure should be outside of these buffers.	constraint and are proposed as conservation zones.
P2.8 Detailed studies should be undertaken of the land zoned 6(1) Open Space, to the west of the railway station (Precinct 4), to confirm its conservation significance and its role within the habitat corridor network. Because of its location adjacent to the railway station, this land has a potential role as a site for intensive urban development depending on the confirmation of its conservation role and status.	This parcel is proposed to be rezoned for urban purposes to permit more intensive urban development in proximity to the railway station. This is discussed in Section 10.2.
P2.9 Any road link proceeding westwards from the railway station area into Precinct 4 should preferably take the form of an extension of Darlingup Road.	Two potential access points on the eastern boundary of the site have been identified, one forming an extension to Darlingup Road.
P2.12 Detailed surveys of the riparian areas on a site-by-site basis in conjunction with the Department of Water and Energy are required to refine the widths of riparian buffers.	Significant riparian buffers are proposed, which also incorporate flood prone land. These are consistent with requirements of DECCW (formerly DWE).
P2.14 More detailed, site-specific flora and fauna surveys are required, particularly in the areas where development potential has been identified.	An ecological assessment has been undertaken for the site.
P3.6 The provision of community services and facilities should be in accordance with Table 1, derived from the service standards adopted by LMCC. The standards of provision are drawn from the Lake Macquarie Section 94 Contributions Plan No.1 – Citywide (2004), and shown for the projected population of Wyee (8,000) in 2031.	The social impact assessment has considered what standards are appropriate for the site and has concluded that Council's standards (as listed here) are appropriate. Refer to Section 7 and Appendix 11.
P4.5 A "town park" should be developed near the existing community centre, and linked by a shared cycleway/pedestrian route to the potential sporting facilities to the south.	Public open space zones have been proposed in appropriate locations throughout the site. The majority of public open space should be identified as part of the detailed master planning for the site.
P6.10 A detailed traffic study is required as part of the rezoning study for each development precinct to ensure that adequate provision is made for the upgrading of the road network, including intersections, and that funding provision is made, such as through Section 94 developer contributions.	A traffic assessment has been prepared and is provided in Appendix 9.
P7.3 A new local park (0.5ha) will be required to serve the potential urban development in Precinct 4, directly west of the railway station. Future development around the transport node may be medium density development, and in this case, the need for a local park within this area will be essential.	Locations of public open space would be determined as part of the detailed master planning for the site.
P7.4 A new neighbourhood park (1.5ha) to serve the future urban area in Precinct 4 is required. This area could be provided in the south of the potential urban area, or	See above.

incorporated with the proposed sporting facilities south of Mannering Creek.	
P7.5 In addition to the above, an area (1.5ha) adjoining the existing community centre and recreation facilities should be provided to allow for the future expansion of these facilities, i.e. the skate park, children's playground, tennis courts, community centre, and adequate car parking for these facilities. A BMX track could be provided here or with the new sporting facilities.	Lot 324 DP 755242 adjacent to the existing community centre has been proposed to be included within the 6(1) zone. This lot is approximately 1.5ha. Facilities to be included on this land would be determined at the master planning stage.
P7.6 Feasibility investigations should be undertaken for a sporting complex of four fields and two netball courts in Precinct 4, to the south of Mannering Creek, as part of the rezoning investigations for the Precinct, provided there are no environmental constraints to this location. An area of land of at least 10.7ha (not including the riparian zone or wetlands) would be needed for sporting facilities (four fields) in Wyee, and south of Mannering Creek appears suitably located for this requirement.	Locations of public open space would be determined as part of the detailed master planning for the site.
P7.8 The provision of recreation and open space facilities should be in accordance with Table 2, derived from the service standards adopted by LMCC. The standards of provision are drawn from the Lake Macquarie Section 94 Contributions Plan No.1 – Citywide (2004), and shown for the projected population of Wyee (8,000) in 2031.	The social impact assessment has considered what standards are appropriate for the site and has concluded that Council's standards (as listed here) are appropriate. Refer to Section 7 and Appendix 11.
P8.1 A thorough investigation of Indigenous and European heritage should be undertaken prior to the rezoning and/or the development of new urban areas, and suitable measures should be taken to conserve or recognise the cultural significance of any sites or items so identified.	A Heritage Impact Assessment has been prepared for the site which identifies items of significance and recommends management mechanisms. This has been taken into account in the LES.
P8.2 The Bahtabah Local Aboriginal Land Council and traditional owner families should be consulted as part of any indigenous heritage investigations.	The Bahtahbah LALC were consulted with as part of the Heritage Impact Assessment.
P9.1 Any rezoning and/or development proposal should consider the impact of physical constraints on development, including, but not limited to, the constraints identified in the Wyee Structure Plan Background Report.	The LES has investigated all physical constraints present on the site, as per the brief provided by Lake Macquarie City Council.
P12.1 The desirability of rezoning the "paper subdivision" for residential purposes should be examined as part of rezoning investigations for urban land in Precinct 4.	The rezoning approach to the paper subdivision has been considered in the LES and recommendations have been made.
P12.2 The development of the "paper subdivision" should be undertaken as part of an integrated "masterplan" approach for Precinct 4, and not in isolation.	The preparation of a master plan for the site has been recommended as part of the LES. The master plan should include the paper subdivision.

11.6 Agency Consultations

The following table outlines how the issues raised by each of the agencies have been addressed in the LES.

Table 11-6: Agency Consultations

AGENCY	ISSUE
DEPARTMENT OF ENVIRONMENT & CLIMATE CHANGE (Now Department of Environment Climate Change & Water)	• Wildlife corridors have been maintained through the site. • Existing conservation zones on the site have been maintained and extended where appropriate. • An ecological assessment has been prepared for the site. • The LES has balanced up the environmental, economic and social impacts of the development in proposing land use zones for the site. Whether any proposed future development meets the maintain and improve test would need to be ascertained. • Significant air, noise or odour impacts are not anticipated as a result of any future development. • The ecological assessment prepared for the site has reviewed the relevant threatened species legislation applying to the site. • An archaeological assessment was undertaken for the site which identifies the significance and management options for the archaeological items identified on the site. • No DECC estates will be impacted by the proposal. • A contamination assessment has been prepared for the site. Any contamination issues can be addressed at DA stage. • A water management study has been prepared for the subject site. • Two threatened species listed under the EPBC Act were identified.
DEPARTMENT OF EDUCATION & TRAINING	The Section 62 response identified a requirement for a new primary school to cater for future development in Wyee. Since this advice, however, DET have advised that a new primary school will not be required in Wyee. A specific site has not been identified in the preferred land use strategy, however should the need arise in the future, a location for the school would be best determined at the master planning stage.
DEPARTMENT OF WATER & ENERGY (Now Department of Environment Climate Change & Water)	• The Water Management Report, ecological assessment and Geotechnical Report have considered relevant legislation and policies in relation to groundwater, water quality and impacts on waterways and riparian vegetation. No groundwater works are proposed at this stage and adverse impacts are not anticipated, however further investigations would be required at DA stage. • The site is not located within a gazetted Water Sharing Plan (WSP). • Surface water has been investigated in the water management and geotechnical investigations. The proposed conservation zones surrounding Mannering Creek and the tributary will provide sufficient riparian zones to comply with DWE Guidelines in terms of core riparian zones. • Groundwater, the potential impacts of future development and contamination on groundwater and the implications on any future development was investigated as part of the geotechnical and water investigations. Impacts on groundwater were not considered likely and monitoring not necessary. • No Groundwater Dependent Ecosystems have been identified in the

AGENCY	ISSUE
	investigations. • Water supply, farm dams and stormwater management has been considered as part of the LES. Detailed water management will be a consideration at DA stage.
DEPARTMENT OF PRIMARY INDUSTRIES (Now Industry and Investment)	Significant conservation areas are proposed around Mannering Creek and tributary. These are sufficient to satisfy the 50m DPI requirement. Any future petroleum extraction on the site would be dealt with through the Petroleum (Onshore) Act 1991. NSW Industry and Investment should be consulted during exhibition.
HERITAGE COUNCIL	The heritage study has identified four historic features - • An historic subdivision layout. • Three surveyed marked trees. The main recommendation in relation to the subdivision layout is to retain the road names of the subdivision within any future development. The survey trees have low archaeological potential and should be retained in situ if possible. It is also recommended that the survey trees are listed on Lake Macquarie City Council's Local Environmental Plan. If the trees are to be impacted by the proposed development it is recommended that more detailed photographic recording be taken of the trees prior to impact.
NSW HEALTH	• Reticulated water and sewerage supply is proposed and was investigated as part of the LES. • The Water Management Report has identified suitable stormwater management options to ensure protection of the waterways on the site. • Detailed design in terms of subdivision layout, energy and water saving strategies will be addressed at DA stage. • Environmental noise will also be addressed at DA stage. It is not expected to be a significant issue. • Access to public transport has been assessed on the traffic study.
HUNTER WATER	The Infrastructure Report has investigated suitable locations for a water reservoir to supply future development on the site. Consultation was undertaken with Hunter Water as part of the preparation of this report. Water and waste water supply and servicing strategies should be prepared following the rezoning.
RURAL FIRE SERVICE	A Bushfire Assessment has been prepared to assess the proposed rezoning. Further assessments will be required at DA stage.
ROADS & TRAFFIC AUTHORITY	A traffic study has been prepared in accordance with the RTA guidelines. Modelling has been undertaken to determine impacts (including cumulative impacts) on the surrounding area and required upgrades have been identified. No additional direct access onto Wyee Road has been proposed as part of the LES. The traffic report has been provided to the RTA, who have subsequently lifted their objection to the proposed rezoning and exhibition of the draft is now possible. In correspondence of 13 August 2010, the RTA provided the following comments: • A Voluntary Planning Agreement or Deed Containing Agreement must be entered into between the developer and RTA for contributions towards State public road infrastructure. This should be commenced as soon as possible. • Works-in-kind is preferred over cash contribution where works are deemed

AGENCY	ISSUE
	to be of community benefit. • Recommended upgrade measures for the future development will need to be investigated further and finalised in consultation with Council and the RTA. • Further assessment will be required at DA stage in relation to State planning policies and guidelines. • Noise will need to be considered in future development applications.
WYONG SHIRE COUNCIL	The LES has considered cross boundary issues with the Wyong LGA, including: • Provision of infrastructure • Traffic impacts (particularly Bushells Ridge Rd) and upgrade requirements • Proposed zonings and how they might link with development opportunities/conservation areas in Wyong LGA • Assessment of requirements for provision of community facilties and services • Potential land use conflicts with mining operations • Nth Wyong Structure Plan & Draft Central Coast Regional Strategy. A meeting was held on 10/03/2009 with representatives from Wyong Shire Council, Department of Planning, Department of Environmental, Climate Change and Water and Lake Macquarie City Council to discuss cross-boundary issues in relation to the North Wyong Structure Plan.

12 Conclusion

This local environmental study has been prepared to assess the potential for rezoning of land at Wyee, to the west of the railway station. The LES has concluded that the site is suitable for rezoning to part residential, part environmental conservation, part environmental living and part open space. Consideration has been afforded to available planning and environmental information, including feedback from government agencies.

The site is highly constrained in many places. In particular, flooding associated with Mannering Creek (and tributary), the presence of EECs and threatened species on the site and the paper subdivision have impacted on the final preferred zoning option over the land.

The site also benefits from its proximity to the existing Wyee township and associated services, including the Wyee railway station. The preferred zoning option on the site has sought to capitalise on the location and foster a future development pattern that will support the existing township and locality generally.

Servicing the site with sewer and upgrading the existing water supply will be required prior to any development of the land. Recommendations for an appropriate servicing strategy have been outlined in the LES. Likewise, intersection upgrades and some road realignments will be required to accommodate any future development on the site and these have been addressed.

Prior to any development of the land, it is recommended that a detailed master planning exercise be undertaken over the site. This master planning exercise should identify an appropriate internal road network, identify locations for the water supply reservoir, stormwater detention and any required sewer infrastructure, investigate opportunities for biodiversity offsetting, identify appropriate locations for further pubic open space within residential zones and provide detailed design principles for future development. In addition, an Infrastructure Servicing Strategy for the paper subdivision should be prepared, including details of funding and implementation responsibilities.

It is considered that the preferred zoning represents a balanced approach to development of the site and offers the best outcome in terms of environmental, economic and social impacts.