6.5.5 Flooding

Flood risk and future potential

The subject land has been confirmed by Council to be partially flood prone. The land which is identified as being flood prone is demonstrated by the following flood prone land map (**Figure 56**). The majority of the development occurs on elevated land and as such is located outside the 1 in 100 year flood extent.

Only part of stage 2 is affected by the 1 in 100 year flood level, at the north western extent of the recently constructed stormwater channel. The current flood prone area includes seven allotments with part or all of each lot located below the 1 in 100 year flood level, as well as part of the internal road network along its interface with the environmental protection area. The development proposes partial filling of the site to raise the allotments above the 1 in 100 year flood level. The extent of filling for this area of the site is proposed to be up to a maximum of 2.5 metres above the current natural ground level, at the lowest point.

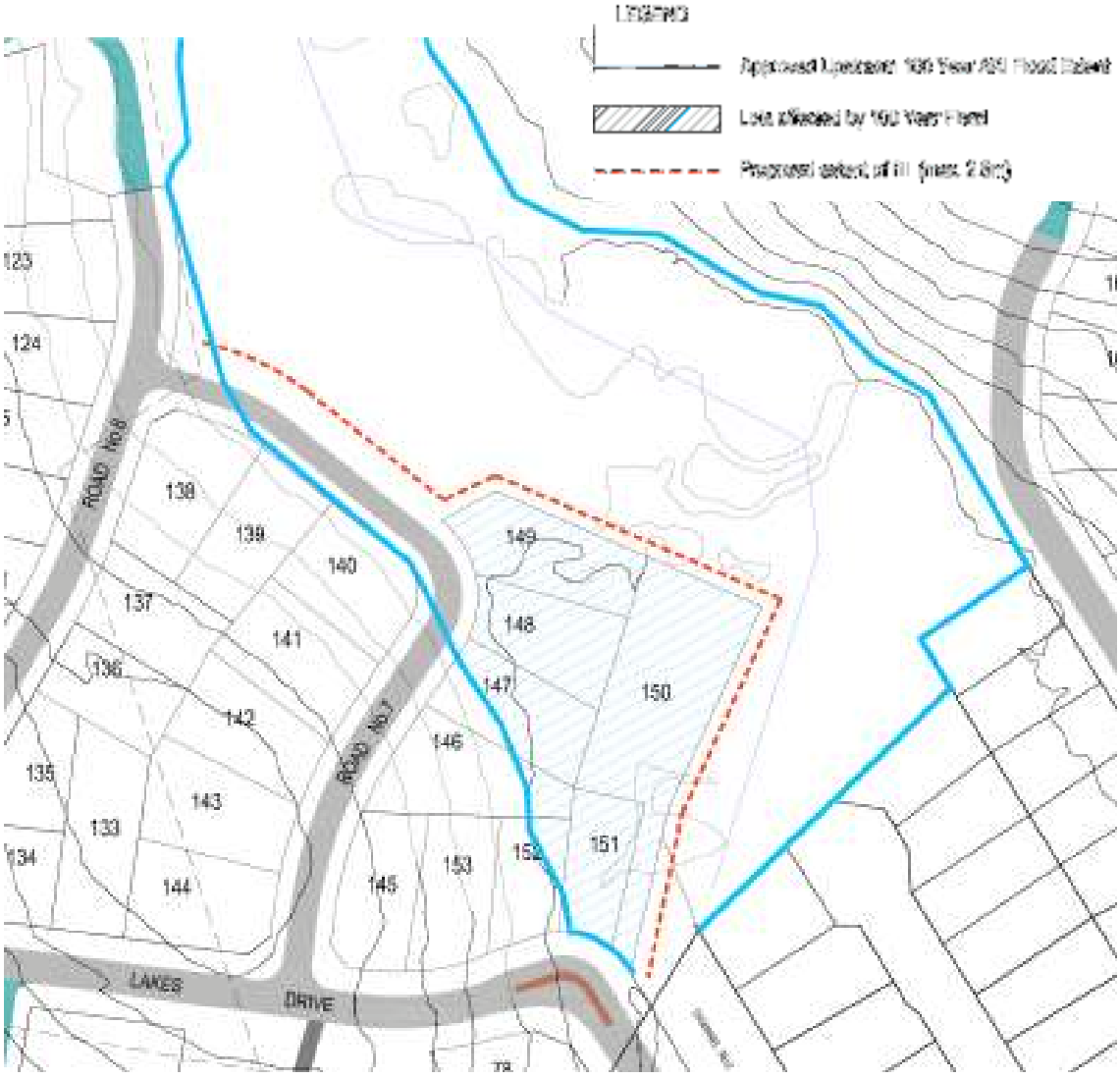

Figure 55 - Extent of existing flood prone land within the subject land

The extent of flood prone land within stage 2 is considered negligible and future dwellings are likely to be sited outside the identified flood extent.

The subject land is within close proximity to Boambee Creek and Newports Creek. The Pacific Oceans is located around 3 to 4 kilometres east of the subject land, and the Boambee Creek inlet to the Pacific Ocean is measured at 7.5 kilometres from the subject land. The peak flows and flood levels of the surrounding system are controlled by the channel downstream and culvert configurations and levels at North Boambee Road and Pacific Highway. As such, water levels in the surrounding area are largely controlled and the potential flooding risk of the subject land is controlled by these factors.

The *Floodplain Risk Management Guideline – Practical consideration of climate change* ("FRM Guidelines") prepared by DECC provides a tool to assess the 1potential impacts of climate change. The FRM Guidelines suggest that the sea level of the NSW Coast is expected to rise between 0.18 to 0.91m between 2090 and 2100, which is greater than the estimated global mean. The key changes in this instance are potential for sea level rise caused by climate change and potential increased frequency of storm events and subsequent precipitation. Both elements have potential to result in substantial increases in flood events.

Based on the controlled nature of the surrounding creek and river system, and the large distance from the Pacific Ocean inlet, the potential increase in intensity and frequency of flood events impacts as a result of climate change are considered negligible.

Modelling has been undertaken within the Stormwater Constraints Assessment attached at Appendix FF. The modelling utilised a 30 per cent increase in peak rainfall and storm volume, as recommended by the FRM Guidelines. The modelling determined peak flows and velocities within the development would increase with a peak 30 per cent increase in rainfall intensity and storm volume. Despite this, the peak flood levels within the development areas were determined to be less sensitive at around 150 millimetres in the eastern catchment and 100 mm in the western catchment. Based on the modelling undertaken, it is recommended all dwellings be proposed with a constructed freeboard of 500 millimetres above the determined 1 in 100 year flood level as determined by Council. This provision is made with a long term aim of preventing impacts associated with long term climate change.

Overall, the site is relatively undulating and includes areas of steep slopes, specifically in the ranges of 20 per cent or more. As such, the site is considered to be well drained and includes a five stage pondage and single wetland system to detain and release stormwater run-off. The minor extent of flooding on the site at present also suggests a limited change in flood extent should sea levels increase in the ranges suggested by the FRM Guidelines. The site also exists some distance from the coastal foreshore, and is considered at less risk than sites closer to the coastal frontage.

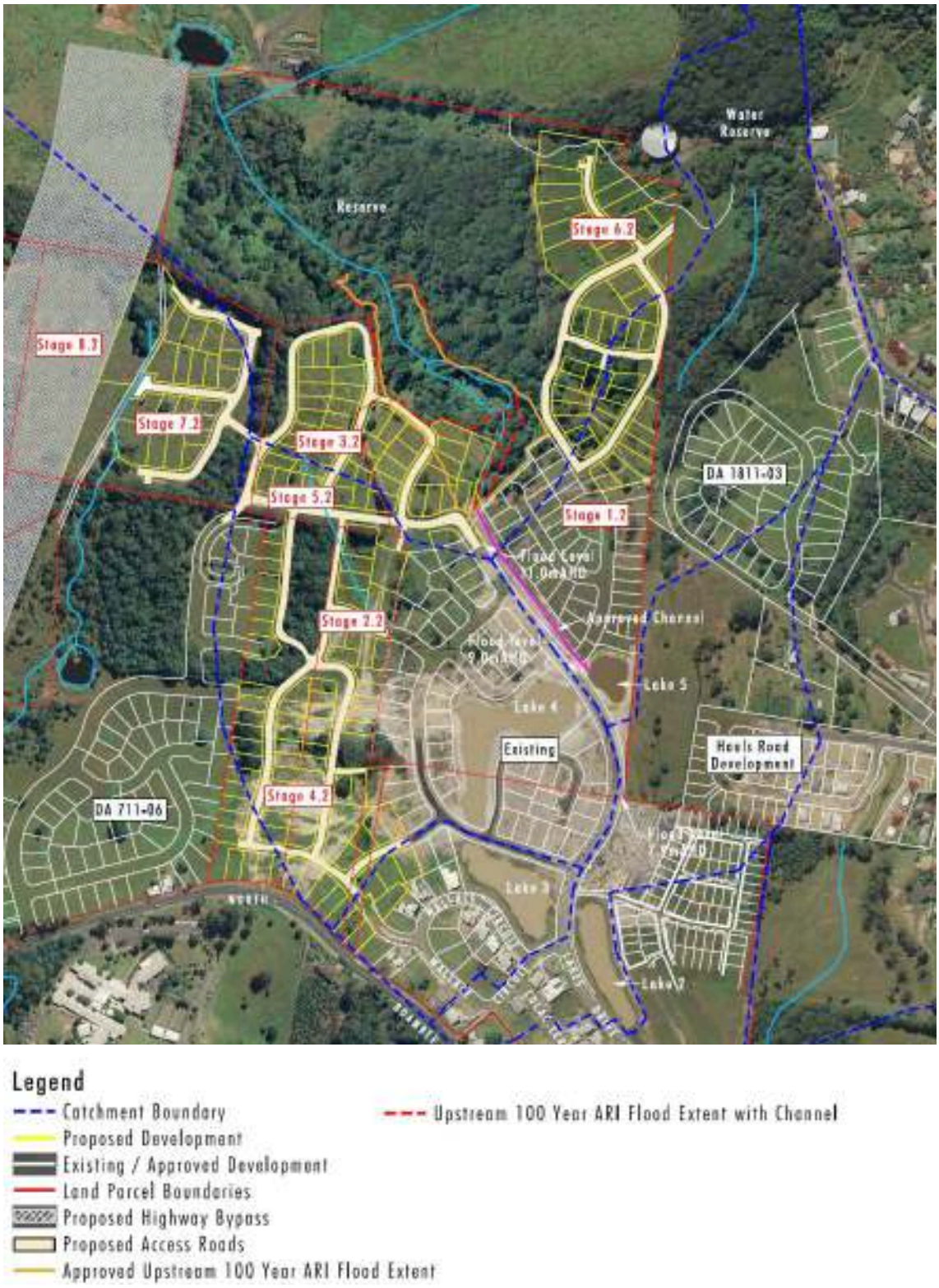

Figure 56 – Extent of flood prone land within the proposed subdivision prior to and following development and filling of site (Source: Umwelt Environmental Consultants 2008)

Impact to flood regimes

The channel to Lake 5 is proposed to be extended to collect flood waters from around stage 2 and reduce potential flooding to this location. Some minor filling will be undertaken across stage 2 to raise the development above the 1 in 100 year ARI and to allow the gravity reticulation system to function efficiently. The minor filling necessary for the site is not anticipated to greatly affect the flood regime of the subject land based on modelling undertaken within the Surface Water and Groundwater Assessment. The lakes and wetland detention system is considered adequate of accommodating much of the potential flood water and ensure post development outfall is not increased downstream. The modelling determined that some increases in flood levels upstream of the existing dam/pond may increase above the modelled pre-channel flood levels during the 1 in 100 year ARI storm by around 50 millimetres for a time period of around 15 minutes. To ensure the velocities of these increased flows remain below non-scouring levels, the Stormwater Constraints Assessment recommends that pool and riffle sequences be included in the channel design.

The Stormwater Constraints Assessment at Appendix FF and the Infrastructure Engineering Report at Appendix GG further demonstrate that flood regimes will not be affected by the proposed subdivision.

6.6 TRAFFIC MANAGEMENT & ACCESS

6.6.1 Traffic Impact Study

A Traffic Impact Assessment Report ("TIAR") has been prepared for the proposal to provide an assessment of the proposed increased traffic movements from the subdivision. The TIAR has been prepared in accordance with the RTA's Guide to Traffic Generating Developments, and estimates a total of 1,900 additional vehicles per day for the proposed subdivision.

The TIAR calculates the total number of allotments within the Lakes Estate locality to total 375; being 115 existing allotments under the early stages of the Lakes Estate, 190 proposed lots and an additional 70 lots proposed as part of the adjoining subdivision to the west of the subject land. This figure provides a total development figure for current development within the North Boambee Valley.

6.6.2 Impact on North Boambee Road & Pacific Highway

North Boambee Road provides the main link between the subject land and the Pacific Highway and is classified as a collector road. The road presents a sealed wide two lane surface operating as a semi-rural road. The road is limited to 60 km/h speed limit with 40km/h speed limits applied at the Bishop Druitt College. The TIAR identifies traffic flow along North Boambee Road at the Pacific Highway as 5,500 vehicles per day, with an AM peak (8 am – 9 am) of 710 vehicles and a PM peak (4.15 pm – 5.15 pm) of 335 vehicles. These figures generally correspond with the operation of the road as a 'collector road', which are generally designed to accommodate daily traffic flows of 3,000 to 6,000 vehicles. The TIAR suggests some variability in these figures given the land uses along the extent of the road, such as industrial land around the North Boambee Road/Pacific Highway intersection and the Bishop Druitt College further west. Farmland

exists further west and is not considered to generate particularly high levels of traffic. As such, the number of vehicles along the road is considered to vary significantly on a daily and hourly basis.

The Pacific Highway is classified as a National Highway and provides a divided two lane highway design, with its intersection at North Boambee Road controlled by traffic signals and sheltered left and right turning lanes. The Pacific Highway has been calculated to have daily vehicle movements of 40,000, with an AM peak of 3,200 and a PM peak of 3,000.

Lakes Drive provides the primary access point for the existing and proposed subdivision and links with North Boambee Road. The projected increase of traffic onto North Boambee Road is identified in the TIAR as 1,900 vehicles per day, with a peak hourly volume of 190 vehicles. This has been calculated on a maximum per lot traffic movement of 10 per day, and a peak hourly rate of 10% of daily traffic movement. The nature of non-metropolitan areas is such that limited public transport is provided, and the majority of residents utilise private transport.

The increase of traffic to North Boambee Road is predicted to increase up to 1,900 vehicles per day, with the majority of this traffic travelling west to the Pacific Highway given its function as a main traffic route to the Coffs Harbour CBD, retail and commercial locations, employment areas and adjoining townships. This figure is considered sustainable given the likely variability in traffic movements along North Boambee Road and the excellent structural condition of North Boambee Road. The intersection of the Pacific Highway is also controlled by traffic lights and allows effective management of traffic flows. The Pacific Highway by-pass to the west is likely to have a significant impact upon traffic movement at this node. It is anticipated traffic will reduce by around 15 to 20%, which will allow the increase in traffic generated by the proposed subdivision to be absorbed at the North Boambee Road/Pacific Highway intersection. A greater proportion of traffic from the subdivision is also likely to access the new Pacific Highway alignment to access surrounding townships and employment areas of Coffs Harbour.

6.6.3 Pacific Highway Planning Strategy

The *Pacific Highway Planning Strategy* ("the Highway Strategy") has been released by the RTA and has been considered by the proposed subdivision design. The Highway Strategy considered three alternatives for the Coffs Harbour Bypass corridor and determined the coastal corridor to be the most feasible alternative. This route extends along the western extent of the proposed subdivision and is shown as a hatched area on the proposed subdivision plans. A small portion western portion of Lot 10 DP1071628 is located on the western side of the freeway corridor and will be retained for future residential development.

The amended plan prepared for this project plan application is the result of discussions with the RTA during preparation of highway route options and are consistent with the preferred bypass layout as prepared by the RTA. The subdivision design is prepared in response to the location of the proposed highway corridor through the western portion of the land. The western allotments of the subdivision are buffered from the road corridor to permit sound mounding and/or barriers. These lots are also designed at larger sizes to allow dwellings to be established with adequate separation from the highway corridor.

Vegetation is proposed within the subject land to buffer the western allotments to the freeway. Additional vegetation and mounding is also anticipated within the highway corridor in addition to that provided within the subject land.

The impact of the proposed development on the Pacific Highway Planning Strategy is considered negligible given the design is in response to the preferred layout. The preferred design is considered to impact the proposed master plan for development of the North Boambee Valley, with the draft NBVDCP and master plan for North Boambee prepared with consideration of the coastal route. The proposed development and future development is therefore consistent with the preferred bypass route. The impacts of increased traffic movements within the surrounding area have been discussed within the TIAR, and all relevant issues have been discussed in greater detail above in regard to traffic impact.

6.7 DESIRED FUTURE CHARACTER & SUBDIVISION PATTERN/LAYOUT

6.7.1 Linkages to future & approved urban areas

The proposed subdivision layout expands upon the existing residential development of the Lakes Estate with meandering roadways and pockets of open space within the road reserve and subdivision design.

The adjoining subdivision, Highlands Estate, is under construction, and will link with the extension of Lakes Estate at the northern extent of the Highlands Estate. The Highlands Estate is indicated by a hatched line in **Figure 57** below.

The layout of the proposed Lakes Estate subdivision has had regard for the layout of the Highlands Estate and seeks to ensure a logical layout which integrates with the adjoining estate. The dense vegetation at the common boundary of the two subdivisions is linked, and the design of both estates seeks to retain all existing vegetation in this area to provide a habitat corridor through the site. This allows a consolidated habitat and remnant vegetation area.

Roads

In terms of road links, only one link is proposed with Lakes Drive at the northern extent of the Highlands Estate. This design provides an extension of the arterial road network and provides for a main arterial road network through both estates linking with North Boambee Road. It should be noted that the Highlands Estate has been designed with only one road linkage to the Lakes Estate.

Proposed road no. 1 within stage 3 is proposed to extend to the eastern boundary of the site. This design is proposed to allow potential future integration and connection with development to the east and north east. At this stage, road no. 1 will be constructed with a turning head at its north eastern extent, which will ensure appropriate access to the proposed subdivision, while allowing potential linkages to future development.

Figure 57 - Highlands Estate shown in context to the proposed subdivision (Source: CPG Australia 2009)

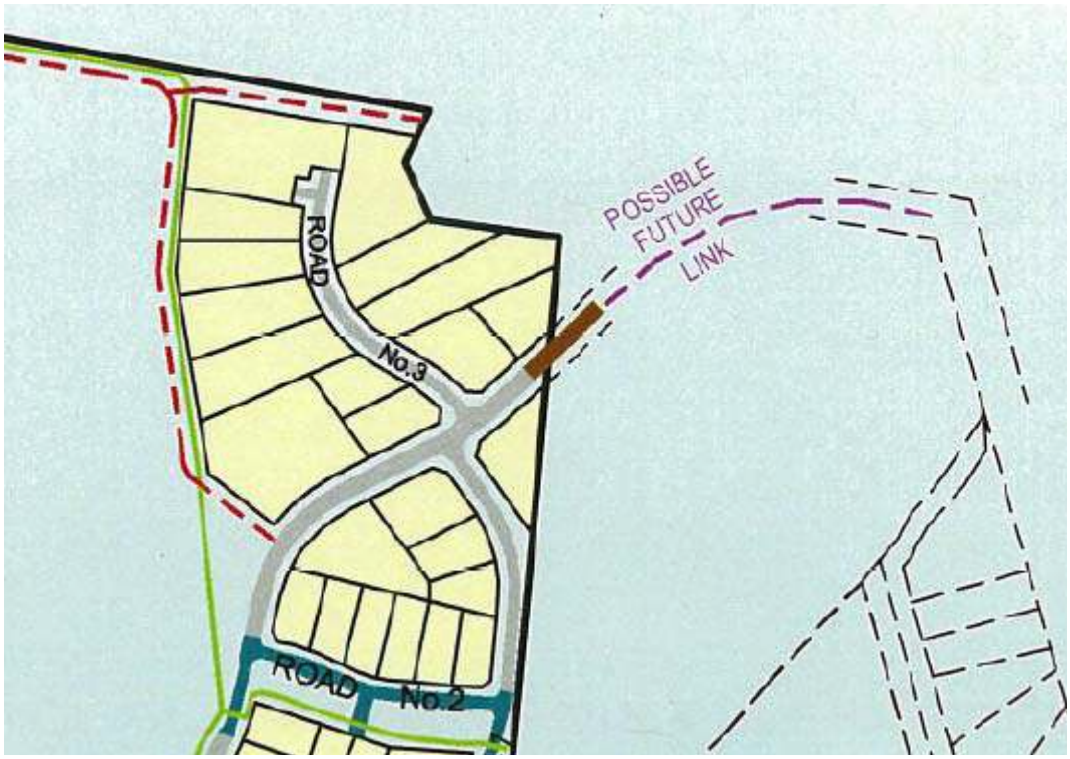

Figure 58 - Proposed future linkage to the north east/east (Source: CPG Australia 2009)

Infrastructure

The existing utility infrastructure within the Lakes Estate will be extended to service the proposed subdivision. The provision of utility and reticulated services has been provided based on the natural topography of the site, to ensure an efficient and sustainable provision of services to the proposed subdivision and the surrounding area. The assessment of the proposed servicing strategy for the subdivision has determined two 'catchments' within the subdivision to facilitate efficient provision of reticulated services (see **Appendix GG** and **Section 6.9**). Catchment 1 is divided into two sub-catchments and includes the majority of land within the eastern portion of the subject land.

Catchment 1A includes land east of Lakes Drive and Myall Close, as well as existing stages of the Lakes Estate, and stage 3 of the proposed subdivision. Catchment 1B includes land west of Lakes Estates and Myall Close to the ridgeline defined as the boundary of Stage 1 of the proposed subdivision (see **Figure 72** and Sheet 4 of **Appendix GG**). Several lots within stage 1 are excluded from this catchment due to their predominant slope to west

Catchment 2 includes the remaining portion of the subject land being proposed lots 87 – 109 within the far western extent of Stage 2, proposed Lots 1 – 4 and 27 -37 within Stage 1 and the adjoining Highlands Estate to the south east (see Figure 73 and Sheet 5 of **Appendix GG)**.

Reticulated sewer is proposed to service the entire subdivision. The eastern portion of the subdivision will be serviced by an extension of the sewer mains from its current layout within the existing stages of the Lakes Estate and the adjoining residential development to the east. In terms of the proposed servicing layout, proposed lots 1 – 4 and 27 – 37 within stage 1 of the proposed subdivision have been determined to be within 'Catchment 2' of the subdivision given the natural topography. As such, a 150mm sewer main is provided along the common boundary of the Highlands Estate (Lot 2 DP82747) which will link with the proposed sewer infrastructure of the adjoining land and allow proposed Lots 1 - 4 and 27 - 37 to be gravity fed to pump station 50A ("PS50A") which is proposed within the adjoining Highlands Estate to the west (see **Figure 59** below).

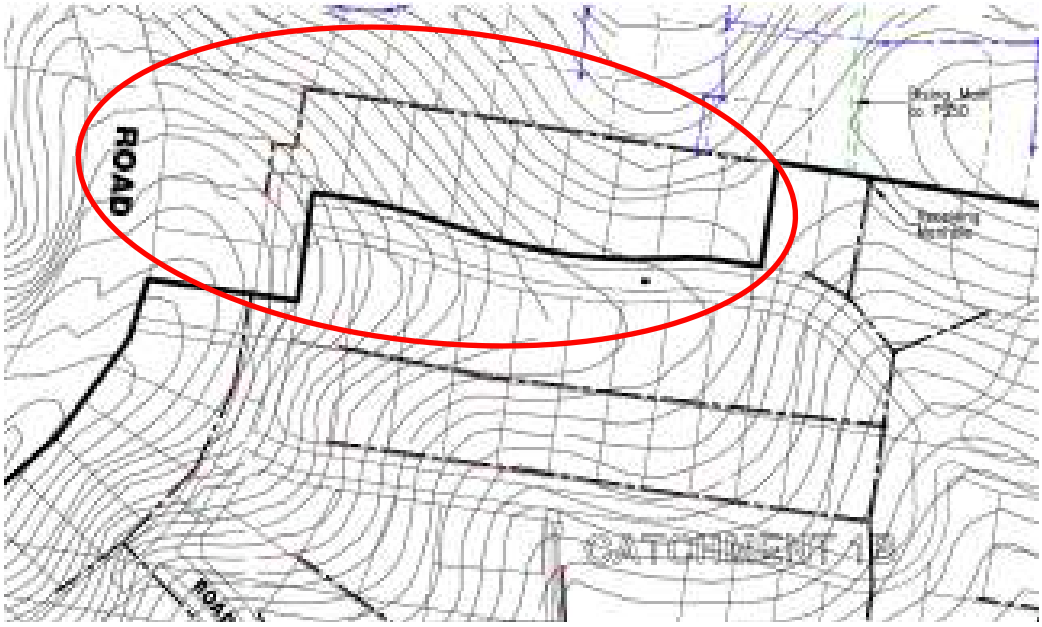

Figure 59 - Area of proposed subdivision to be connected to sewer infrastructure of adjoining land – refer to Appendix GG (Source: RDM 2008)

The western portion of the subdivision cannot be serviced within the existing Lakes Estate catchment (catchment 1) due to the topography of the site, and is proposed to be serviced within catchment 2. PS50A is located within the adjoining Highlands Estate (Lot 2 DP82747), and as such, the western portion of the land is proposed to be linked with the proposed reticulated sewerage infrastructure of the adjoining land.

Water supply services will be connected in the north from an existing 600mm water main, with further connections to an existing water main to the east (Lophostemon Drive), with gravity feed system provided throughout the subdivision (refer to **Section 6.9.1**). An extension of the 600mm water main in the north is proposed to service the western portion of the subject land, and will also extend into the adjoining Highlands Estate further south.

Electricity is provided to the site via 66kV overhead lines. Country Energy has confirmed that this supply will be adequate to cater for the proposed development. The 66kV line currently traverses the proposed subdivision and is required to be relocated. A temporary connection has been provided within the subject land to connect these existing services while the estate is developed. This existing arrangement will be re-routed to an underground service between the existing permanent service on the western boundary of the subject land and the eastern extent at Lophostemon Drive. Two options are proposed for the re-alignment and provided for agency determination.

1. Routing the alignment along the shortest route within the proposed road reserve system.
2. Routing the alignment along the shortest route within the proposed road reserve system and also using the reserve areas (Flora and Fauna linkages)

The existing connection points at the western (Highlands Estate) and eastern (Lophostemon Drive) extents of the subject land will be retained by the development.

6.7.2 Consistency of the proposal with surrounding character

The development is proposed within a planned release area of Coffs Harbour. The North Boambee Valley area provides undulating topography and offers significant potential for residential development. An information sheet has been prepared as a 'conceptual' master plan for the site, which encourages subdivision which responds to the natural topography of the subject land. The proposed subdivision reflects the existing character and style of the Lakes Estate and provides a logical expansion of the estate. The main collector road through the subject land is extended to service the northern portion of the subject land, with smaller local roads provided to create 'neighbourhoods', separated by natural vegetation. The design avoids cul-de-sacs where possible and increases the connectivity and flow within the subdivision.

The proposed lots generally reflect the higher density residential land surrounding the site, however lot sizes have been increased in stepper areas to provide increased dwelling opportunity, and also where the subdivision adjoins the future alignment of the Pacific Highway by-pass to allow increased provision of vegetation buffers. Consideration has also been made of solar efficiency of the subdivision, with the natural topography allowing east-west orientated lots on the southern portion of the land to maintain adequate northern solar access. Lots proposed within the northern portion of the site are predominantly orientated in a north-south layout, or allow building envelopes to be provided with maximum northern orientation. Surface run-off is retained in the central lakes of the subdivision which provides a natural water feature. Roads and drainage facilities are designed to encourage run-off to this location. All future dwellings will be encouraged to incorporate water efficiency techniques such as water tanks for re-use.

The layout of the subdivision also incorporates natural vegetation within its design, which provides for natural open space areas, as well as contributing to the aesthetics of the subdivision. Future dwellings on the land will be subject to design guidelines, as is applicable for the existing subdivision in the previous stages of the estate. These guidelines relate to roof pitch and design, building finishes and materials, fencing and driveways.

6.7.3 Consistency with relevant design guidelines

The subdivision design has had regard to the provisions of the *Coastal Design Guidelines for NSW*, the *NSW Coastal Policy 1997* and *SEPP 71 – Coastal Protection*.

Coastal Design Guidelines

The NSW Coastal Design Guidelines ("the CDG's") are guidelines aimed at providing design guidelines encourage a high standard of urban form in development along the New South Wales Coast with regard to greater demand and growth for residential development within coastal areas. The CDG's also promote Ecological Sustainable Development ("ESD") Principles for coastal development and are based on the NSW Coastal Policy 1997.

Coffs Harbour is identified as a Coastal City in the context of the CDG's given it maintains a population in excess of 20,000. Coastal Cities are defined within the guidelines as having urban characteristics of:

- a street pattern related to the landform and the surrounding natural features;
- a direct relationship to the foreshore and a wide choice of uses associated with the coastal edge;
- an extensive range of edge conditions, such as parks, beaches and waterfront promenades;
- a range of smaller suburbs and suburban centres surrounding the city centre;
- a full range of residential building types; and
- a full range of building heights from low scale to tall.

The intent of the CDG's with regard to coastal cities is to '*balance the requirement to achieve growth with the need to retain the existing character*'. In this instance, the proposed subdivision occurs within the urban fringe of the existing Coffs Harbour urban area. The subject land contains large areas of native vegetation and EEC's as well as watercourses and steep slopes. The subdivision response therefore seeks to maximise residential opportunities within this location, while promoting the features of the site which contribute to the character of the location.

Design Guidelines

Part two of the CDG's specify design guidelines for development within coastal areas and aims to implement the desired future character of the settlements and cities through provision of design guidelines which reinforce these aims.

To determine the character of the area, the CDG's utilise tools which allow a development to determine the 'settlement structure'. The settlement structure utilises the urban and natural features to provide a snapshot of the character of the location which can be used to guide the development and design process. Five principles are utilised in assessing the settlement structure, and the proposed development is assessed against these elements.

1. Defining the Footprint and Boundary

The 'defining the footprint and boundary' is the first principle under the CDG's for defining the settlement structure. The objectives for defining the footprint and boundary of settlements are to:

- determine the location and type of edge as part of an overall structure plan based on existing context and the location and setting of adjoining settlements;
- maintain coastal ecosystems and greenbelts;
- provide separation between settlements via greenbelts or rural lands;
- protect local character;
- protect visual settings;
- maximise the use of existing services and infrastructure; and
- revitalize existing urban centres by concentrating new development to support them.

Coffs Harbour is a 'coastal city' and is forecast to be subject to considerable residential growth. This is evident through the preparation of the OLC Strategy and the provision of a number of growth areas within the Coffs Harbour LGA. The subject land is contained with the North Boambee Valley Growth area which is located to the south west of the Coffs Harbour CBD. While effectively existing as an edge, the subject land has been

identified for residential growth and is anticipated to be part of a fully developed residential area within the next ten years. As such, it is considered growth of the Coffs Harbour urban area is likely to extend west of the existing urban area.

The location is considered suitable for residential growth given its location of the urban fringe of Coffs Harbour. The location is considered an appropriate location for future growth and has been identified as a short term growth area for the LGA. This EA and the supporting assessment identifies the ability of the subject land to sustain proposed growth and retain the natural and urban structure of Coffs Harbour.

To meet the objectives, the CDG's identify four ways in which coastal development may be accommodated; no or limited development, maintaining a compact settlement footprint, expanding the boundary of a settlement or creating a new settlement. In this instance, it is considered the development falls under the provisions of 'expanding the boundary of a settlement' and 'creating a new settlement'. The development effectively increases the boundary of the Coffs Harbour urban area, however forms part of the North Boambee Valley area of which is proposed to accommodate future social and physical infrastructure to accommodate increased residential growth. At full development, the North Boambee Valley will represent a new settlement within the Coffs Harbour urban area of which the proposed subdivision will be included.

The design guidelines for creating a new settlement are considered the most appropriate to be considered in context of the proposed development. The guidelines are identified as:

(a) enhance natural and heritage features and views
(b) retain existing vegetation and ecology
(c) reinforce and continue existing open-space networks and greenbelts, through and between settlements
(d) reinforce and continue the urban structure of the existing settlement and its centre or main street
(e) utilise existing services, infrastructure and co-locate facilities
(f) optimise under-utilised infrastructure, such as public transport, shops and community facilities, and retail and commercial areas
(g) provide a permeable block and lot pattern in sympathy with the topography and land uses
(h) relate higher density housing to the pattern of built form within the existing settlement
(i) design blocks, lots and buildings together to ensure the efficient use of land
(j) provide or retrofit to achieve water-sensitive urban design initiatives locally and on sites
(k) achieve walking and cycling distance to places of importance within the settlement or provide new local centres within the catchment of residential areas.

The proposed subdivision has had consideration to the natural and urban features of the subject land and surrounding area. The design promotes the unique natural setting and enhances the natural and heritage elements of the site including prominent views and vistas. The vegetation and natural habitat of the site is retained through provision of conservation areas and habitat corridors, which ensure linkages and continued high quality habitat provision within the surrounding area.

The subdivision includes provision of open space and connectivity with existing open space areas. The intent of the subdivision design is also to allow future connectivity and pedestrian and cycle movement. The design also reinforces the urban structure of the

location and continues the design of the developed stages of the Lakes Estate and the adjoining subdivisions, particularly Lakes Drive which exists as a main arterial road. Future development within the location will include community infrastructure and provide 'town centre' development to service the North Boambee growth area.

Existing physical and social infrastructure will be utilised by the subdivision and enhanced to create more efficient use of such services. Physical infrastructure such as sewer, drainage and electricity will be extended to service the new allotments and will be provided with regard to energy efficiency and sustainability. The development also increases the provision of public transport services and provides access to public transport infrastructure from all proposed allotments.

The layout of the subdivision has been determined with regard to the topographical layout of the site and surrounds as well as allowing all future developments to achieve appropriate solar and water efficiency and provide appropriate living areas and surrounds. The layout of the subdivision has also had regard to protection and retention of natural landscape features.

2. Connecting Open Spaces

The objectives of the Connecting open spaces principle are:

Regional and local open-space networks are to provide areas for water management, for incorporating a logical pedestrian and cycle system, and to ensure connected, well located and designed places for active and passive recreation for residents and visitors within and between settlements.

Regionally the open-space network also:

- creates separation between settlements
- protects the natural visual setting of settlements
- contributes to regional ecological systems.

Locally the open-space network:

- creates identity and character for settlements
- provides amenity for residents and visitors
- enhances, improves and provides open spaces for a range of passive and active recreational opportunities
- ensures adequate setbacks to protect natural areas
- contributes to improved water quality
- protects conservation areas and connection to corridors, transition areas and setbacks, which links and protects ecosystems
- provides safe and convenient pedestrian and cycle access through and around the settlement to the coast and to other places of cultural, commercial, scenic and natural value
- implements and improves water-sensitive urban design, total water cycle management and storm water quality
- protects Aboriginal and European cultural places, relics and items
- provides a landscape setting and outlook for settlements and protects the key natural features surrounding settlements.

The specific guidelines for connecting open spaces are addressed below.

Table 19 - Compliance with 'connecting open space' principle under NSW Coastal Design Guidelines

GUIDELINE	RESPONSE
1. Locate and connect new and existing open spaces which protect and maintain: a. nature reserves, conservation areas, park lands and environmental protection areas b. the natural and rural setting of the settlement including the scenic values of the visual catchment c. remnant native vegetation.	The main open space areas within the subdivision incorporate the existing remnant native vegetation and conservation areas. This design allows the remnant vegetation including habitat and EEC's to be enhanced and protected under the development. It also ensures the character of the location is retained and maximised within the growth corridors of the city.
2. Establish continuous ecological corridors to incorporate existing remnant vegetation by connecting reserves and conservation areas from the hinterland or surrounding mountains to the coastal edge.	The subdivision retains corridors which link with adjoining areas of vegetation. The design allows continuous linkages between high habitat value areas and ensures the residential development of the site does not compromise the effectiveness of the remnant vegetation and habitat.
3. Provide setbacks to protect property from the effects of coastal erosion, flooding and bushfire.	The subdivision has been designed with appropriate setbacks with regard to bushfire and flooding. The inland location of the subject land means that coastal erosion of the site is highly unlikely.
4. Locate open-spaces to build on the special attributes of an area for long-term public amenity and identity of the place. An open-space network may include hill tops, river frontage, mature trees, places with panoramic views, rocky outcrops and remnant vegetation.	The site presents with a large vegetated area and slope to the north. This location represents a prominent natural feature of the site, and as such the subdivision utilises this area within its design to provide open space as well as preserve a prominent natural feature. The natural slope of the site is also utilised to provide views and vistas from pedestrian and cycle paths as well as open space areas.
5. Where feasible preserve settings for places of cultural heritage within the open-space network.	The conservation area has been identified as having various European and Aboriginal cultural significance. The retention of this area allows preservation and interpretation of these elements which promote the heritage of the location.
6. Provide areas within the open-space network sufficient to detain and cleanse stormwater runoff and avoid impacting sensitive ecologies.	The existing development of the Lakes Estate includes existing ponds and wetlands which have been included within the open space network. This network provides amenity to dwellings and the open space and connectivity network as well as providing a detention system for stormwater drainage.
7. Establish edge open-spaces with streets and pedestrian pathways. These are best located within the development	The subdivision includes parks and pedestrian walkways within its design. It also utilises existing central open space within the developed stages of the Lakes Estate.

	footprint of the settlement, rather than in an open-space zone.	
8.	Provide pedestrian and cycle access that: a. does not compromise the ecological values of high conservation areas b. connects important places throughout the settlement c. connects residential areas to commercial and retail locations without compromising the visual, aesthetic or ecological values of the foreshore.	The subdivision includes a pedestrian and cycle path that takes advantage of the prominent natural elements of the site and connects all allotments within the subdivision to open space areas, public transport locations and surrounding neighbourhoods.
9.	Provide a variety of large and smaller open spaces to serve a range of different active and passive recreational roles, for example: a. playing fields b. playgrounds and small pocket parks c. walking and cycling connections d. places and activities for people with physical disabilities.	The subdivision includes different open space areas. The large conservation area offers a natural landscape location which provides an attractive setting. Other small parks within the estate allows both passive and active activities as well as providing interpretation of Aboriginal heritage.
10.	Co-locate recreational facilities with shops, schools and other community facilities to reduce parking and minimise walking distances.	The master plan for the North Boambee Valley includes future community and social infrastructure in later stages. The proposed development seeks to maximise connectivity with future stages of North Boambee Valley.
11.	Landscape design of open spaces should reflect the different qualities of the location and their functions.	The landscaping of the subdivision and in particular streets and parks, has been designed to reflect to reflect the coastal environment and the existing residential areas surrounding the subject land.

3. Protecting the Natural Edges

The objectives of the protecting natural edges principle are:

To achieve this vision for settlement edges new strategies for developments need to:

- provide improved access to the NSW coast
- retain the foreshore and headlands in public ownership for public uses
- protect buildings and properties from storm events and sea level rise
- enhance the character and function of spaces along the foreshore and headlands
- enhance the beauty, ecological values and visual amenity of the NSW coast
- maintain a range of passive and active recreation areas along the coast
- manage bushfire risk.

For natural edges new strategies for development need to:

- maintain access to public land
- provide areas for managing bush fire asset protection
- reduce the encroachment of invasive plant species into natural areas • protect sensitive ecological areas.

The specific guidelines of the protecting natural edges principle are addressed below.

Table 20 - Compliance with 'protecting natural edges' principle under NSW Coastal Design Guidelines

GUIDELINE	RESPONSE
1. Define the key characteristics and functions of public spaces along the foreshore with particular regard for sites of significant social and cultural importance.	The site is not located along the immediate coastal boundary.
2. Maintain foreshore areas and setbacks in public ownership.	The development has no impact upon coastal foreshore areas including access or ownership.
3. Ensure that existing and remnant native vegetation is protected through generous setbacks and defined points of access.	The existing vegetation is proposed to be protected through provision of a conservation area within the subject land. This conservation area is well buffered to the future residential allotments and has defined access points.
4. Provide pedestrian access to and along the foreshore with provision for those with less mobility.	The site is not located along the immediate coastal boundary. The development will therefore not restrict access to the foreshore.
5. Avoid the remodelling of foreshore areas to ameliorate coastal processes by buildings or other structures.	The site is not located along the immediate coastal boundary.
6. In new areas provide edge roads (or unformed pedestrian pathways) between all urban areas, foreshore reserves and orient streets to provide: a. direct pedestrian access to the foreshore b. views to the foreshore as well as distant views and vistas.	The vegetated areas of the site are proposed to be buffered by paths and roads to increase the separation and potential conflicts between the natural areas and the residential development.
7. Define clear pedestrian and vehicular entry points and access routes through the foreshore reserve to reduce the impact of traffic through dunes, coastal vegetation and other fragile areas.	The site is not located along the immediate coastal boundary.
8. Design and locate foreshore facilities, such as car parks, toilet blocks and picnic areas, to reduce their visual intrusion on the foreshore, view corridors and vistas.	The site is not located along the immediate coastal boundary.
9. Encourage public rather than private jetties and boat facilities.	Not applicable

10. Ensure the ecological integrity of vegetation on the foreshores and headlands is not compromised by creating views and outlook from private properties and by encouraging filtered views.	The site is not located along the immediate coastal boundary.
SETBACKS	
11. Areas adjoining freshwater estuarine, coastal habitats and the coastal edge are managed to reduce land use impacts through setbacks that also supports the protection of properties from erosion, protection of sensitive ecologies, provision of public access along the foreshores and to natural areas, provision of visual amenity along the foreshore, protection of properties from the effects of sea-level rise, improvement of water quality.	The vegetated areas of the site are proposed to be buffered from the residential development to increase preservation and protection of the prominent habitats as well as to reduce conflicts between natural areas and residential development.
12. Setbacks should also address coastal erosion hazards such as storm surge events and river flooding, long-term shoreline recession and sea-level rise, cliff retreat and catastrophic collapse, sand drift hazard, entrance stability, estuarine erosion and changes in tidal current position.	The subdivision has also had regard to future impacts associated with natural hazards and events such sea level increase, coastal erosion, flood increases. The inland location of the site reduces the potential for severe impacts.
13. Setbacks are designed to protect ecosystems and reserves covered under SEPP 14 wetlands, SEPP 26 littoral rainforest, SEPP 53 koala habitat as well as salt-marsh and mangrove communities, riparian vegetation, frontal dunes and headlands, national parks, protected areas and reserves.	The vegetated areas of the site are proposed to be buffered from the residential development to increase preservation and protection of the prominent habitats as well as to reduce conflicts between natural areas, habitats and residential development.
14. For new developments the foreshore setbacks should be at least 50m wide as a precautionary measure where possible.	The site is not located along the immediate coastal boundary.
15. Setbacks may need to be marked and their vegetation preserved. Setbacks should where possible be increased to 100m or more where they are adjacent to ecologically sensitive areas or in situations where the coastal erosion hazard requires greater distance.	The setbacks between the vegetated areas are less than 100 metres, but are considered suitable based on specialist assessment of the vegetation and habitat. The design of the subdivision is such that activity and interface is minimised through provision of slow points within the road network and koala friendly fencing.
16. Setbacks for redevelopment should consider a 100 year planning timeframe to address shore line retreat and sea-	The inland location of the site ensures that potential shoreline retreat and sea level rise are unlikely to

	level rise.	detrimentally impact the development. The impact of climate change is addressed within section
17.	Coastal estuary planning for local areas must detail the issues place-specifically and follow guidelines in the Coastal Zone Management Manual.	The site is not located along the immediate coastal boundary.
18.	Development on frontal dunes is avoided.	The site is not located along the immediate coastal boundary.
19.	Set new development back from the foreshore edges of the ocean, lakes and other waterways to protect visual amenity and create opportunities for public access.	The subdivision design provides adequate setbacks to prominent waterways within the site.
20.	The design of buildings and other structures on properties adjoining the foreshore complements the function and character of the foreshore.	Not applicable.
21.	Setbacks in public ownership where ever possible, allow opportunities for public access and have limited development including no roads, private allotments, infrastructure and retaining walls in these locations.	Not applicable.

4. Reinforcing the street pattern

The objectives of the reinforcing the street pattern principle are:

Maintain and continue the original street pattern and plan new streets and blocks to ensure that:

- the street pattern responds to the topography
- the street pattern provides views or vistas of important natural features within the surrounding landscape
- streets are aligned with and connect to places of civic and community importance
- important vistas and skylines are framed throughout the settlement
- a street hierarchy appropriate to the social, retail and residential requirements of the settlement
- high quality landscaping is included
- way-finding and legibility is promoted
- commercial activity is facilitated
- integrates land use and transport functions.

The specific guidelines of the reinforcing the street pattern principle are addressed as follows.

Table 21 - Compliance with 'reinforcing the street pattern' principle under NSW Coastal Design Guidelines

GUIDELINE	RESPONSE
Reinforcing the street pattern can be achieved by:	
1. Building on the original and established street and block patterns in terms of the pattern of circulation, access to lots and uses.	The subdivision reflects the street layout design of the surrounding area. In particular, the development links with the existing road pattern of the developed stages of the Lakes Estate.
2. Ensure the settlement is easily navigable and logical in terms of access and location of uses.	The subdivision provides a road layout which avoids cul-de-sacs and provides high accessibility and movement between all lots and the main arterial roads of the subdivision and the surrounding area. The design avoids dead-ends and is easily navigable by residents and logical.
3. Optimise the number of connections within the street. The traditional grid provides high accessibility and permeability for pedestrians and vehicles.	The importance of permeability is recognised for both ease of movement through the subdivision, but also for logical and effective movement within the subdivision. The design builds on the existing subdivision layout of the early stages of the Lakes Estate and provides a relatively high degree of permeability. The road network weaves through the subdivision and provides for continuous movement by reducing cul-de-sacs and end points.
4. Recognise or design streets in response to the topography and other natural features by ensuring a predominance of streets that relate to the original landform.	The subdivision is designed with roads generally extending north south in response to the topography and vegetation of the site.
5. Protect streets that provide access and views to the coast, foreshores and headlands, other significant natural features and places of public importance.	The subject land does not maintain any direct foreshore views, however views and vistas within the site have been identified and the resultant design maximises these views.
6. Allow for changes on private land whilst valuing the qualities of individual streets including: a. their order within the hierarchy b. access and street address c. carriageway, footpath and reserve alignments, building setbacks d. street trees which will offer filtered views of the coast e. vistas and view corridors.	The subdivision has been designed with attractive landscape streets which reflect the surrounding design and character of the locality. All roads within the subdivision are designed with regard to their proposed function and location and allow for future changes within private land without detrimentally affecting the character of the streets or the locality.
7. Minimise road crossings over waterways and water bodies.	The subdivision design does not include any waterway crossings. All drainage is directed under the roadways where necessary via culverts.

GUIDELINE	RESPONSE
8. Encourage grass swales and pervious surfaces to increase stormwater infiltration.	The subdivision includes locations of grassed swale drains in higher slopes and between ponds and wetlands. The drainage system also includes an artificial vegetated wetland.
The street hierarchy can be strengthened by:	
9. Protecting the rural and natural character of the main access roads by restricting development fronting onto them.	The subdivision has been designed to reflect the surrounding area in terms of streetscape appearance and function. The design incorporates weaving streets and landscaping which incorporates with the natural surrounds and features of the site.
10. Reinforcing main streets as the commercial and social heart of the settlement.	Not applicable.
11. Developing public edge roads around the settlement to provide separation between urban areas and sensitive ecologies and open-space areas. This provides asset protection zones for bushfire management and access to open spaces, foreshores and headlands.	The subdivision maintains interfaces with sensitive ecological areas in the northern portion of the site. The design provides roads along this interface which allows increased buffer distances between residential development and sensitive environmental areas. The vegetated areas of the site to the north also offer koala habitats. Narrow weaving edge roads are designed along the interface of these locations to reduce traffic speed and provide increased safety within the koala habitat.
12. Limiting fast moving through traffic in residential streets.	All roads within the subdivision are designed as weaving or curved roadways to reduce traffic speeds to 50 km/h or less. In sensitive locations of the site including within vegetated areas or along interfaces with high value koala habitat, the road is designed to restrict vehicle speed well below 50 km/h.
13. Protecting laneways in residential and commercial areas from being built into or over.	Not applicable.
14. Establishing a system of pedestrian pathways throughout the settlement and between settlements.	A pedestrian and cycle path network has been established within the subdivision. The design focuses on providing access from all allotments to internal open spaces, as well as providing linkages to future development within the North Boambee Valley.
15. Reinforcing streets with appropriate street vegetation planting.	All streets within the subdivision are proposed to include street tree planting and landscaping. The main arterial road through the estate, Lakes Drive, will provided with greater landscaping to reinforce its role as the main road within the subdivision.

5. Appropriate buildings for a coastal context

The objectives of the appropriate buildings for a coastal context are identified as:

> The objectives for built form need to relate to different coastal settings. However, there are some objectives which are common to all new developments and they are to:
>
> - ensure amenity is maintained on public land and on site
> - be appropriate to its location within the settlement and the settlement type
> - be appropriate to its natural setting
> - add economic, cultural and visual value to its location
> - be of high quality design
> - recognise the importance of materials suitable to the coastal setting
> - provide well designed, appropriately located and sized private open spaces which serve to minimise urban run off
> - provide a visual focus only where identified for a public building
> - maintain a high quality publicly accessible interface with the foreshore.

The proposal does not include any residential development. Despite this, the development has been designed with regard to providing a high standard of future residential development.

NSW Coastal Policy 1997

The NSW Coastal Policy 1997 ("the NSWCP") provides a framework for coastal zone management, planning and conservation within NSW coastal regions. The purpose of the NSWCP is to provide for future management of the NSW coastal zone and provide strategic actions for future development and growth of the coastal zone. The NSWCP builds on previous strategic work and the updated policy includes ESD principles.

Part B of the NSWCP provides a list of nine 'goals' which are developed in response to the identified issues within part A of the NSWCP. Within each goal, a set of strategic actions are identified for achieving the goal. Goal 6 of the NSWCP is stated as 'to provide for ecologically sustainable human settlement'. This is relevant to the proposed subdivision and the strategic actions for human settlement are discussed below.

Table 22 - Compliance with strategic actions of NSW Coastal Policy 1997

OBJECTIVE		RESPONSE
6.1	To ensure that future expansion or redevelopment of urban and residential areas, including the provision of infrastructure, avoids or minimises impacts on environmentally sensitive areas and cultural heritage.	The subdivision design is in response to the environmental constraints on the site, particularly remnant vegetation, high value habitat, watercourses and slope. The design seeks to retain and protect the natural environment of the site and incorporate into the overall design with minimal impact upon its function and sustainability The subdivision has had due regard for the Aboriginal and European cultural heritage of the site A comprehensive assessment of both have been undertaken and the recommendations for preservation and reduced impact have been incorporated into the overall design
6.1.1	Coastal urban planning/settlement strategies prepared by DUAP will ensure recognition of environmentally sensitive areas or natural and cultural heritage resources when identifying suitable areas for urban growth.	The development has had regard to all settlement strategies prepared and adopted at the time of this report.
6.1.2	Local councils will prepare urban land release/settlement strategies prior to major rezoning of rural land for urban expansion or will ensure that any such rezoning are consistent with endorsed regional settlement strategies.	The subject land is contained within the North Boambee Valley urban release area which has been prepared by Coffs Harbour City Council. The release of this land has been contained within the OLC Strategy prepared by Council.
6.1.3	Population projections, including an analysis of trends for coastal regions for the period 1996 to 2021, will be regularly updated and published to provide an assessment of growth and demand for urban development.	The MNCRS prepared by Council, and the OLC Strategy prepared by DoP provide updated population projections for the Coffs Harbour LGA. These projections indicate continued growth of the region and provide further justification for the proposed development. These projections are discussed in greater detail earlier within this report.
6.1.4	Canal estate developments will not be permitted and a State Environmental Planning Policy made to implement the policy.	Not applicable.
6.2	To promote compact and contained planned urban development in order to avoid ribbon development, unrelated cluster development and continuous urban areas on the coast.	The development is proposed on the fringe of the Coffs Harbour urban area and represents a high standard of urban development. The development represents a logical and preferred growth pattern for the city.

OBJECTIVE		RESPONSE
6.2.1	Planning instruments and development control plans will define the boundaries of urban areas and indicate the amount and form of development which is appropriate for each location taking into account the environmental and servicing implications.	Council's OLC Strategy identifies the land as a within the North Boambee Valley release area. The NBVDCP has been released for referral and once gazetted will guide development of the area through its development. It is also understood Council are preparing a new LEP in accordance with the NSW Planning Reform program.
6.2.2	The design of towns and buildings should have regard to energy efficient principles, for example compact town form related to transport networks, in order to reduce energy dependency.	The subdivision has been designed to provide all lots with maximum opportunity for future dwellings to achieve high energy efficiency. The design of infrastructure within the subdivision has also had regard to energy efficiency.
6.3	To ensure rural residential developments are located in areas where impacts on the natural environment or valuable agricultural resources are minimised.	Not applicable.
6.3.1	Local councils will prepare rural residential release strategies prior to any major rural residential rezoning in order to preserve land with scenic and conservation values, prime agricultural land and land identified as having significant mineral or extractive resources. Regard should be given to the Department of Urban Affairs and Planning's Rural Settlement Guidelines and Rural Land Evaluation Manual in preparing these strategies.	Not applicable.
6.4	To provide for choice in both housing and lifestyles.	The development has been designed with a range of lots sizes, dimensions and orientations with an emphasis on variety. The range of lot sizes will encourage a diversity and high standard of dwelling choice, including medium density housing and affordable housing.
6.4.1	A greater choice in housing will be encouraged in coastal urban areas through local and regional housing strategies.	The OLC Strategy and MNCRS have been discussed in context to the proposed subdivision and particularly with regard to settlement and housing.

OBJECTIVE		RESPONSE
6.4.2	Higher density residential development, in close proximity to coastal town centres, should encouraged through the use of planning instruments and development control plans, to provide easy access to services and employment and create a sustained and stimulating town centre environment without strain on existing infrastructure.	The development is in accordance with density requirements under the LEP and DCP's, and the density of the subdivision is considered to reflect that of the surrounding location and provide a consistent design.

SEPP 71 – Coastal Protection

The relevant standards of SEPP 71 have been discussed earlier in this report within Section 4.2.6. The development is considered to be consistent with the design standards of SEPP 71.

6.7.4 Subdivision type

The subdivision is proposed entirely as a Torrens Title subdivision. The existing area of the Lakes Estate and the surrounding residential areas are consistent with Torrens Title subdivisions.

6.7.5 Staging

The subdivision is proposed to be released in three stages (see **Figure 5**, **Figure 6** & **Figure 7**). The release of each stage will be subject to demand for housing and subsequent sales of the preceding stages. A staging plan has been prepared and is attached to this EA at appendices E – F.

STAGE	RESIDENTIAL LOTS	RESIDUAL LOTS
1	74	0
2	78	1
3	44	1
Total	196	2

6.7.6 Potential urban design guidelines

The objective of the subdivision is to provide a well designed urban environment, and as such design controls will be implemented to reinforce these objectives. The existing Lakes Estate includes development guidelines in relation to design quality and built form of residential development. The proposed subdivision will include built form controls, building envelopes and restrictions articulated through the use of covenants, as well as through preparation of built form and design controls similar to those in effect within the earlier stages of the Lakes Estate.

Building envelopes have been specified for each allotment to provide a preferred urban layout within the subdivision, which has regard to existing zonings and constraints (see **Figure 58 – 60** below).

Figure 60 - Proposed building envelopes – Stage 1 (Source: Astoria Pty Ltd 2009).

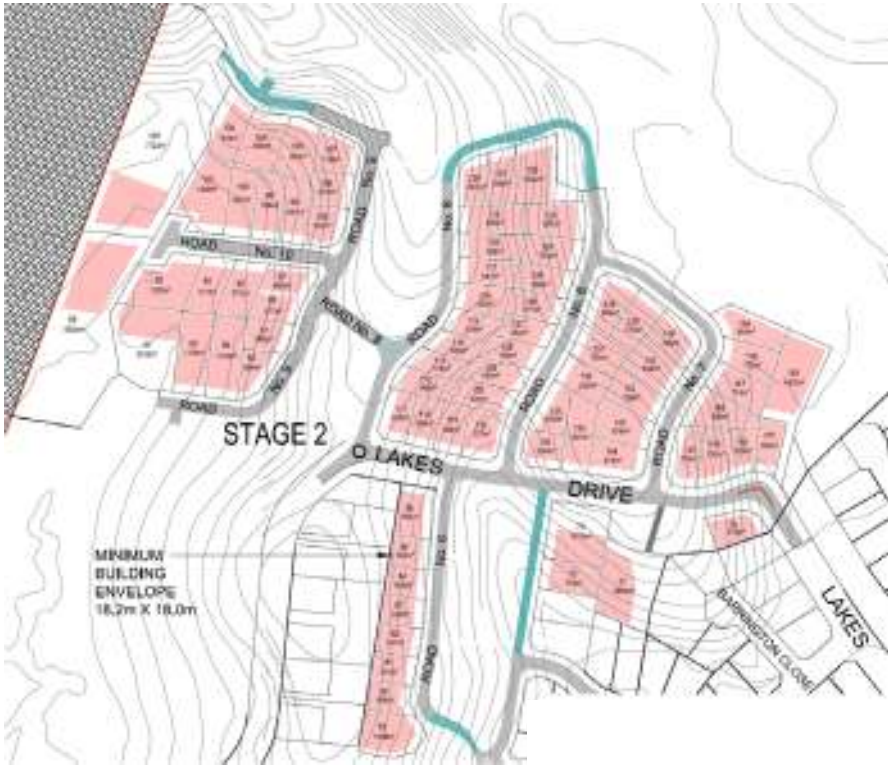

Figure 61 - Proposed building envelopes – Stage 2 (Source: Astoria Pty Ltd 2009).

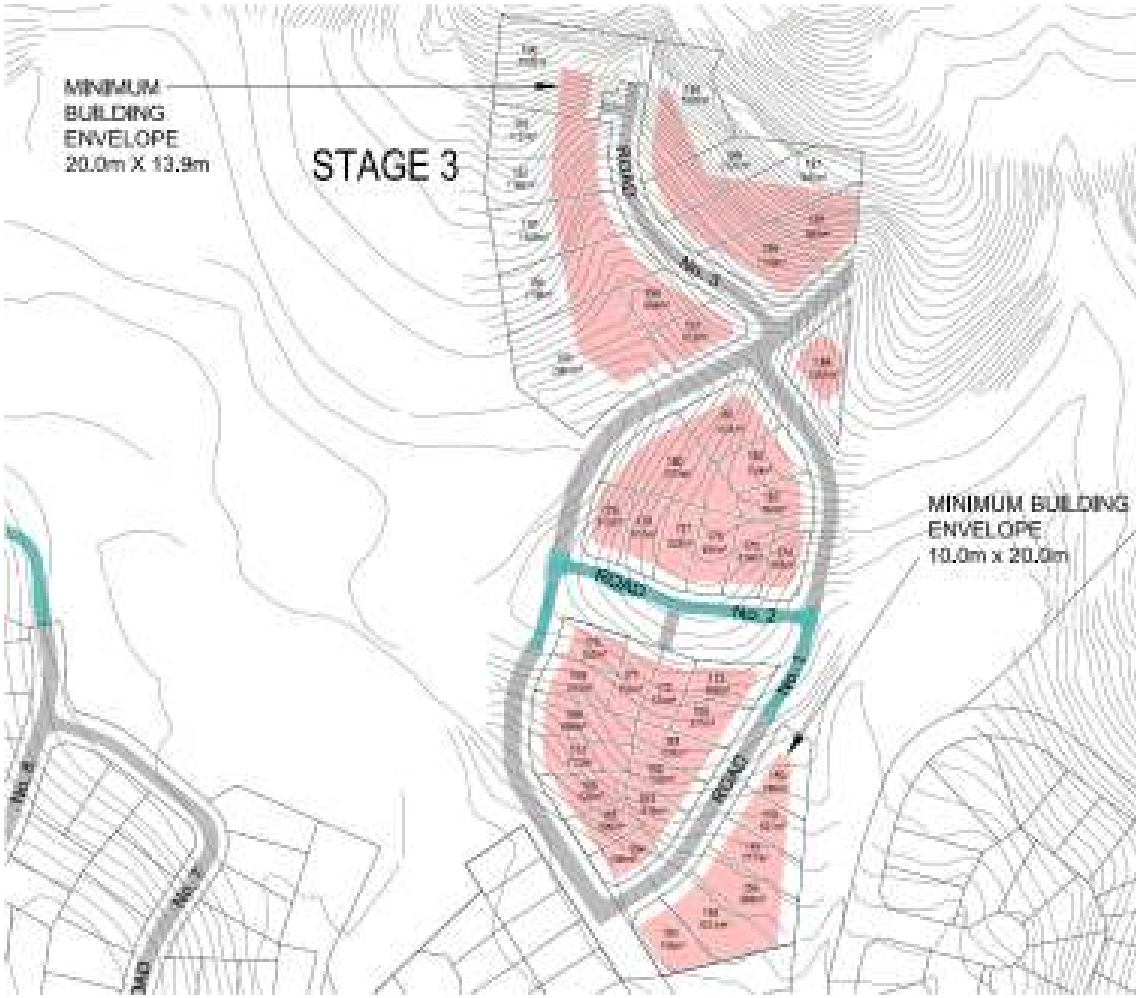

Figure 62 - Proposed building envelopes – Stage 3 (Source: Astoria Pty Ltd 2009).

Figure 63 - Existing residential development with the Lakes Estate. Note the low pitch of rooves and use mixed driveway materials.

6.7.7 Management, maintenance and funding of open space and conservation areas

The open space and conservation areas contained within the larger residual allotment of the subdivision will remain in ownership of the developer and all maintenance and management will be funded by the developer. This will allow the area to be maintained and conserved in accordance with the recommendations of the specialist reports attached to this EA. The land may be transferred to Council ownership in the future, however is not proposed at this stage. Overall, little modification will be made to the conservation areas given the high habitat and EEC value. Some Koala management controls are proposed along the edge of the conservation areas to restrict domestic animals entering the conservation area, and also to restrict Koala's entering the residential areas.

6.7.8 Buffers to adjoining banana lands

The subdivision contains areas previously utilised for banana plantations. The North Boambee Valley also contains areas of existing banana plantations. From a review of the site and aerial photography, the subject land is adjoined by banana plantations to the north.

The North Boambee Valley Information Sheet identifies required setbacks for residential development from the existing banana lands. The Information Sheet identifies a required setback of 150 metres with a biological buffer of at least 30 metres to be provided within this buffer. The purpose of the buffer is to reduce potential impact from spraying of the banana plantations. The subdivision provides suitable and substantially vegetated setbacks from the northern undeveloped boundaries of the site. Existing vegetation is considered adequate to buffer the residential land from any spray drift from the adjoining banana lands.

6.7.9 Appropriate subdivision design

The subject land presents a gently undulating topography rising steeply in its northern extent. Overall, the subdivision has been designed with regard to the topography of the

site, with road layout generally corresponding with the topography. The northern most portion of the land exists as the steepest portion of the site and appears to be in excess of 20 per cent slope. The majority of development is proposed between the existing Lakes Estate subdivision and the developing Highlands Estate. This area is generally undulating with the lots designed to take advantage of the topography in terms of providing views, maximising solar orientation and providing for a variety of future dwelling designs.

Roads within the subdivision have been designed with specific consideration of topography, particularly in terms of providing adequate and safe access to all allotments, as well as providing suitable drainage. The subdivision design also contains slow points through sensitive areas such as interfaces with the existing native vegetation and points which the road network traverses the 7A zone. The rationale is to reduce potential impacts through these locations, and reduce traffic flow where possible. Roads have generally been designed to provide continuous movement, and as such cul-de-sacs and narrow accesses have been avoided, particularly in steeper areas.

Figure 64 - View north along the eastern boundary of the site with the location of stage 3 in the foreground.

Figure 65 - View north west across the steep northern portion of the subject land. Note the topography of this area in context to the road network and long axis of the allotments.

The northern most portion of the subdivision contains Stage 3 which offers differing allotment designs based on the greater topographical constraints. Stage 3 of the subdivision rises gently to the north with low to medium slope with steeper slopes at its northern portion. This area of the site is able to provide larger allotments with suitable area for future dwellings, with the road network able to provide safe and convenient access to all proposed lots.

The north western portion of the subject land contains the steepest portion of the subject land with significant slope constraints. The rationale of the design in this location is to provide large allotments with substantial provision for housing as well as sediment control and run-off devices to reduce erosion and land slip. The design of the allotments is such that the long axis of the allotments extends in the direction the slope, allowing adequate provision for dwellings to be sited within the proposed lots. The provision of Torrens title allotments is considered suitable in this instance based on the large rectangular allotments proposed. Dwellings within this area of the estate will be encouraged as pole houses with design guidelines implemented to control sediment during and post construction, as well as provision of services and appropriate provision of run-off and drainage design (see Figure 66 below).

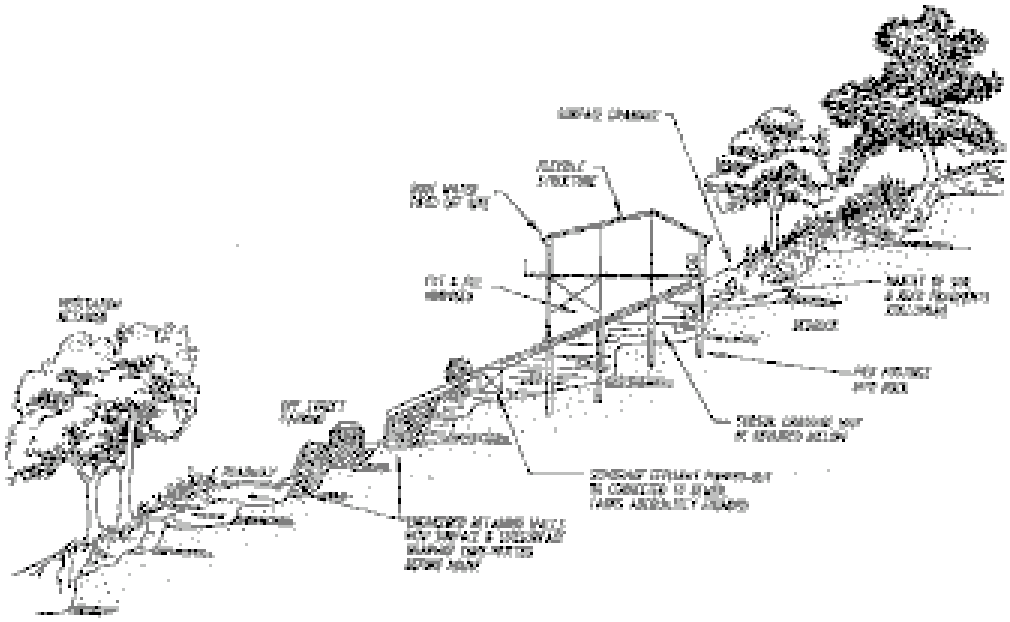

Figure 66 - Effective dwelling and sediment control design for steep land (Source: Coffey Geotechnics 2008)

An example of how a pole home responds to a sloping site is demonstrated in Figure 67.

Figure 67 Example of a pole house on sloping land (Source: Practical Pole Homes)

6.7.10 Mobility networks

The subdivision will include provision of pedestrian and cycle networks through the estate linking with existing networks. The pedestrian cycle network partial follows the internal road network, with some portions of its extent extending through the existing vegetation. Overall, the design of the pedestrian network provides linkages to all areas of the estate and including open space and recreation areas. The design allows suitable separation from the roadways whilst allowing adequate surveillance from the street and public areas. The design also allows the pedestrian network to direct access from all areas of the estate to the central lakes and open space areas. This pedestrian network will be accessible from all allotments, and will involve the internal footpath network, as well as some additional trails within the site, as identified in the below figure.

Where the pedestrian network extends through the 7A zone, pathways are likely to remain gravelled with fences provided to limit intrusion on the native vegetation.

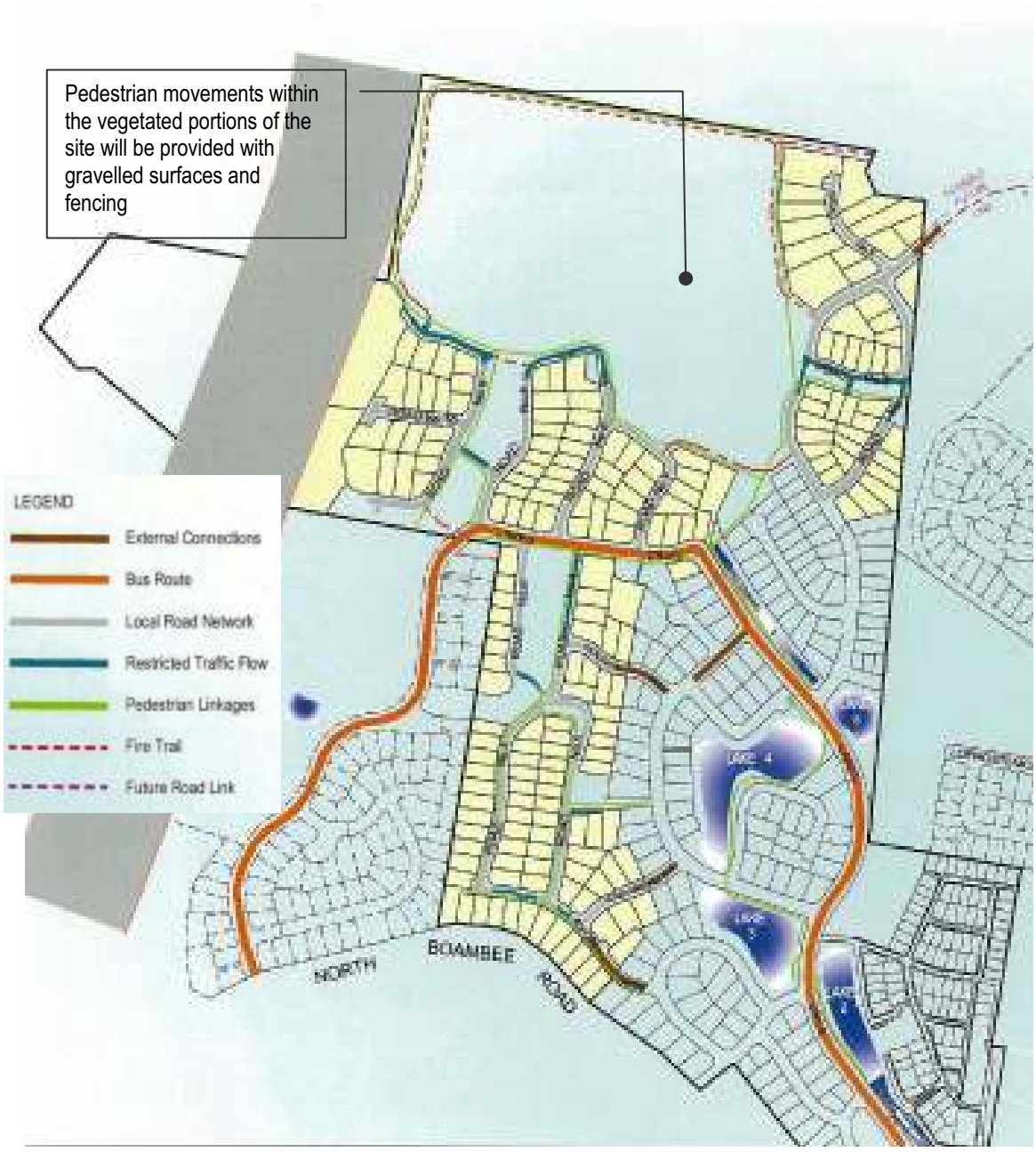

Figure 68 - Movement network for the entire Lakes Estate development. (Source: CPG Australia 2008)

6.8 NOISE

The subdivision adjoins North Boambee Road to the south and also the future alignment of the Pacific Highway by-pass to the west. This results in two potential noise sources.

North Boambee Road

North Boambee Road extends along the southernmost portions of Stage 1 and potentially impacts 12 allotments directly. These allotments which abut the street are orientated to face the internal roadways of the subdivision with north south orientation.

The TIAR prepared for the subdivision identifies peak daily traffic movements at 5,500 between Lakes Drive and the Pacific Highway. Given the predominantly rural land use west beyond Lakes Drive, it is considered that the traffic volume is lesser along its interface with the southern boundary of the proposed subdivision.

The subject slopes down to the north away from North Boambee Road which provides a natural buffer to the subject land. North Boambee Road is not visible from the subject land, and as such the natural topography is considered to lessen the potential noise impacts to future dwellings. Future landscaping works are also likely to be implemented along this interface by future lot owners.

Figure 69 - Current view of the Lakes Estate from North Boambee Road to the east of the proposed subdivision.

Pacific Highway

The future alignment of the Pacific Highway by-pass is proposed along the western boundary of the subdivision. The project is understood to be in concept plans stage, however the route has been selected and a concept design prepared. The western portion of the subject land is undulating and rises across the portion of land proposed as the highway corridor.

Figure 70 - View west across the western extent of the proposed subdivision. The future alignment of the Pacific Highway is indicated.

The alignment will extend across an easterly down slope exposed to the western extent of the subdivision. The alignment will be partial cut into the slope with the interface of the highway corridor with the subject land filled. The concept designs detail that small verges may be applied to eastern side of the highway corridor to separate the highway from the subject land. It is also anticipated that there is scope to implement noise barriers along the highway corridor to reduce potential noise impacts.

The Coffs Harbour By-pass Concept Design Report identifies the need for traffic noise mitigation. The mitigation techniques are in accordance with a Strategic Noise Assessment undertaken as part of the concept design report. The noise assessment provided four recommendations for noise mitigation being:

- Maximise shielding of the by-pass by use of existing terrain and the cut / fill configuration of the road alignment – indications within the Wilkinson Murray assessment is that this could be up to a 50% reduction in the zone of noise impact.
- Consider further shielding of the proposed alignment by the adoption of tunnels through major ridgelines instead of cuttings. This allows the height of embankment construction in adjacent valleys to be lowered.
- Provide noise mounds or combinations of mounds and low noise walls in noise sensitive areas such as North Boambee valley, north of Coramba Road near Spagnolos Road and through the Mackays Road valley.
- Use of elevated interchange ramps to provide noise mitigation in where the alignment is in close proximity to the Roselands Estate near the Coramba Road interchange.
- Adoption where necessary of sections of noise wall where mounds are not practical, such as the elevated structure over the North Coast Railway and on sections of the Korora to Sapphire upgrade. (emphasis added)

The report also provided a list of proposal for noise mitigation. In regards to the subject land, noise mitigation techniques have been suggested in the form of sound mounding and landscaping. The final details of these mounds and landscaping will be finalised during final design of the highway, and it is anticipated that the developer will negotiate with the RTA to the level of noise mounds and landscaping required.

Figure 71 – Concept design details of the future highway design. This design is likely at the interface of the subject land (Source: Connell Wagner/RTA 2008)

6.9 INFRASTRUCTURE PROVISION

6.9.1 Existing infrastructure capacity & proposed infrastructure

Sewer

The subject land exists across two catchment areas as defined by the *North Boambee Valley Information Sheet*. Catchment 1A includes land on the eastern developed portion of the Lakes Estate area and the north eastern corner at Roberts Hill Reservoir. Catchment 1B includes

Two sewer pump stations are provided for the development; pump station 50 which services central and eastern portion of the Lakes Estate including the constructed and partially developed areas of the estate; and pump station 50A which services the western portion of the land. The developed stages of the Lakes Estate in the south are provided with sewer mains extending from pump station 50 at North Boambee Road. A 300mm sewer main connects with this pump station, receiving from a 200mm sewer main which extends along the eastern side of Lakes Drive, servicing the existing retirement village and the approved stage adjacent to Lake 5. On the western side, a series of 150mm sewer mains service the existing development along the south western portion of the Lakes Estate and link with the primary 300mm main. The primary main also extends from the North Boambee Road frontage across the western side of the internal Lakes with 150mm sewer mains servicing individual allotments within the developed stages of the Lakes Estate. The provision of the existing sewer mains has had regard to future development of the Lakes Estate, and the North Boambee Valley area in general. As such, the estate is provided with sewer infrastructure capable of absorbing a greater load than currently exists.

The subdivision proposes a total of 198 allotments to be contained within each of the three catchments. Of the total number of lots, 104 will be contained within catchment 1A to the east. This is in addition to a further 138 allotments proposed or developed within the catchment. A partially constructed 225mm sewer main extends from the 300mm sewer main in the south east to an area just beyond Lake 5. This sewer main is proposed to be extended north through the previously approved stage of the Lakes Estate, with 150mm sewer mains servicing the proposed allotments. The steeper land in

the north east corner of the subject will be serviced by 150mm sewer mains received by the 225mm mains to the south. In the central portion of the land, 150mm sewer mains are proposed to link with the existing mains to service the proposed allotments. The lower portion of land at the current northern extent of Lakes Drive is proposed to be filled in order to allow the gravity reticulation system to function efficiently. The proposed infrastructure design has been based on anticipated maximum load and also the potential to receive from both catchments 1B and 2. The layout of the proposed sewer provision is provided within the Infrastructure Provision Engineering Report at Appendix GG.

Catchment 1B includes land west to the ridgeline and will also be serviced by a gravity reticulation system given the favourable slope provided on site. This area adjoins catchment 1A, and the gravity system will include 150mm mains to each proposed allotment, received by the infrastructure in catchment 1A, and finally by pump station 50 in the south. The eastern portion of stage 2 will require some filling to allow efficient function.

Figure 72 – Reticulated sewer strategy for Catchment 1A and 1B (Source: Resource Design Management 2007)

Catchment 2 includes proposed lots 87 – 109 within the far western extent of Stage 2, proposed Lots 1 – 4 and 27 -37 within Stage 1 and the adjoining Highlands Estate to the south east. Proposed lots within stage 1 are proposed to be connected to the proposed reticulated sewerage provisions within the adjoining land and connected to pump station 50A which is located within the adjoining Highlands Estate (see The proposed lots within Stage 2 will either be connected to pump station 50A which is located within the adjoining subdivision (Lot 2 DP1082747) or include provision of a new pump station and

rising main (see . The catchment will only include approximately 22 lots, and is able to be absorbed by the existing infrastructure.

Figure 73 – Reticulated sewer strategy for Catchment 2 (Source: Resource Design Management 2007)

Staging of the sewer reticulation system will be subject to the staging of the overall subdivision, and extended with each stage. The design of the subdivision staging program has had regard to providing the most efficient extension of infrastructure services.

Water

The existing constructed stages of the Lakes Estate are provided with 150mm water mains with 100mm mains servicing individual allotments. This existing design is consistent with the concept design contained within the *North Boambee Valley Information Sheet*. The design also has regard to future full development of the entire North Boambee Valley area.

The development includes a water supply framework which generally reflects the water supply servicing strategy contained within the North Boambee Valley Information Sheet. Allotments will be serviced by 100mm mains supply systems, linking back to the larger trunk system as shown in the water supply strategy layout contained within Appendix GG. Stage 3 which exists as much steeper land will obtain a connection from the 600mm water main which extends along the northern boundary. This allows the system to function more efficiently in the higher slopes of the subject land.

Figure 74 - Reticulated water supply design (Source: Resource Design Management 2007)

Staging of the water supply will also be in conjunction to the staging of the overall subdivision, and extended with each stage. The design of the subdivision staging program has had regard to providing the most efficient extension of infrastructure services.

Electricity

The electricity supply within the existing development of Lakes Estate is provided as underground. Currently, there are 66KV overhead powerlines extending from Lophostemon Drive to the east and from the existing rural dwellings to the west. A temporary connection has been provided within the subject land to connect these existing services while the estate is developed. This existing arrangement will be re-routed to an underground service between the existing permanent service on the western boundary of

the subject land and the eastern extent at Lophostemon Drive. Two options are proposed for the re-alignment and provided for agency determination.

1. ***Routing the alignment along the shortest route within the proposed road reserve system.***

   Underground alignment tracking approximately 160metres up the eastern side of Lakes Drive, turning into Road No. 8, and then Road No. 13, and following the future internal road system to meet the existing overhead line in the reserve adjacent to the western boundary of the development (see ***Figure 75*** *below).*

   The entire line is underground except for the entry exit connections, with a total length of approximately 650 metres. Proposal includes 4 x 90° changes of direction, however may be adjusted to accommodate the minimum radii allowed by the servicing authority.

   Issues raised by Clarence Consultants (refer ***Appendix GG****) are noted and may preclude agreement from the service authority to this proposed alignment.*

2. ***Routing the alignment along the shortest route within the proposed road reserve system and also using the reserve areas (Flora and Fauna linkages)***

   New alignment is provided underground along Lakes Drive (approximately 350 metres) and including the road crossing at that point into the reserve to the south west. Alignment tracks approximately 400 metres along the area zoned as reserve, and links with the existing overhead line in the reserve adjacent to the western boundary of the development (see ***Figure 76*** *below).*

   The total length of the alignment is approximately 750 metres and includes 2 x 90° changes of direction.

   Potential issues regarding changes of direction are also noted under this proposed alignment however are less severe than that of option 1. The changes of direction are predominantly in or next to "Reserve" areas. A possible variation to this option may include overhead lines adjacent to the reserve, which would remove the majority of the changes in direction issue. (Source: Resource Design Management 2008)

Figure 75 - Proposed Option 1 for underground re-routing existing 66KV electricity supply (Source: Resource Design Management 2007)

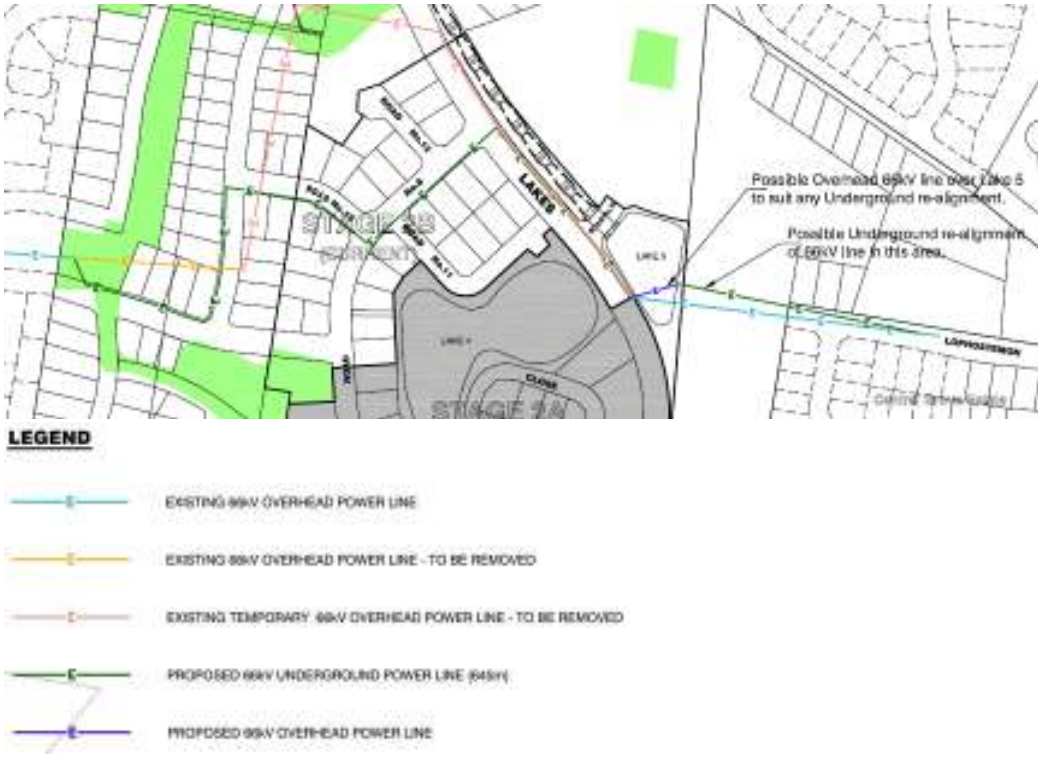

Figure 76 - Proposed Option 2 for underground re-routing existing 66KV electricity supply (Source: Resource Design Management 2007)

The electricity provision for the existing development within the Lakes Estate is via underground cabling along the property frontage of each allotment. This design will be extended throughout the proposed subdivision to service all allotments. Electricity will be provided in shared trenching where possible.

Telecommunications

The developed stages of the Lakes Estate include underground telecommunication services at the property frontage. This service provides telecommunications connection to all existing allotments. The proposed subdivision will provide an extension of the existing underground telecommunication services to service all proposed allotments. The staging of this service will be in conjunction with the staging plan developed for the overall estate, and is premised on providing an efficient and logical expansion of these services. The telecommunications services will be provided within shared trenching where possible.

Gas

Natural gas services are supplied to the existing Lakes Estate development via underground trenching at the property frontage. This existing service will be extended to service all proposed allotments within the subdivision. The extension of the service will be consistent with the proposed staging of the overall subdivision.

Waste disposal

Weekly kerbside waste disposal services are provided to the existing subdivision by Council. This service collects 240 litre household waste, recycling and green waste receptacles from the kerbside. This service will be extended within the proposed subdivision in consultation with Council and waste contractors. The steeper slopes of the north are likely to require a service consisting of a smaller truck access. It is understood that the waste contractors are able to provide this service and will be consulted to determine the most appropriate service to this location.

6.9.2 Requirements for underground servicing

Electricity, telecommunications, water supply and natural gas are proposed to be provided within underground trenches servicing all allotments. This design is such that connection to all allotments is provided in the most efficient and effective manner. The underground trenching will also allow shared provision of serviced where possible.

The soil conditions found on site are considered to permit underground trenching to be provided. The depth of the trenches will determined based on the soil conditions determined during construction of each stage.

6.9.3 Planning agreements

Much of the infrastructure necessary for the proposed subdivision will be subject to developer contribution charges. These contributions have been discussed in greater detail earlier in this EA. The relevant developer contributions are identified as:

1. North Boambee Valley Stage 1 Release Area Developer Contributions Plan
2. Wastewater Treatment & Carrier System Development Servicing Plan 2008
3. Water Supply Development Servicing Plan 2008

6.10 HERITAGE & ARCHAEOLOGY

6.10.1 Aboriginal heritage significance

A Cultural Heritage Assessment has been prepared for the proposed development and is attached to this EA. The assessment was undertaken in accordance with draft *Guidelines for Aboriginal Cultural Heritage Assessment and Community Consultation* and *Interim Consultation Requirements for Applicants*. In accordance with these documents, a development proposal for the Lakes Estate and an intention to prepare a Cultural Heritage Assessment at the Lakes Estate was forwarded to:

- *Coffs Harbour and District Local Aboriginal Land Council*
- *Gumbula Julipi Elders Aboriginal Corporation*
- *Yarrawarra Aboriginal Corporation*
- *The Garbay Elders*
- *The Mudjay Elders*
- *Gumbayngirr Warrior Elders of the Nambucca River*
- *Kulai Pre-school Aboriginal Corporation*
- *Stuarts Island Local Aboriginal Land Council/Stuarts Island Tribal Elders Descendants*
- *Gumbaynggirr Nation*
- *Gumbaynggirr Elders*
- *Mimi Mother Aboriginal Corporation*
- *Registrar of Aboriginal Owners, NSW Department of Aboriginal Affairs*
- *NSW Native Title Services*
- *The General Manager, Coffs Harbour City Council*
- *Department of Environment and Climate Change (DECC)*

Invitation for other Aboriginal groups to respond was placed in the Coffs Harbour Advocate on 24 October 2007. The CHDLALC, Mudjay Elders and Gumbula Julipi Elders responded to the requests and were endorsed as registered stakeholders in relation to the Lakes Estate Assessment.

A subsurface investigation report titled Archaeological Test Excavations at LE-PAD 1 and LE-PAD 2, and an Anthropological Assessment have also been prepared as a result of recommendations made within the initial Cultural Heritage Assessment.

The Cultural Heritage Assessment identified the Coffs Harbour as being first inhabited by the Gumbaingirr speaking people, who inhabited a large surrounding area along the coast. Coffs Harbour also exists within an overlap of Torresian region, typical of tropical northern Australia, and the Bassian region, typical of temperate southern Australia. As a result, the area represents a rich flora and fauna habitat which provided Aboriginal

people with food, medicinal supplies and other materials. It is suggested that forests, creek lines and wet areas of Coffs Harbour were abundant with indigenous groups.

Natural plant species and resources have been identified within the subject land and are predominantly contained within the heavily vegetated and un-modified area contained within the 7A Environmental Protection zone. The natural resources of the North Boambee Valley are also identified as suitable tool making materials.

Six aboriginal sites are identified within a two kilometre radius of the site and are listed on the DECC Aboriginal Heritage Information Management System (AHIMS). These sites are all located external of the site, with one site within an adjoining property to the west. No sites are listed on the Commonwealth and National Heritage Lists, maintained by the Commonwealth *Department of Environment, Water, Heritage and the Arts*. In addition, no sites were located within the *NSW State Heritage Register*, Schedule 2 of the *North Coast Regional Environmental Plan 1988* or Schedule 5 of the *Coffs Harbour Local Environmental Plan 2000*. It has been noted that three unregistered sites have been recorded within a two kilometre radius of the site, but external of the boundaries.

The subject land represents previous uses for intensive farming processes; including banana plantations, some cropping and pasture, in addition to extensive activities such as stock grazing. Development has also occurred including a small dwelling on the eastern boundary and previous storage sheds associated with agricultural use of the site. As a result, the subject land has been subject to land modifying uses which have compromised the remainder of any aboriginal artefacts or sites. In addition, the acidic soils of the North Boambee Valley are likely to have degraded any bone, shell or charcoal deposits.

Field surveys of the site reveal the location of stone artefacts and two potential archaeological deposits. Two further locations were identified by Mudjay Elders during site visits.

Stone artefact scatter were identified within the western portion of the site within Stage 2 along the tree line (identified as LE-A1 – Stone artefact scatter and LE-PAD 1 - refer to **Figure 79** below). The site contains 11 surface artefacts along a 20 metre extent (see **Figure 77** below). This area is proposed for development as an access road to the eastern extent of residential development in this stage. The Gumbula Julipi Elders requested subsurface testing of this area prior to the commencement of any development works in this area. Subsequent subsurface archaeological testing was undertaken at this location with artefacts identified within the study area. The archaeological subsurface testing report concluded that the area has a low artefact density and its lack of spatial integrity, structure and contents diversity, the area is not recommended for a comprehensive salvage and investigation program. The report also suggested that an amendment to the layout of the subdivision is not necessary. Subsequently, the development of the subdivision within 50 metres of this area will be monitored by Aboriginal stakeholder representatives with artefacts recovered during construction collected by the representatives for deposition in the adjoining Environment Protection area. DECC will also be informed of the deposited position of recovered items.

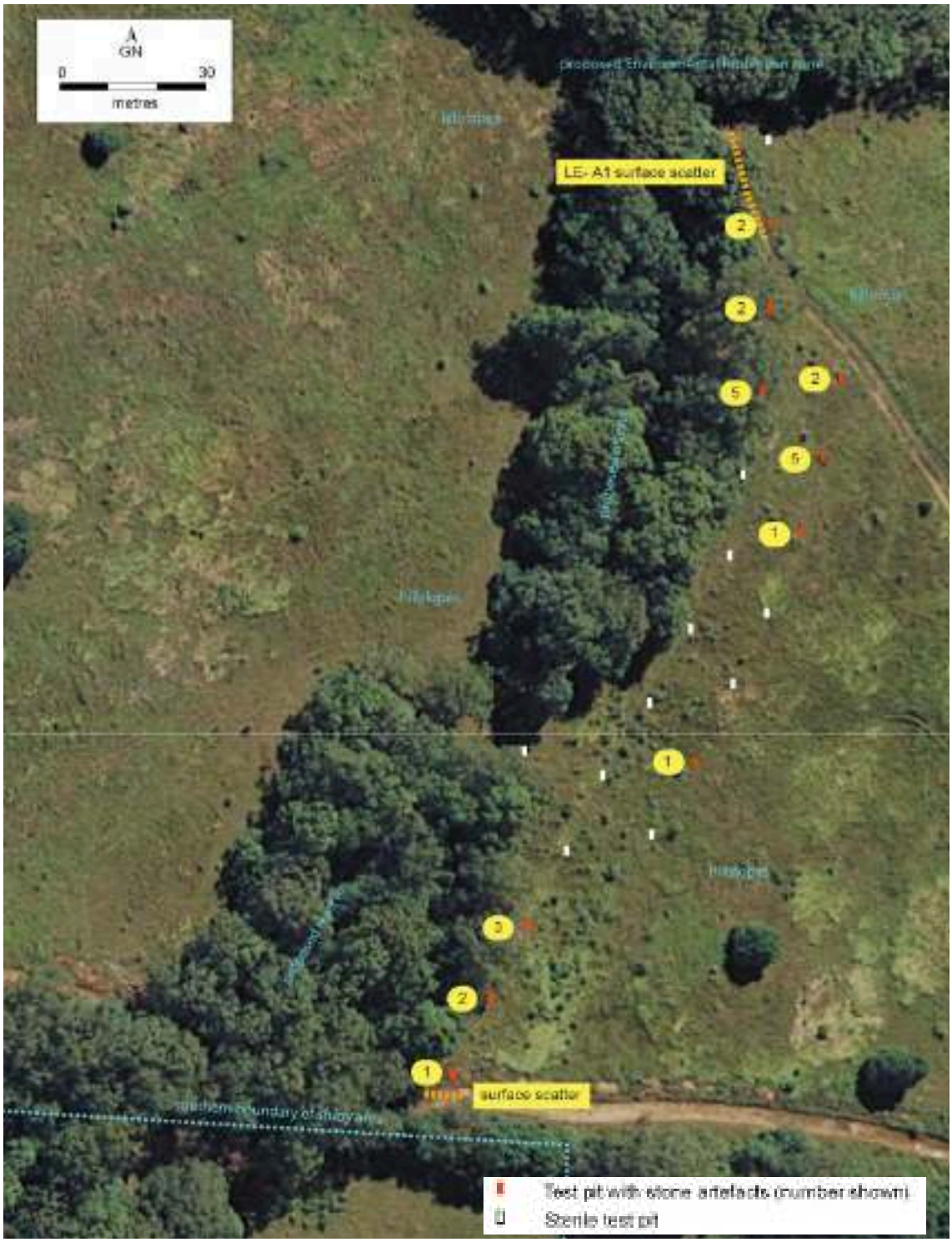

Figure 77 - Subsurface testing of LE-PAD1 with location of identified artefacts shown (Source: Jacqueline Collins 2008)

A second area (identified as LE-PAD 2) was identified along the tree line in the north eastern portion of the subject land (see **Figure 79** below). No artefacts were discovered during field investigations, however the Coffs Harbour Local Aboriginal Lands Council (CHLALC) and the Gumbula Julipi Elders consider the site to have some potential of subsurface evidence of Aboriginal occupation. Based on the recommendations of the initial *Cultural Heritage Assessment*, a sub-surface investigation was carried out within the location of LE-PAD 2. The results of the subsurface testing of this area suggested the area had been substantially disturbed, however 16 artefacts were discovered. As similar to LE-PAD 1, the artefact density is relatively low. The area will be built upon under the proposed subdivision, however the conclusions of the *Archaeological test excavations for LE-PAD 1 and LE-PAD 2* prepared by *Jacqueline Collins Consultant Archaeologist* in June 2008, suggest that the nature of this site does not warrant protection as any further cultural/scientific value is unlikely. The development of the subdivision within 50 metres of this area will be monitored by Aboriginal stakeholder representatives with artefacts recovered during construction collected by the representatives for deposition in the adjoining Environment Protection area. DECC will also be informed of the deposited position of recovered items.

Figure 78 - Subsurface testing of LE-PAD2 with location of identified artefacts shown (Source: Jacqueline Collins 2008)

A traditional campsite was identified at the south eastern corner of the subdivision at the interface of North Boambee Road (identified as LE-PAD 3 - see **Figure 79** below). This area is located at the base of the former road reserve (Lot 1 DP1089778). The site has since been used for intensive banana plantations and is currently vacant with tall grass, weeds and some shrubs. The assessment of the site determined that given the highly modified nature of the site, the potential for any archaeological significance was restricted to artefacts which were likely to have been severely *dispersed throughout the topsoil and lacking any spatial integrity*. The site has been acknowledged by the CHLALC and the Mudjay Elders as having a high level of spiritual significance. However, given the lack of knowledge of the campsite and previous disturbance, the site was assessed by the CHLALC and the Mudjay Elders not to represent any significant heritage value. An anthropological investigation was requested by the Aboriginal stakeholders.

A further campsite was identified within Stage 2 of the subdivision, within the central northern area of the subject land (identified as LE-PAD 4 - see **Figure 79** below). The surrounding area includes cattle yards and vehicle tracks, however the campsite is generally undisturbed, however is considered to have been subject to some less intensive agricultural activities. Considering this, it has been determined that the location may contain some spatially intact artefacts. The Mudjay Elders assessed the site to be a traditional campsite and an Anthropological Assessment was requested in addition to the identified site at LE-PAD 3.

An Anthropological Assessment has been prepared and is attached to this EA. The purpose of the assessment is to accompany the Cultural Heritage Assessment and to respond to areas of concern expressed by the Mudjay Elders and in accordance recommendation 3 of the Cultural Heritage Assessment. The Anthropological Assessment concluded that none of the four sites identified should necessarily be designated as an Aboriginal place, from an Anthropology perspective. This is based on the lack of any groups having specific status as traditional owners of the site, the matter being at the discretion of the developer and consent authority and the author's belief that the significance of the sites were largely attributable to the lack of recognition given to Aboriginal places and the visible signs of ancestral activity in the region. The assessment did however acknowledge the importance of some recognition being made on site where possible.

Having regard to the conclusions of the specialist assessments, the proposal does not seek to retain any of the identified sites based on the highly disturbed nature of the site and the lack of knowledge from traditional owners of the site as well as the suggestion that little cultural values will be derived from the sites. It is considered necessary to acknowledge the Aboriginal culture of the area, and the proposal seeks to retain a small park in the northern portion of the subdivision, with acknowledgement of the local Aboriginal culture. In addition, the construction of the subdivision will involve recovery of artefacts and deposition within the adjoining vegetated conservation areas.

Figure 79 - Location of identified indigenous and non-indigenous sites within the subject site (Source: Jacqueline Collins 2008)

6.10.2 European heritage significance

The Cultural Heritage Assessment also includes an assessment of European heritage of the subject land.

Searches have been undertaken of the Australian Heritage Database, the National Trust of Australia (NSW) Register, the NSW State Heritage Register, and heritage schedules of the North Coast Regional Environmental Plan 1988 and Coffs Harbour LEP. These searches revealed no heritage items of sites within the subject land or surrounding locations. Consultation has also been undertaken with local historians and researchers, which revealed no known potential historic items or archaeological artefacts of deposits.

Ten items of European heritage value were discovered during field investigations, of which all recorded items took the form of standing dead tree stumps. The stumps reflect hand-felling techniques, and use of springboards to reach desired cut-off points. The Cultural Heritage Assessment suggested that the recorded stumps were likely to be associated with logging undertaken during the 1892 construction of the Coffs Harbour

jetty and dated around 1919. The stumps also contained notches, suggestive of springboard notches.

Four of the 10 stumps were identified external of the conservation area, and subsequently require removal during construction and subsequent development of the estate. Of these four stumps, three are in poor condition and one in moderate condition. All stumps exhibit some degradation due to burning, rot of termite infestation. All 10 stumps were assessed in accordance with the NSW Heritage Council's criteria and gradings of significance. The assessment determined the degraded nature of the stumps did not warrant inclusion on any heritage register, however it has been determined that the moderate condition of the stump provides potential for its relocation and interpretation for educational purposes.

The proposal will relocate the notched tree stump (identified as LE-H8 in Figure 6 of the *Cultural Heritage Assessment* prepared by *Jacqueline Collins Consultant Archaeologist* in June 2008) to the adjacent conservation area and provided with interpretative signage. The relocation of the stump will involve sawing of the stump at ground level.

7 DRAFT STATEMENT OF COMMITMENTS

In accordance with Part 3A of the EP&A Act, the following commitments are made by Noubia Pty Ltd following the preparation of this EA and the recommendations and conclusions of the accompanying specialist documentation. The commitments are made to reduce the potential impacts as a result of the development of the Lakes Estate.

Table 23 - Draft Statement of Commitments

ISSUE	COMMITMENT	RESPONSIBLE	TIMEFRAME
Development	The development of the subdivision will be undertaken in accordance with the subdivision layout prepared by CPG Australia dated June 2009 and with the EA report prepared by Habitat Planning and dated July 2009 (including attached appendices).	Noubia Pty. Ltd.	Construction and operation
	A Construction Management Plan ("CMP") will be prepared for each stage of civil construction works associated with the subdivision and will be prepared prior to construction of each respective Stage of the proposed subdivision.	Noubia Pty. Ltd.	Prior to construction of stage 1
Flora and Fauna	Construction and operation of the proposed residential subdivision will be in accordance with the recommendations of the *Flora and Fauna Report* prepared by Eco-Logical Australia and dated October 2007 at Appendix BB.	Noubia Pty. Ltd.	Construction and operation
	Vegetation removal for development of proposed lots, roads and other infrastructure within Primary and Secondary Koala habitat areas or identified corridors and remnant vegetation including where isolated clumps of trees occur will be restricted only to those areas shown on the plan labelled 'Vegetation Removal Areas' as prepared by CPG Australia and dated April 2009	Noubia Pty. Ltd.	Construction and operation
	All vegetation which is identified as Primary or Secondary Koala habitat, remnant vegetation or within identified corridors and occurs within created allotments; will not be removed for future residential development. This will be restricted through use of a covenant within s88B Instruments.	Noubia Pty. Ltd.	Construction and operation
	No vegetation will be removed to establish or maintain Asset Protection Zones for proposed allotments.	Noubia Pty. Ltd.	Construction and operation

ISSUE	COMMITMENT	RESPONSIBLE	TIMEFRAME
	Water Sensitive Urban Design features are included within the proposed subdivision design where there is potential for urban run-off into bushland.	Noubia Pty. Ltd.	Construction
	All domestic animals kept in association with future residential development must be registered with Council and not allowed outside the property unless on a lead or other restraint. This will be enforced through use of a covenant within s88B Instruments, and advisory signage will also be established within the estate.	Noubia Pty. Ltd.	Operation
	The internal road network will include slow points and traffic calming devices, as identified on attached plans, to reduce traffic speeds at locations which interface with habitat corridors, primary and secondary koala habitat	Noubia Pty. Ltd.	Construction
	Tree planting of koala feed trees in accordance with the *Coffs Harbour Koala Plan of Management* dated November 1999 to offset vegetation removal within the subject land as a result of construction within the area identified as location '1' in Figure 10 of *Flora and Fauna Report* prepared by Eco-Logical Australia and dated October 2007 at Appendix BB.	Noubia Pty. Ltd.	Construction
	Building envelopes which reduce potential vegetation removal will be specified on all allotments identified as containing existing vegetation and located within the area identified as Location '4' in Figure 10 of *Flora and Fauna Report* prepared by Eco-Logical Australia and dated October 2007 at Appendix BB. This will be implemented through covenants to be included within s88B Instruments.	Noubia Pty. Ltd.	Approval of Linen Plans, Operation
	Where vegetation is removed within the subject land, compensatory tree planting will be provided at a rate of 5 to 1 for Very High Ecological Value Vegetation, 4 to 1 for High Ecological Value vegetation, 2 to 1 for Medium Value vegetation and 1 to 1 for Low Ecological Value vegetation. Vegetation classes are determined from the Vegetation Development Control Plan	Noubia Pty. Ltd.	Construction
Conservation Areas	Unless acquired by the Coffs Harbour City Council, the balance 7A – Environment Protection zone within the subject land will remain in the ownership of Noubia Pty. Ltd. and will be maintained by the owner of the allotment.	Noubia Pty. Ltd.	Construction and operation
Water Cycle Management and Watercourse	Construction and operation of the proposed residential subdivision will be in accordance with the conclusions and recommendations of the *Stormwater Constraints Assessment* prepared by Umwelt Pty Ltd in November 2008	Noubia Pty. Ltd.	Construction and operation

ISSUE	COMMITMENT	RESPONSIBLE	TIMEFRAME
	Construction of a new detention pond (identified as Pond G2 within figure 3.2 of *Stormwater Constraints Assessment* prepared by Umwelt Pty Ltd at Appendix FF)adjacent to the adjoining subdivision to the south to contain and treat stormwater to appropriate quality will be constructed to service the proposed portion of the subdivision contained within the western catchment. Construction of the pond will be in accordance with the *North Boambee Valley Detention Pond Environmental Impact Statement* prepared by Gutteridge, Haskins and Davey Pty Ltd in August 1997. Noubia Pty Ltd will consult with Coffs Harbour City Council prior to construction in regard to funding of the construction.	Noubia Pty. Ltd. & Coffs Harbour City Council	Prior to construction of Stage 3
	Part 3A permits will be sought from the Department of Water and Energy for earth works associated with stages 2 and 3.	Noubia Pty. Ltd.	Prior to construction of stages 2 and 3
	All future dwellings will be constructed with a freeboard of 500 millimetres above the determined 1 in 100 year flood level. This will incorporated into estate design guidelines and covenants to be included within s88B Instruments.	Noubia Pty. Ltd. & Coffs Harbour City Council	Operation
Natural Hazards and Contamination	Construction and operation of the proposed residential subdivision will be in accordance with the recommendations of the *Preliminary Geotechnical, Acid Sulphate Soil and Environmental (Contamination and Status) Assessment* prepared by Coffey Geotechnics and dated 27 February 2008 and attached at Appendix CC.	Noubia Pty. Ltd.	Construction and operation
	Further soil testing of the area surrounding the former potential machinery shed will be undertaken at a greater density in accordance with the NSW EPA (1997) Guidelines relating to banana cultivation, to determine the extent of the soil contamination and potential soil plume and spatial distribution will be undertaken prior to a Construction Certificate.	Noubia Pty. Ltd.	Prior to construction of stage 1
	Further soil testing of the vertical extent of contamination within all former banana plantation areas identified by the *Preliminary Geotechnical, Acid Sulphate Soil and Environmental (Contamination and Status) Assessment* prepared by Coffey Geotechnics and dated 27 February 2008 and attached at Appendix CC.	Noubia Pty. Ltd.	Prior to a construction certificate for each respective stage
	A Remediation Action Plan for remediation of contaminated soils will be prepared and actioned prior to Construction Certificate	Noubia Pty Ltd.	Prior to a construction certificate for each respective stage

ISSUE	COMMITMENT	RESPONSIBLE	TIMEFRAME
	Provision of construction management details for earthworks required for constructions of roads within land in excess of 15 per cent. These are to be prepared as part of the Construction Management Plan.	Noubia Pty. Ltd.	Prior to construction of stage 1
	Building envelopes will be specified on all allotments which are identified as flood prone. This will be implemented through covenants to be included within s88B Instruments.	Noubia Pty. Ltd.	Approval of Linen Plans, Operation
	Pole houses will be required for lots 181 – 196. This will be implemented through covenants to be included within s88B Instruments applicable to these allotments.	Noubia Pty. Ltd.	Approval of Linen Plans, Operation
	Construction and operation of the proposed residential subdivision will be in accordance with the recommendations of the *Bushfire Risk Assessment* prepared by Australian Bushfire Protection Planners Pty Ltd dated June 2008 and attached at Appendix AA.	Noubia Pty. Ltd.	Construction and operation
	The development of the subdivision will include provision of Asset Protection, provided to the future lots adjacent to the bushfire prone vegetation to the minimum widths as determined in Tables 2 – 4 and as shown diagrammatically on Figure 8 [page 27; Figure 9 [page 29] and Figure 10 [page 31] of the *Bushfire Risk Assessment* prepared by Australian Bushfire Protection Planners Pty Ltd dated June 2008 and attached at Appendix AA.	Noubia Pty. Ltd.	Construction of each stage.
	The ongoing management of the estate will include maintenance of the Asset Protection Zone as an Inner Protection Area in accordance with Appendix 5 of *Planning for Bushfire Protection 2006* and the NSW Rural Fire Service's *"Specifications for Asset Protection Zones"*.	Noubia Pty. Ltd.	Operation
	An 88B Covenant, in accordance with the provisions of the *Conveyancing Act 1919*, shall be created on the title of the future lots burdened by the Asset Protection Zones to ensure the ongoing management of the landscaped gardens/residual vegetation, in accordance with the prescriptions of an Inner Asset Protection Zone.	Noubia Pty. Ltd.	Approval of Linen Plans for each stage, Operation

ISSUE	COMMITMENT	RESPONSIBLE	TIMEFRAME
	All future dwellings erected on those lots which are adjacent to the bushfire prone vegetation and which are impacted by the provision of the recommended Asset Protection Zones shall be constructed with a minimum construction standard of Level 3, in accordance with the specifications of Australian Standard A.S 3959 - Second Edition 1999 and Amendment 1, 2000, *"Construction of Buildings in Bushfire Prone Areas"*.	Noubia Pty. Ltd & Coffs Harbour City Council	Operation
	Future dwellings located within 100 metres of the bushfire hazard interface shall be determined during the preparation of the subdivision documentation.	Noubia Pty. Ltd.	Construction
	The development will include public access constructed to comply with the deemed-to-satisfy provisions of Section 4.1.3(a) of *Planning for Bushfire Protection 2006*	Noubia Pty. Ltd.	Construction and operation
	The development will include fire access trails constructed to comply with the deemed-to-satisfy provisions of Section 4.1.3(c) of *Planning for Bushfire Protection 2006*. The formed width shall be 4.0 metres with an additional metre provided to both sides and kept clear of grasses and shrubs. Locked fire trail access gates shall be provided at the intersection with the public road network.	Noubia Pty. Ltd.	Construction
	The development will include extension of the existing water supply main to service the future residential development, in accordance with the specifications of Australian Standard A.S 2419.2. All hydrants shall have a flow rate of 10 litres / second with blue pavement marks provided to locate hydrant positions.	Noubia Pty. Ltd.	Construction and operation
	The development will ensure all fire hydrants shall be accessible and located such that a tanker can park within a maximum distance of 20 metres from the hydrant and the habitable building must be located such that a fire at the furthest extremity can be attacked by fire-fighters using two 30 metre hose lines and a 10 metre water jet. The hydrants will be allocated with regard to allowing a clear unobstructed path of 90 metres between the hydrant and the most distant point of the building.	Noubia Pty. Ltd.	Construction and operation
	The development will include blue hydrant markers to locate the positions of the hydrants and shall be positioned on the hydrant side of the centreline of the road pavement.	Noubia Pty. Ltd.	Construction

ISSUE	COMMITMENT	RESPONSIBLE	TIMEFRAME
Traffic Management and Access	Construction and operation of the proposed residential subdivision will be in accordance with the recommendations of the *Traffic Impact Assessment Report* prepared by John Piper Traffic and dated November 2008 and attached at Appendix EE.	Noubia Pty. Ltd.	Construction and operation
	Appropriate traffic calming devices for bus movement will be installed along Lakes Drive to complement the proposed treatments at the wildlife crossing corridors and to ensure motorists travel at an appropriate speed.	Noubia Pty. Ltd.	Construction and operation
Character of Area and Subdivision Pattern and Layout	Construction and operation of the proposed residential subdivision will be in accordance with the proposed subdivision layout prepared by CPG Australia dated August 2008 and attached at Appendices T - V.	Noubia Pty. Ltd.	Construction
	Street tree planting will be undertaken in accordance with the Landscape Concept Plan prepared by POD Landscape Architecture dated September 2008 and attached at Appendix DD.	Noubia Pty. Ltd.	Construction and operation
	Development of future dwelling houses within Lots 76, 77, 101, 103, 120, 190 and 198 will be restricted to the portion of the lot identified as 2A Low Density Residential Zone. This will be implemented through restrictions and/or covenants to be included within s88B Instruments.	Noubia Pty. Ltd.	Approval of Linen Plans for each stage
Noise	Negotiation between the proponent and the RTA will be undertaken to determine noise mitigation measures as part of the Pacific Highway bypass. These mitigation measures will be included within the design and construction of the Highway bypass. The proponent will have regard to these future works within the construction of the subdivision.	Noubia Pty. Ltd. and Roads & Traffic Authority	Construction
	Tree planting will be undertaken in accordance with the Landscape Concept Plan prepared by POD Landscape Architecture, with particular emphasis on the western boundary of the proposed subdivision.	Noubia Pty. Ltd.	Construction
Infrastructure	Construction and operation of the proposed residential subdivision will be in accordance with the conclusions and recommendations of the *Engineering Assessment* prepared by Resource Design Management in December 2007 and amended November 2008.	Noubia Pty. Ltd.	Construction
	Negotiation will be held with Council and relevant service providers to determine the extent of electricity, gas and telecommunications provision and extension of the existing service.	Noubia Pty. Ltd.	Prior to construction

ISSUE	COMMITMENT	RESPONSIBLE	TIMEFRAME
Heritage	Construction and operation of the proposed residential subdivision will be in accordance with the recommendations of the *Cultural Heritage Assessment* prepared by Jacqueline Collins Consultant Archaeologist dated November 2008 and attached at Appendix Z.	Noubia Pty. Ltd.	Construction and operation
	Construction and operation of the proposed residential subdivision will be in accordance with the recommendations and conclusions of the Anthropological Assessment prepared by Dr. Gaynor Macdonald dated July 2008 and attached at Appendix S.	Noubia Pty. Ltd.	Construction and operation
	Conservation of a spatially intact portion of the artefact site defined as LE-PAD1 within the document titled *Archaeology test excavations at LE-PAD 1 and LE-PAD 2*prepared by *Jacqueline Collins Consultant Archaeologist* in June 2008.	Noubia Pty. Ltd.	Construction
	Aboriginal Stakeholder representatives should be engaged to monitor all initial development-related earthworks within a 50 metre radius of the site LE- A1 surface scatter and LE-PAD 2 (as shown on Figures 6 and 7 of document titled *Archaeology test excavations at LE-PAD 1 and LE-PAD 2*prepared by *Jacqueline Collins Consultant Archaeologist in June 2008*) to enable the culturally-appropriate collection of any artefacts exposed by these earthworks.	Noubia Pty. Ltd.	Construction
	CHDLALC will be advised of any disturbed archaeological items. CHDLALC will advise DECC of deposited position of all recovered archaeological items to allow DECC AHIMS records to be amended.	Noubia Pty. Ltd. & CHDLALC	Construction
	The proponent will consult further with the Mudjay Elders regarding the conservation and interpretation of the campsites at PAD's 3 and 4 in areas dedicated as open space out of respect for their spiritual beliefs.	Noubia Pty. Ltd.	Prior to construction
	If human remains are located during the project, all works must halt in the immediate area to prevent any further impacts to the find or finds. The local police, the Aboriginal community and DECC are to be notified. If the remains are found to of Aboriginal origin and the police consider the site not an investigation site for criminal activities, DECC should be contacted and notified of the situation and works are not to resume in the designated area until approval in writing is provided by DECC. In the event that a criminal investigation ensues works are not to resume in the designated area until approval in writing from the Police and DECC.	Noubia Pty. Ltd.	Construction

ISSUE	COMMITMENT	RESPONSIBLE	TIMEFRAME
	If further Aboriginal cultural objects are uncovered due to the development activities, all works must halt in the immediate area to prevent any further impacts to the find or finds. A suitably qualified archaeologist and Aboriginal community representatives must be contacted to determine the significance of the find(s). The site is to be registered in the AHIMS (managed by DECC) and the management outcome for the site included in the information provided to the AHIMS.	Noubia Pty. Ltd.	Construction
	All reasonable efforts must be made to avoid impacts to Aboriginal Cultural Heritage values at all stages of the development works. If impacts are unavoidable, mitigation measures are to be negotiated with the Aboriginal community and DECC.	Noubia Pty. Ltd.	Construction
	If objects are uncovered the applicant must consult with and involve Aboriginal representatives for the project, in the ongoing management of the Aboriginal Cultural Heritage values.	Noubia Pty. Ltd.	Construction
	An Aboriginal Cultural Education Program must be developed for the induction of personnel and contractors involved in the construction activities on site. The program should be developed in collaboration with the Aboriginal community.	Noubia Pty. Ltd.	Prior to construction
Developer Contributions	Developer contributions will be made in accordance with the relevant sections of the North Boambee Valley Stage 1 Release Area Developer Contributions Plan 2008, Wastewater Treatment & Carrier System Development Servicing Plan 2008 and Water Supply Development Servicing Plan 2008.	Noubia Pty. Ltd.	Prior to release of subdivision certificate.

8 CONCLUSION

The proposed development involves further stages of the existing residential estate known as the Lakes Estate. The subdivision includes subdivision of Part Lot 95 DP1129227, Lot 1 DP1089778, Lot 2 DP607602 and Part Lot 10 DP1071628 into 198 allotments. The existing vegetation within the conservation areas of subject land will be retained, and where vegetation is removed, offset planting will be provided at an appropriate rate specified by Council's development control plans.

The objective of the development is to facilitate development of later stages of the overall Lakes Estate area, and to provide increased development of the North Boambee Valley release area. The subject land exists of the south western fringe of the Coffs Harbour urban area and is suitably located to provide appropriate expansion of the urban area.

The above Environmental Assessment demonstrates the proposed development is consistent with the Director General's Environmental Assessment Requirements, the Coffs Harbour Local Environmental Plan 2000 and relevant Development Control Plans. The proposal is considered to be justified in this instance as:

- The proposed development is consistent with the relevant statutory and regional and local strategic planning framework;
- The proposed development is supported by local, regional and state strategic planning frameworks including the draft Mid North Coast Strategy and the Our Living City settlement strategy;
- The proposal provides a logical expansion of the Coffs Harbour urban area within a preferred growth area of Coffs Harbour;
- Existing infrastructure can be extended in an environmentally and economically efficient manner to ensure appropriate servicing of all proposed allotments including steep land;
- The proposed development has demonstrated it will have limited impact upon the existing high ecological value vegetation and habitat areas contained on site, and is considered to represent a development which will enhance the conservation of such areas;
- The removal of vegetation within the subject land can be offset to ensure to the ecological and habitat value of the site is retained;
- The development represents increased investment in residential land within Coffs Harbour and has direct social and economic benefits to the LGA through increased population and expenditure within the region;
- The development is consistent with the proposed Pacific Highway bypass route and the proposed works associated with the bypass route; and
- The subdivision provides a layout which will facilitate future buffer works to the proposed highway bypass including sound mounding and vegetation planting.