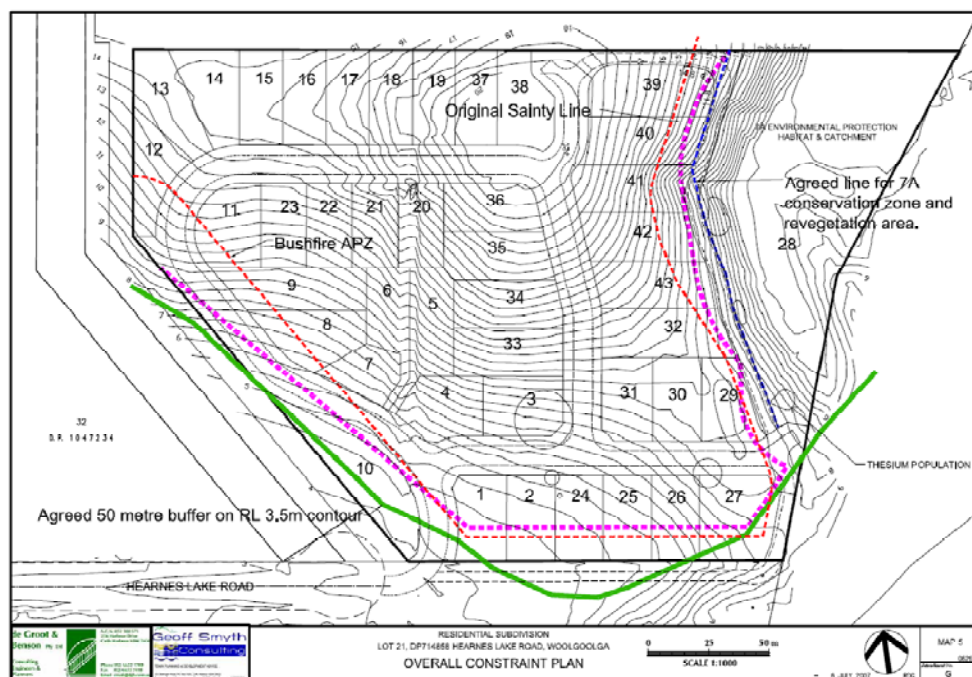


5.2 Subdivision Design/Layout and Desired Future Character

The proposed subdivision design and layout responds to the buffers adopted by the Hearnese Lake/Sandy Beach DCP and those identified on the “Environmental Constraints & Development Potential Map, Lot 21 DP 714858, 45 Hearnese Lake Road, Woolgoolga (Sainty and Associates, September 2006). Where development is proposed outside the identified future development potential areas a detailed justification is provided with technical arguments in “A Review of the Sainty and Associates (2006) Report Environmental Constraints Analysis, Lot 21 DP 714858, 45 Hearnese Lake Road, Woolgoolga” Eco Logical Australia March 2007.

The plan below shows where the proposal varies from the “Sainty” line.



The Eco Logical Australia review advises that ELA has identified a number of errors in interpretation and mapping in the Sainty report, as well as a number of omissions and overlooked details. While the Sainty report provides a broad overview of issues related to the subject site, it cannot provide the accuracy or detail that a substantial level of site-based field inspection can provide.¹

¹ Eco Logical Australia, A Review of the Sainty and Associates (2006) report 'Environmental Constraint Analysis Lot 21 DP 714858, 45 Hearnese Lake Road Woolgoolga'. March 2007 p12

ELA considers that the current DA for the subject site generally conforms to the recommendations of the Sainty report, apart from areas where the Sainty mapping is incorrect, or where other more detailed and ecologically consistent advice is available. Specifically:

- The Sainty report recommended buffer on the freshwater wetland is considered to approximate that proposed in the current DA. The Sainty report omits discussion of the site stormwater management system proposed in the DA. The proposed stormwater management system is considered by WBM Oceanics to represent current best practice, and is intended to considerably enhance the ecological function of the proposed vegetated buffer to the wetland;
- The Sainty report recommended buffer to the Hearn's Lake ICOLL is supported and is already incorporated into the current DA for the subject site;
- The Sainty report recommended buffer for the SEPP 26 Littoral Rainforest adjacent to the subject site is not supported, as ecologically-based advice from CHCC ecologist states that a minimum 5m vegetated buffer is adequate to protect the littoral rainforest from edge effects. The CHCC ecological advice maximises the intended ecological function of this buffer, rather than adopting an arbitrary distance with no specific, site-based solutions for the prevention of edge effects. Furthermore, WBM Oceanics advises that, for water quality purposes, a buffer on the littoral rainforest is not required, as the rainforest itself is separated from the subject site by the freshwater wetland, which is already protected by a vegetated buffer. Notwithstanding the above comments, the current CHCC and Eco Logical-agreed buffer to the wetland also provides a buffer of at least 25m from the mapped SEPP 26 Littoral Rainforest. ²

The proposed subdivision is considered to adequately respond to the buffers required by the Hearn's Lake/Sandy Beach DCP and those proposed by the Sainty Report as amended through further site survey and consultation with officers of CHCC.

The previous section has undertaken a detailed assessment of the proposed subdivision design and layout against CHCC Hearn's Lake/Sandy Beach

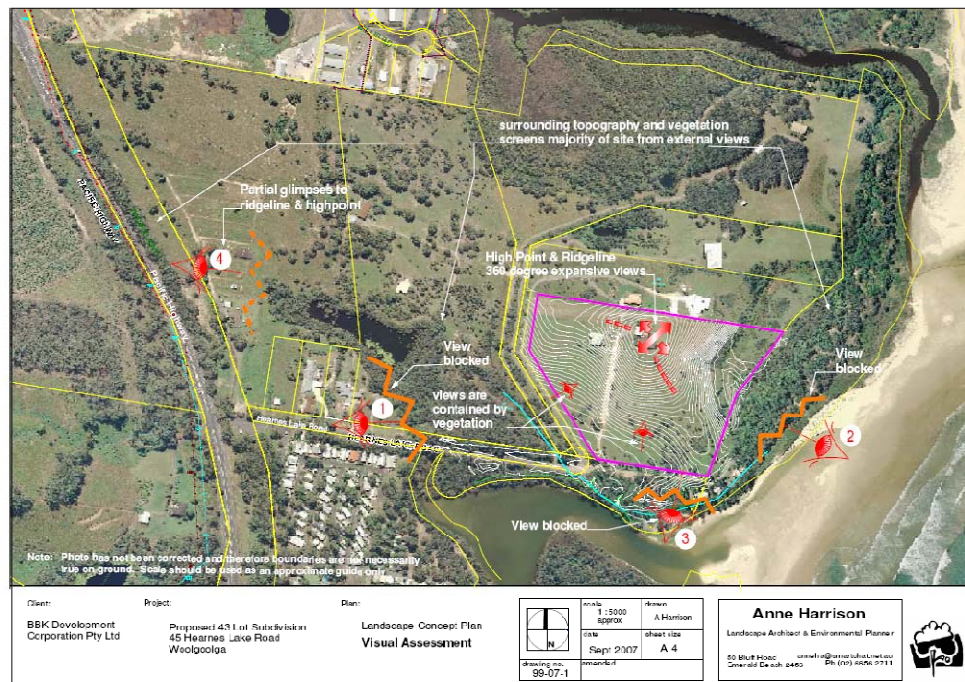
² Ibid.

The proposed development forms part of a broader residential release area as detailed in the Hearnese Lake/Sandy Bay DCP which includes the land to the west and north/west of the subject site. The proposed development has been designed with this broader residential subdivision in mind so that the proposal integrates with the future residential development and utilises the connections to the existing infrastructure of Woolgoolga. This includes the future collector road which will link the development to the north and through the previous Sawmill site and on to Bosworth Road.

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5.3 Visual Impact

A visual impact assessment has been prepared by Anne Harrison Landscape Architect. The drawing below summarises the visual considerations as which apply to the site.³



An external view analysis was conducted from Hearn's Lake Road (view point 1), Hearn's Lake Beach (view point 2), Hearn's Lake picnic area (view point 3) and along the Pacific Highway (viewpoint 4). These are the four public locations to which alterations to the site may be potentially viewed.

From Hearn's Lake Road views to the site are entirely screened by the area of vegetation growing in association with an adjoining low lying property. This vegetation is to be zoned 7A Environmental Protection by Coffs Harbour City Council as shown in the Hearn's Lake / Sandy Beach Development Control Plan. This vegetation is also mapped as Secondary Koala Habitat and will be maintained if not strengthened by future management regimes. The retention of this vegetation guarantees that the

³ Anne Harrison – Landscape Architect Landscape Concept Plan & Visual Assessment, 45 Hearn's Lake Road Woolgoolga 2007 p6

development will always be afforded screening from Hearn's Lake Road and the Pacific Highway.⁴



View taken from Hearn's Road/Pacific Highway turnoff. Roadside planting and vegetation in middle ground screens the site from view

View half way along Hearn's Lake Road with view into site completely screened by vegetation



Due to a combination of topography and vegetation the site cannot be seen from Hearn's Lake Beach, therefore there is no assessable impact of the proposed subdivision. This will not change in the future, as the land in front of the subdivision is either protected as part of the Coffs Coast Regional Park network or as part of the Marine Solitary Islands National Park.⁵

⁴ Ibid p8

⁵ Ibid. p9



A series of viewpoints taken from Hearn's Lake beach. The topography of dunes combined with vegetation totally obscures any views of the site.



A distant view taken from Hearn's Lake Beach over the Lake and up towards the site. Day visitor area and leasehold lots are visible but the site is still not apparent even from a distance.

Due to a combination of topography and vegetation the proposed subdivision cannot be viewed from this location. Filtered views from the upper car park area are possible. It will be important to retain existing vegetation and perhaps strengthen this planting to ensure the impacts of the subdivision are minimised in and around the day visitor area. It is not part of this proposal however to put forward plans for the car park and picnic area as it is under State and Local Government management control and beyond the scope of this Landscape Plan. ⁶

⁶ Ibid. p10



Views from Hearn's Lake Day Picnic Area up towards the site, which is screened from view

Filtered views of the high point and ridgeline of the estate are visible at fleeting moments along the Pacific Highway. It is expected that rooflines along the ridgeline will be partially visible from the Pacific Highway but that the impact of this change will not be dominant or in anyway change the essential character of the view as it is experienced now.⁷



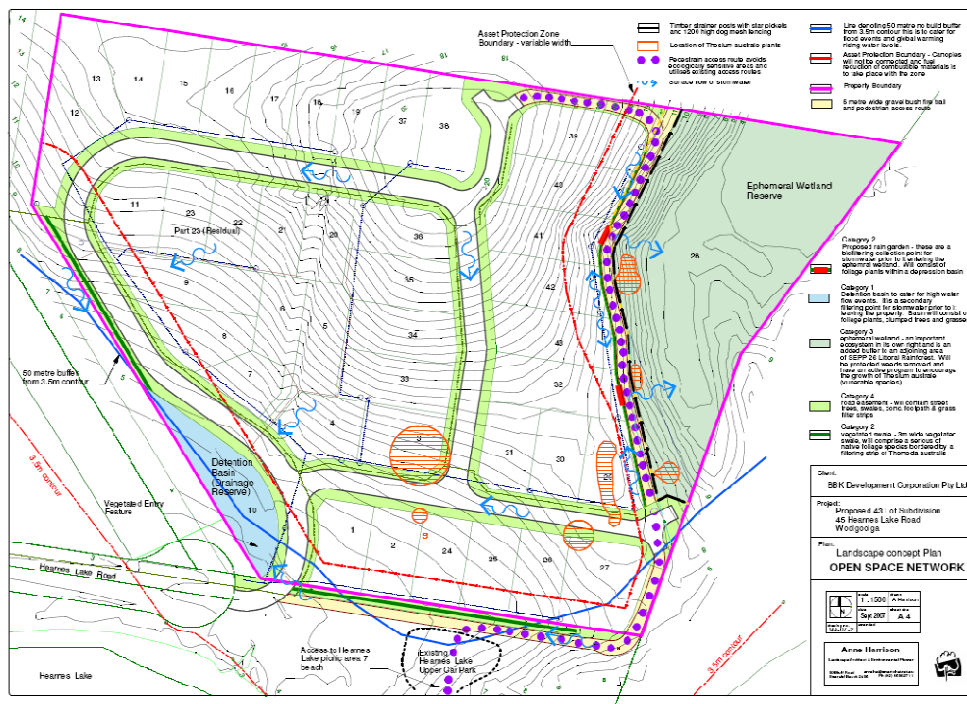
Camber on road combined with roadside vegetation screens view of site. Glimpses of ridgeline and rooflines will be visible from highway but alterations to skyline will not dominate view.

The site has some steep slopes that will require sensitive building design to nestle any building development into the topography. The site's visual absorption capacity is low to moderate, as the steep slopes combined with lack of vegetation mean that any form of development will be apparent. The containment of the site on the western boundary by vegetation will help visually contain development within the property. Street tree planting and the proposed detention basin area in the south west corner of the property will also be important to giving a soft vegetated character to the estate. Based on absorption capability alone, development on the site would have a moderate to high impact, however because the site is not readily visible from external areas the overall visual impact is low to moderate. The site has low to moderate visual impact essentially because it cannot be readily seen from any public use areas. Buildings on the ridgeline have the potential

⁷ Ibid p10

to be visually prominent only when viewed internally within the estate or far out to sea.⁸

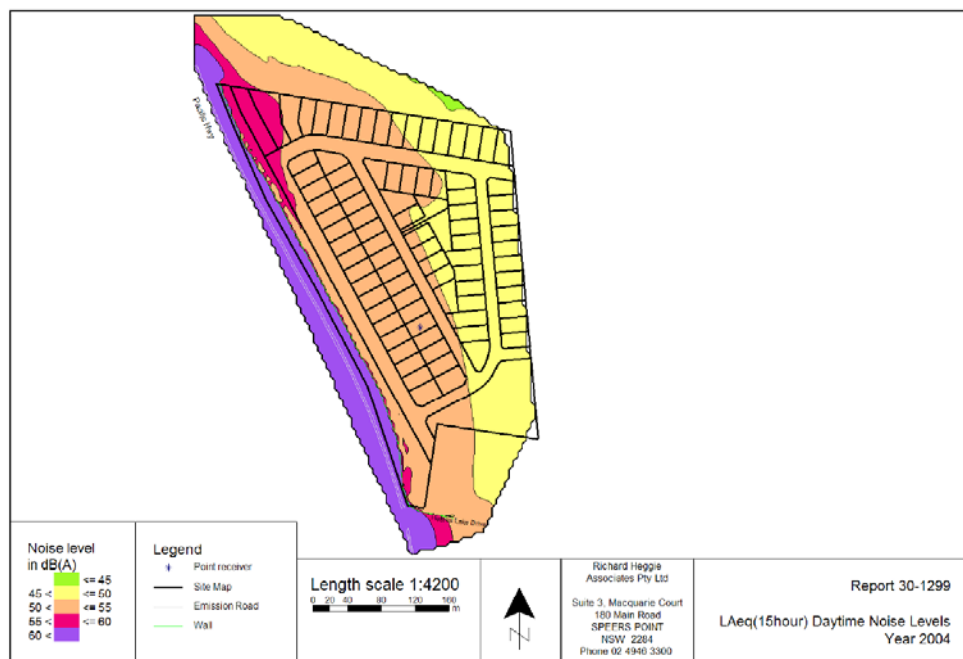
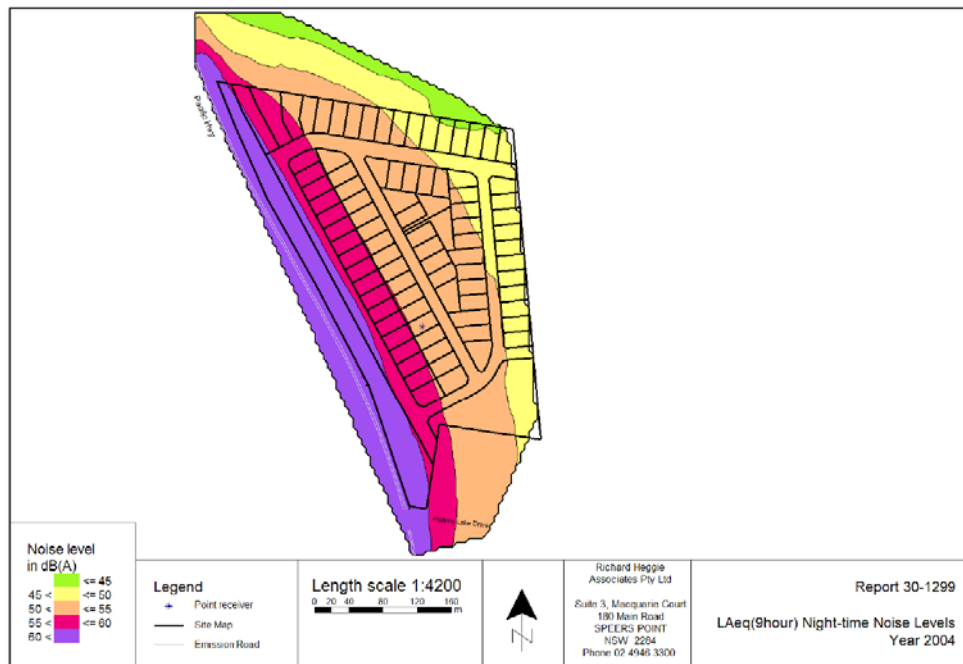
The visual impact of the proposed subdivision is considered to have been appropriately addressed and where necessary ameliorated by landscaping and planting patterns reflected in the plan below.



⁸ Ibid. p11

5.4 Noise

A noise assessment report has been prepared by Heggies for the proposed residential site to the west known as 1 Hearnese Lake Road. The report conducted noise logger tests and modelled the noise environment.⁹



⁹ Heggies, Road Traffic Noise Assessment, Hearnese Lake Road, Woolgoolga June 2008 p3

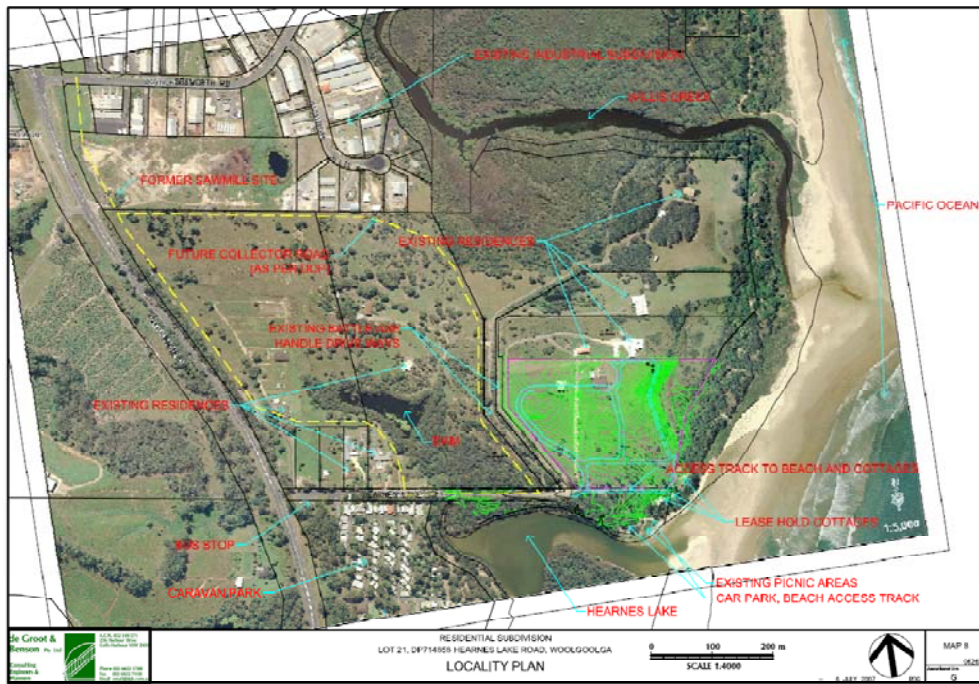
The report concluded that noise levels in the vicinity of the eastern boundary of that site were less than 50dBA both at night and during the day. The Road Traffic Noise Criteria for residential land use suggest that 55dBA for daytime and 50dBA for nighttime are the noise level goals.

Road Traffic Noise Criteria for Residential Land Uses

Type of Development	Criteria		
	Day 7am - 10pm (dBA)	Night 10pm - 7am (dBA)	Where Criteria Are Already Exceeded
New residential land use developments affected by freeway/arterial traffic noise	L _{Aeq} (15hour) 55 dBA	L _{Aeq} (9hour) 50 dBA	Where feasible and reasonable, existing noise levels should be reduced to meet the noise criteria via judicious design and construction of the development. Locations, internal layouts, building materials and construction should be chosen so as to minimise noise impacts.

Road traffic noise predictions show that the subject site will not be impacted by road traffic noise, with reference to the ECRTN, assuming 2018 traffic volume information and that the Pacific Highway alignment remains the same as it is currently.

It is anticipated that the Pacific Highway upgrade and realignment will be completed prior to 2018. The potential impacts of this have previously been considered as part of the EIS for the Pacific Highway project. The *Roads and Traffic Authority: Sapphire to Woolgoolga Environmental Assessment Part 11* provides noise contour predictions for 2021, inclusive of noise barriers. These indicate that road traffic noise levels are predicted to be less than the relevant criteria across the entire 45 Hearn Lake Road site.



The proposal is not considered to require any noise mitigation measures as a result of road traffic noise.

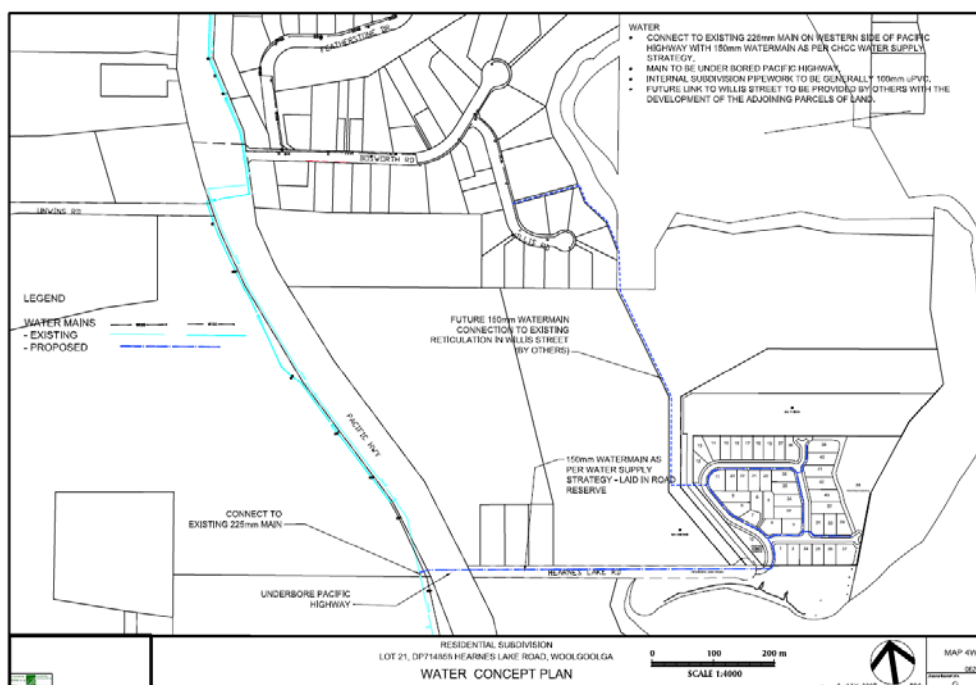
5.5 Infrastructure Provision

5.5.1 Water Supply

The provision of water supply to the site is dealt with in the Coffs Harbour City Council Water Supply Infrastructure report. That report investigates the augmentations required to service the projected growing population for Coffs Harbour City.

For the development and the surrounding area, the report proposes the following:

- Provide a 150mm water main link from the existing 225mm main located on the western side of the Pacific Highway. It will be necessary to underbore the highway to prevent disruption to traffic on the highway.
- The 150mm main is to be extended along Hearnese Lake Road to the development site.
- All internal subdivision pipework to be generally 100mm upvc.
- In addition, a future link to Willis Street is to be provided by others. This would occur with the development of the adjoining parcels of land.

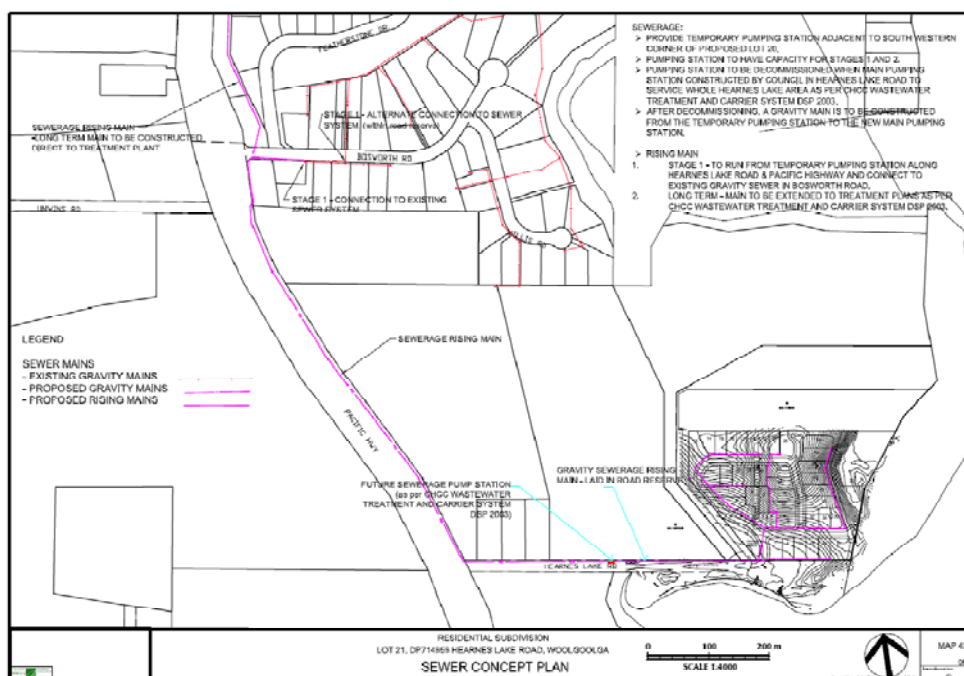


The application proposes to provide the water supply infrastructure in accordance with the CHCC Water Supply Infrastructure Report. The

infrastructure is proposed to all be installed in a single stage. The applicant proposes to forward fund that portion of the works connecting the site via Hearnes Lake Road to the water main link on the western side of the Pacific Highway. Part of the cost of these works will be recouped when the surrounding identified future development areas are subdivided.

5.5.2 Sewerage

The provision of sewerage to the site is dealt with in the Coffs Harbour City Council Wastewater Treatment and Carrier System Developer Services Plan 2003. That report investigates the augmentations required to service the projected growing population for Coffs Harbour City.



This report proposes that a sewerage pumping station be located approximately midway between the Pacific Highway and the development site, on private land owned by others. Negotiations to date by the Developers with the landowners have so far not yielded any agreement between the parties for the use of this land for a pumping station. As such, in consultation with Coffs Harbour City Council, two strategies have been developed. These are summarised below:

Strategy A – Construction in accordance with DSP

Gravity sewerage

- Provide a sewerage pumping station as shown in the DSP.
- Construct a 150mm gravity sewerage main from the site to the pumping station. The gravity main would be located in Hearn's Lake Road.
- Internal sewerage would be in accord with Council's Subdivision guidelines.

Sewerage Rising Main

The main would be constructed in two stages:

- Stage 1 - to run from the pumping station along Hearn's Lake Road and the Pacific Highway and connect to existing gravity sewer in Bosworth Road.
- Long Term – The rising main would be extended to Treatment Plant as per Coffs Harbour City Council Wastewater Treatment and Carrier System Developer Services Plan 2003.

Strategy B – Alternate Strategy

Gravity sewerage

- Either:
 1. Provide temporary pumping station adjacent to south western corner of proposed lot 20 if the site for the permanent pumping station shown in the DSP cannot be acquired. This pumping station is to be decommissioned when main pumping station is constructed by Council in Hearn's Lake Road to service whole Hearn's Lake area.
 2. Provide a permanent pumping station in the road reserve as close as possible to the location shown in the DSP.
- Construct a 150mm gravity sewerage main from the site to the pumping station.
- Internal sewerage would be in accord with Council's Subdivision guidelines.

Sewerage Rising Main

The main would be constructed in two stages:

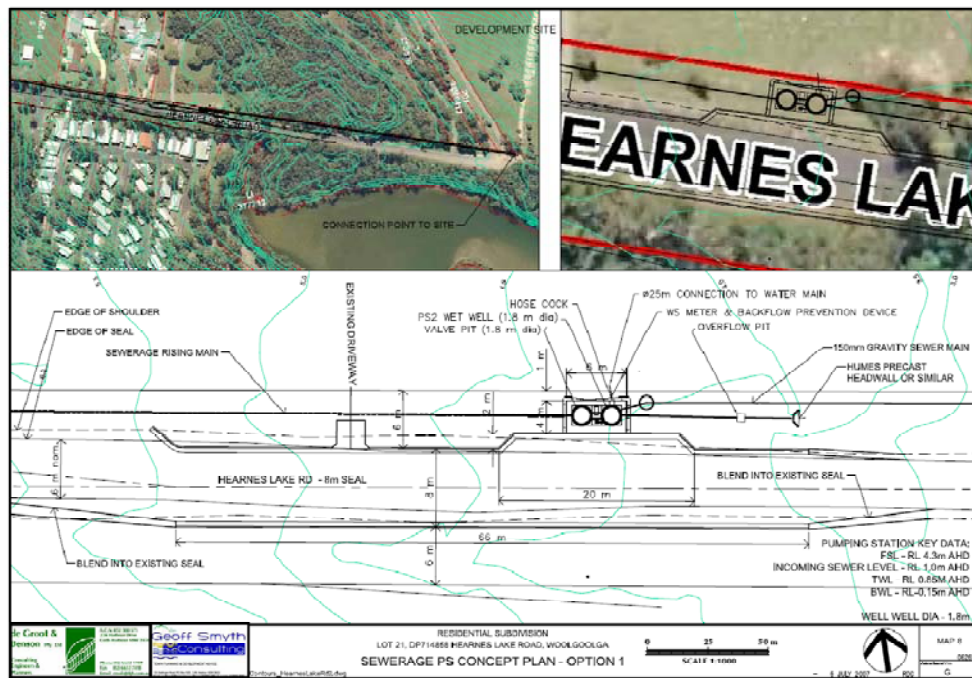
- Stage 1 - to run from the pumping station along Hearn's Lake road and the Pacific Highway and connect to existing gravity sewer in Bosworth Road.
- Long Term – The rising main would be extended to Treatment Plant as per Coffs Harbour City Council Wastewater Treatment and Carrier System Developer Services Plan 2003.

The application proposes to provide the sewerage infrastructure in accordance with the CHCC Waste Water Treatment and Carrier System Developer Services Plan. The applicant has undertaken discussions with the owners of the private land designated for the sewer pumping station under the Hearnese Lake/Sandy Beach DCP without being able to reach any agreement. Consequently, the applicant has provided CHCC with two alternate plans. CHCC has advised by letter dated 7 July 2007 that if agreement cannot be reached for location of the sewer pumping station on the private land in accordance with the DCP then the alternate plan locating the sewer pumping station within the road reserve would be acceptable. The letter states:

With regards to your letter dated 3 July 2007, Council's preferences for the provision of Sewerage Services to the above development are described below:

1. Council's preferred strategy is for construction of the Sewerage Pumping Station to be constructed on private land, in the position as indicated in the Hearnese Lake/Sandy Beach Development Control Plan.
2. In the event that issues make option 1 impractical, Council will support the construction of the Sewerage Pumping Station within the Hearnese Lake Road, road reserve. The concepts forwarded by de Groot and Benson are generally acceptable. Issues such as the size of the wet well, odour control and the compliance to Council's Standard Pumping Station will need to be addressed in the detail design. This Pumping Station and associated infrastructure shall be in accordance with my letter to de Groot and Benson of 21 May 2007, (copy attached).
3. Council will only support the option of a temporary private pumping station in the event that other options were exhausted.

It is considered that CHCC should exercise its acquisition powers under the Local Government Act and acquire the land to facilitate the DCP. However, given that two years has lapsed since the adoption of the DCP without any action by CHCC to acquire the land for its implementation, and given that CHCC agree to the option locating the sewer pumping station within the road reserve, it may be more timely and cost effective to pursue that solution as shown in the plan below.



The sewer infrastructure is proposed to all be installed in a single stage. The applicant proposes to forward fund that portion of the works connecting the site via Hearnese Lake Road and the Pacific Highway to the gravity sewer in Bosworth Road. Part of the cost of these works will be recouped when the surrounding identified future development areas are subdivided.

The site is currently served by power and telecommunications. The proposal includes amplification of these existing services to provide for the proposed subdivision.

The proposal is considered to adequately provide for infrastructure.

5.6 Traffic and Access

A Traffic Report has been prepared by RoadNet Pty Ltd dated December 2007 giving consideration to the proposed access arrangements and in particular the intersection of Hearn's Lake Road and the Pacific Highway.

The report advises that Information supplied by the RTA indicates that the proposed Pacific Highway bypass may commence in the next 5 to 7 years. It is understood from information provided by Council and the RTA that an interchange may be provided in the vicinity of (but not at) Hearn's Lake Road as part of the Highway Upgrading works.¹⁰

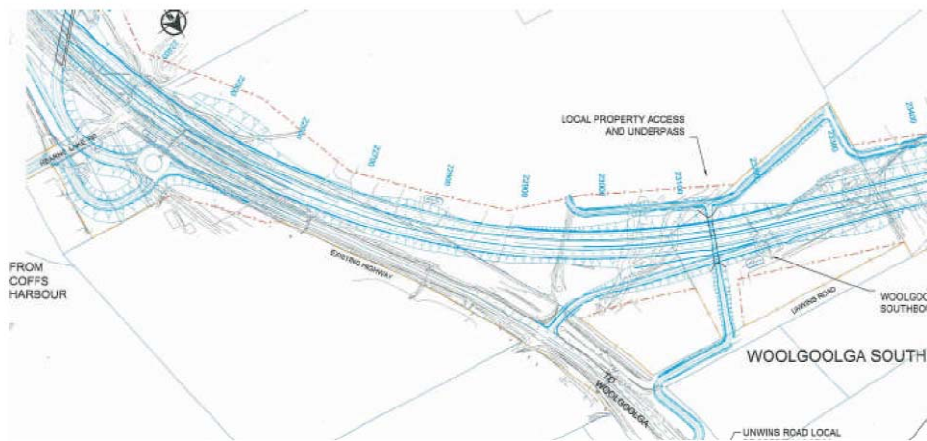


Figure 2 Proposed Hearn's Lake Rd intersection details

The Hearn's Lake/Sandy Beach DCP restricts the development of the northern precinct to a maximum of 80 lots until such time as the Pacific Highway by-pass works are complete or an alternate access is provided via Bosworth Road and the Pacific Highway. The subject development being for 41 lots is well within the 80 lot restriction. However, the traffic study has been carried out to determine the safety of the Hearn's Lake Road/Pacific Highway intersection.

Traffic counts were carried out in November 2007 which indicated:

Peak Hour AM traffic movements in 2007 were 3% less than in 2003.
Peak Hour PM traffic movements in 2007 were 5% less than in 2003

¹⁰ RoadNet Pty Ltd, Traffic Impact Assessment revision, Hearn's Lake Road, Woolgoolga Dec 2007 p1.

The Hearnese Lake Road junction currently operates at a level of service 'B' in normal traffic conditions with an average delay to the right turn movement of 20 seconds in the peak hour.

The Hearnese Lake Road junction would operate at a level of service 'C' in average traffic conditions in 5 years time (year 2008) with an average delay to the right turn movement of 31 seconds in the peak hour. This assumes completion of 41 lots of the subdivision and the current Highway traffic flow would increase by an annual rate of 600 vehicles per day.

In 10 years time under average traffic conditions the junction would operate at a level of service 'C' with an average delay to the right turn movement of 38 seconds. This assumes completion of 180 lots. The amount of traffic that would turn right onto the Highway from Hearnese Lake Road when the subdivision is fully developed is 75 vehicles per hour (just more than one car per minute), which is not a high volume.¹¹

The report confirms discussions with the RTA which has agreed to allow access to the subdivision via Hearnese Lake Road while the number of new lots on Hearnese Lake Road remains below 80.¹²

It is considered that the proposed access to the subdivision via the Hearnese Lake Road and Pacific Highway intersection is satisfactory.

Permissive Occupancy Access

There are currently a number of permissive occupancies located on the Crown land to the south-east of the subject site and accessed from an unmade track at the end of the sealed portion of Hearnese Lake Road.

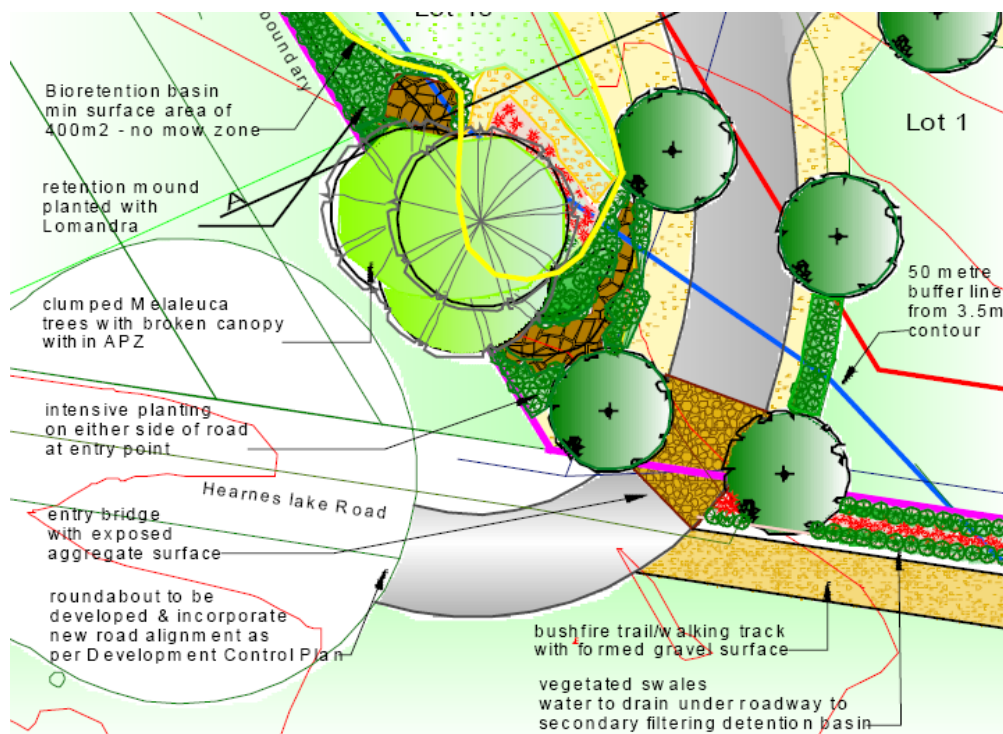
¹¹ Ibid. p1

¹² Ibid. p2



View of the end of Hearn's Lake Road showing the start of the track providing access to the permissive occupancies.

The proposal includes the construction of a bus turning circle at the end of Hearn's Lake Road. A fire trail is proposed beyond the bus turning circle which will continue to give access to the permissive occupancies without formalising the road. The bushfire trail will be kept locked with access only provided for the Bushfire Services and the permissive occupancies.



Beach Access

The beach access is currently provided via an unmade road from the end of Hearn's Lake Road giving access to the beach, picnic area and parking. The proposal does not intend to create any new access points.



It is considered that the traffic and access issues are satisfactorily resolved in the current proposal.

5.7 Hazard Management and Mitigation

A report has been prepared by Patterson Britton and Partners Pty Ltd giving consideration to Coastal Processes and hazard definition.¹³ It is noted that detailed report was commissioned from WBM Oceanics by CHCC for Hearn's Lake and the Environs. The findings of this report informed the strategy adopted in the Hearn's Lake/Sandy Bay DCP which has in turn informed the current proposal.

5.7.1 Coastal Processes

The report concludes that there is strong evidence for reducing recession rates moving north along beaches in the vicinity of Hearn's Lake Beach as well as relatively low recession rates in the region generally. The photogrammetric data also confirmed that all six beaches near to Hearn's Lake Beach appeared to be stable or accreting at their northern ends over the period of record of 30 to 50 years.¹⁴ A study of aerial photography has evidenced that seaward of the subject property the vegetation line has generally migrated seaward since 1943 and south of the subject property is generally stable.¹⁵ There is consistent evidence that Hearn's Lake Beach has been accreting over the past 61 years and the relative stability of Hearn's Lake Beach is expected to continue into the future.

The report noted that none of the permissive occupancies has been under threat from coastal erosion during the past 45 years and that the storm demand at the subject property is particularly low possibly because the beach profiles are relatively flat.¹⁶

The report gave consideration to the effects of climate change on sea level rises and modelled conditions for the subject site. The study adopted a sea level rise of 0.2m at 2054 and 0.5m at 2104, these values being consistent with the Intergovernmental Panel on Climate Change predictions for upper limit rises.¹⁷

Consideration has been given to coastal inundation hazard. It is noted that the existing dunes seaward of the proposed development are generally a few

¹³ Patterson Britton & Partners Pty Ltd, 45 Hearn's Lake Road, Woolgoolga Coastline Hazard Definition and Lake Entrance Processes October 2004

¹⁴ Ibid. p44

¹⁵ Ibid. p45

¹⁶ Ibid. p49

¹⁷ Ibid. p56

metres above 9m AHD. Consequently, the coastal inundation hazard at the subject property is considered to be negligible for the 100 year AFI storm event. There are no minimum habitable floor level requirements for the proposed development from a coastal engineering perspective.¹⁸

It is considered that the proposal satisfactorily addresses coastal processes.

5.7.2 Contamination

A geotechnical assessment has been prepared by Holmes and Holmes Pty Ltd for the subject site, which considers contamination in particular.¹⁹

The report notes that the land has previously been used for grazing purposes which is not considered to pose any significant risk of contamination to the soil. The CHCC mapping of former banana plantations indicates there have been no banana plantations on the site.²⁰

It is considered that the site is suitable for residential use.

5.7.3 Acid Sulphate Soils

A geotechnical assessment has been prepared by Holmes and Holmes Pty Ltd for the subject site, which considers acid sulphate soils in particular.

The Soil Conservation Service 1:25000 Moonee Beach Map identifies the ephemeral wetland as an estuarine swamp with a high probability of acid sulphate soils occurring within one metre of the surface. However, given that this area is to be retained as a wetland and undeveloped the occurrence of acid sulphate soils is seen as irrelevant.²¹

While no other potential area of acid sulphate soils has been mapped the report does note that the poorly drained low lying area on the adjoining site where the Hearn Lake/Sandy Bay DCP proposes the sewer pumping station to be located may have the potential for acid sulphate soils. The report recommends further testing in this location if the sewer pumping station is located in this position.²²

¹⁸ Ibid. p63

¹⁹ Holmes and Holmes Pty Ltd, Geotechnical Assessment for Proposed Residential Development at Hearn Lake, Woolgoolga August 2003

²⁰ Ibid. p3

²¹ Ibid. p3

²² Ibid.p3

The site and the proposal are considered satisfactory in terms of acid sulphate soils.

5.7.4 Bushfire

A bushfire protection assessment has been carried out by Australian Bushfire Protection Planners Pty Ltd for the site and the proposed development.²³

The Coffs Harbour Bushfire Prone Land Map indicates that a small portion of bushfire prone vegetation is located within the eastern portion of the site with the site being impacted by the buffer zone to bushfire prone vegetation on the Coastal Dunes to the east, the Littoral Rainforest in the Hearnese Lake Foreshore Reserve to the south and the Category 1 Bushfire Prone Vegetation on the land to the west of the site.

The site is therefore deemed to be bushfire prone and for the purpose of addressing the provisions of Section 45 – Plan Preparation – Hazards of the *North Coast Regional Environmental Plan*, to be subject to the impacts of a bushfire hazard.

The widths of the Asset Protection Zones provided by the perimeter road/fire trail/Asset Protection Zone and building setback exceed the deemed-to-comply setbacks provided by Table A2.5 of *Planning for Bushfire Protection 2006*, required for Level 3 construction of the future dwellings which adjoin the bushfire hazard.²⁴

The report makes the following recommendations with respect to Bushfire Safety:

- That the minimum construction to the future dwellings shall be Level 1 in accordance with the specifications of Australian Standard A.S 3959 -1999 *“Construction of Buildings in Bushfire Prone Areas*.
- The future residential subdivision of the land will have a reticulated water supply connected to the Coffs Harbour Council mains. The dwellings in the future subdivision of the land will be connected to

²³ Australian Bushfire Protection Planners Pty Ltd, Bushfire Protection Assessment for the Proposed Torrens Title Residential Subdivision, Lot 21 in DP714858, Hearnese Lake, Woolgoolga, July 2007

²⁴ Ibid. p19

this reticulated water supply. The reticulated water supply in the subdivision shall include the provision of a ring main with Hydrants installed in accordance with the specifications of Australian Standard A.S 2419.2 and have a minimum flow rate of 10 litres /second. 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. A clear unobstructed path between the hydrant and the most distant point of the building cannot exceed 90 metres. Hydrant locations shall be delineated by blue markers placed on the hydrant side of the centreline of the road pavement.

- The Torrens Title subdivision of the land within Lot 21 in DP 714858 will create new lots which will have vehicular access directly off perimeter and internal roads which will be constructed to the deemed-to-satisfy specifications for Public Roads as defined by Chapter 4 of *Planning for Bushfire Protection 2006*. The new roads shall have a minimum 8.0 metre seal width to Road 1 & 2 and 6.5 metre seal width to the eastern end of Road 2 and to Road 3.
- The subdivision plan provides for the construction of a perimeter fire trail to the eastern aspect of Lots 29, 32, 39 – 43, extending north from the Road 2 cul-de-sac, turning to run along the northern boundary to link with the Road 3 cul-de-sac. This trail forms the eastern edge of the Asset Protection Zone to these lots and provides access to the bushfire hazard interface.
- A further fire trail is provided extending to the south off the Road 2 cul-de-sac and linking to the existing access track that extends along the southern boundary of the site, within the eastern unmade section of Hearn's Lake Road. This trail provides access to the bushfire hazard interface along the southern aspect of the subdivision.
- The specifications for the proposed fire trails within a development are:
 - *A minimum carriageway width of 4.0 metres with an additional 1.0 metre clearance provided to each side which is kept clear of grasses and shrubs;*

- *Passing bays shall be provided at approximately 200 metre intervals on fire trails. Passing bays shall be 20 metres long and 3 metres wide, clear of the road formation;*
 - *The carrying capacity of the fire trail surface shall be 15 tonnes for reticulated areas;*
 - *Curves shall have an inner radius of 6 metres and an outer radius of 12 metres;*
 - *Maximum grades shall be 15 degrees (10 degrees preferred);*
 - *A minimum vertical distance of 4.0 metres shall be provided clear of overhanging branches, trees and shrubs.*
- The subdivision layout provides emergency response access/egress in the form of a looped road from Hearn's Lake Road and cul-de-sac turning heads to the short dead-ends. The perimeter fire trails provide access to the Littoral Rainforest vegetation to the eastern and southern aspects of the subdivision and adequately address fire fighting access to the subdivision, given the low fire risk from the Littoral Rainforest vegetation to these aspects.
 - The intention of bushfire hazard management is to prevent flame contact with a structure, reduce radiant heat to below the ignition thresholds for various elements of a building, to minimize the potential for wind driven embers to cause ignition and to reduce the effects of smoke on residents and fire-fighters. Careful attention shall be given to species selection of landscaping within the lots, their location relative to their flammability, avoidance of continuity of vegetation [separation horizontally and vertically] and ongoing maintenance to remove flammable fuels. Methods of bushfire hazard management include mowing of lawns and manual removal of combustible material, particularly within the landscaped areas.
 - It is recommended that a Section 88B Instrument, under the provisions of the Conveyancing Act of 1919, shall be created on the title of the lots within the development to ensure ongoing management of the nominated Asset Protection Zone and the combustible fuels within the landscaped gardens.

The level of Bushfire Protection proposed within the application is considered to satisfactorily address this matter.

5.7.5 Geotechnical

The report notes that the site is generally suitable for residential type development from a geotech point of view. The substrata are typically silty clay at a relatively shallow depth on the higher ground. The clays are moderately reactive and warrant a general site classification of M.

The site is considered to be satisfactory for residential development from a geotechnical point of view.

5.7.6 Flooding

Local flooding has been considered by Patterson Britton & Partners²⁵ and Gilbert and Sutherland²⁶ for the subject site and for the Hearnese Lake ICOLL specifically.

A detailed flood study for Hearnese Lake has been undertaken by Worley Parsons in relation to the Sandy Beach North development. This report concludes that the 100 year ARI flood level is 2.6AHD and that the 100 year design recurrence taking account of climate change is 2.95AHD.²⁷ A further report has been prepared by de Groot and Benson assessing the proposal against this most recent flood study. The report concludes that the subject development would not be affected by flooding concerns because it is located well above the 100 year ARI flood level. The subject site has a residential low point at RL4.5 rising to RL20.0. This is well above the Hearnese Lake 2.95AHD.²⁸

It is not considered that flooding is a matter for concern relating to the subject site.

²⁵ Patterson Britton and Partners Pty Ltd 45 Hearnese Lake Road, Coastal Hazard Definition and Lake Entrance Processes 2004

²⁶ Gilbert and Sutherland Pty Ltd Stormwater Management Plan for Proposed Hearnese Lake Road Development Coffs Harbour 2004

²⁷ Worley Parsons; Sandy Beach North Residential Development, Flood Impact Assessment, February 2009 p26

²⁸ De Groot and Benson Pty Ltd, Flooding Assessment for Lot 21 Hearnese Lake Road, Woolgoolga, April 2009

5.8 Water Cycle Management

A report has been prepared by BMT WMB dealing with the Hydrologic and Stormwater quality investigations undertaken for the proposed residential subdivision.²⁹ The report notes that the stormwater quality management strategy incorporated in the proposal follows the requirements of the Hearnese Lake/Sandy Beach DCP – Appendix A.

The strategy incorporates treatment measures in series to capture, convey and/or filter stormwater prior to discharge into the receiving waters. The stormwater quality management measures include filter strips, vegetated swales, a combined bioretention/detention basin, rain gardens and rain water tanks to manage common stormwater pollutant loads.³⁰

The proposed stormwater quality management strategy was also configured and sized conceptually using MUSIC software and compare against the “modified source” and conveyance control treatment strategy”. The measures are considered to not only meet the standards set in the Hearnese Lake/Sandy Beach DCP – Appendix A but to achieve a level of treatment that exceeds current best practice.³¹

The proposed stormwater quantity management elements including roof gutters, property roof drainage lines, interallotment drainage lines, kerb and gutter, vegetated swales, roads and pipes would be appropriate for conveyance of peak developed flows for the 10 and 100 year ARI design events. A detention basin is proposed within the south-western corner of the site to achieve the DCP objective that requires development to have no adverse change to flood behaviour for adjacent properties or elsewhere in the catchment. It is considered that the proposed detention basin would achieve the Hearnese Lake/Sandy Beach DCP objectives.³²

The Hearnese Lake/Sandy Beach DCP indicates that a 50m buffer should be provided between a proposed development and a SEPP 26 Littoral Rainforest boundary for the protection of water quality. The subject site would be separated from the development by an ephemeral wetland that intermittently captures and stores runoff prior to infiltration/evaporation. The ephemeral wetland would therefore intercept runoff from the

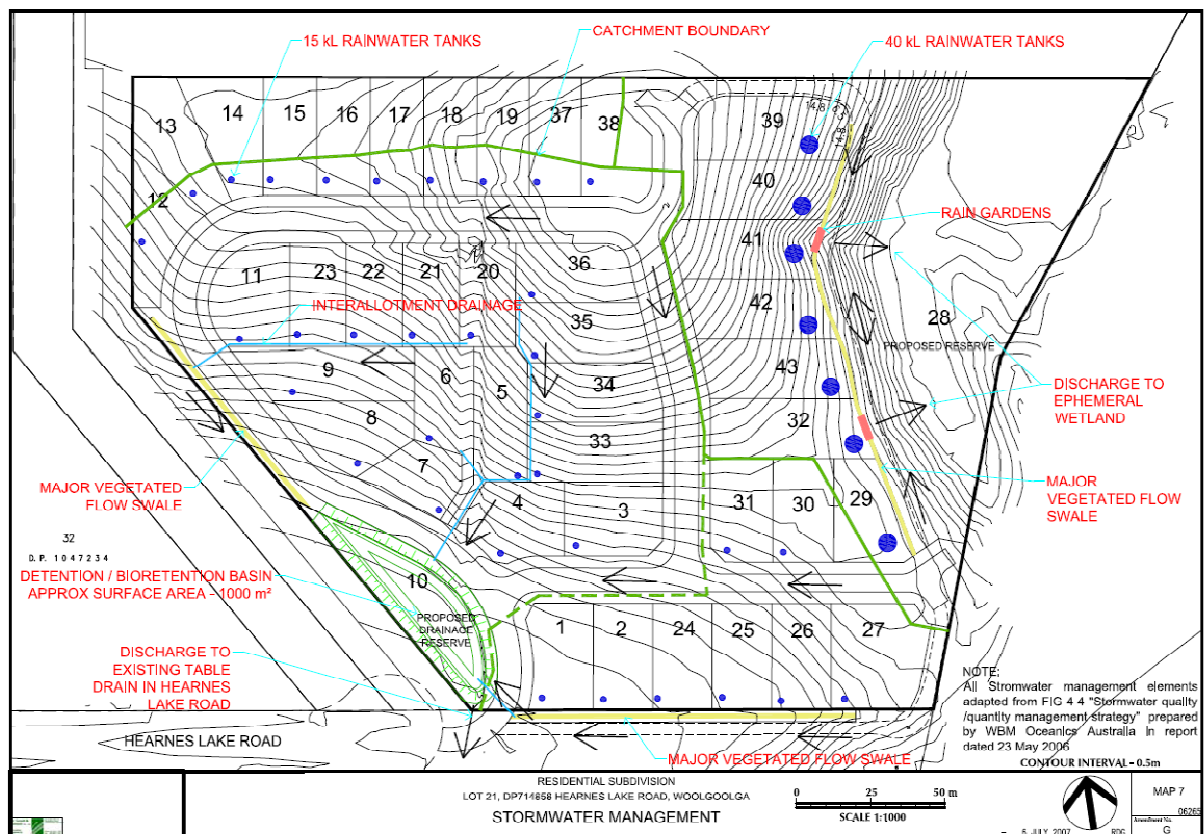
²⁹ BMT WMB, Revised Stormwater Management Strategy, 45 Hearnese Lake Road, Woolgoolga, July 2008.

³⁰ Ibid. p1

³¹ Ibid. p1

³² Ibid. p2

development site preventing it from flowing into the SEPP 26 Littoral Rainforest. To minimise the potential for elevated loads of stormwater pollutants to be conveyed to the ephemeral wetland, a series of rainwater tanks, vegetated swales and rain gardens are proposed along the rear of Lots 1 – 10. It is considered that the proposed measures in this area would effectively perform the role of water quality buffer for the ephemeral wetland.



The report makes the following recommendations:

- Rainwater tanks shall be provided for all residential lots and have minimum capacity of 15kL.
- Rainwater tanks shall only capture roof water and a minimum of 50% of the roof area shall drain to the tank.
- A 1m wide vegetated filter strip shall be provided behind the kerb and gutter along each road within the development where vegetated swales are unable to be provided.

- The combined surface area of the vegetated swales shall be 1140m².
- The proposed width of vegetated swales within the development shall be 3m.
- The minimum surface area of the bioretention swales/basin shall be 455m².
- The minimum pond volume of 700m³ shall be provided in rainwater tanks.

It is considered that the proposal meets the requirements of the Hearn's Lake/Sandy Beach DCP – Appendix A and exceeds best practice.

5.9 Heritage

A report has been prepared by Jacqueline Collins dealing with Aboriginal Cultural Heritage for the site.³³ The site does not contain any listed European Heritage Items nor has a survey of the site shown any matters of significance in terms of European Heritage.

Under the auspices of Part 3A, authorisations for an approved project, including permits and consents under Section 87 and Section 90 (Part 6) of the *National Parks and Wildlife Act 1974*, are not required for development-related works that may impact on Aboriginal cultural heritage. However, the NSW Department of Planning will take account of heritage issues and consult with the Department of Environment and Climate Change (DECC) to ensure that any such issues are duly considered prior to granting project approval. In the absence of the requirement for Section 87 permits and Section 90 consents, the proponent will be required to manage Aboriginal heritage issues in accordance with the specific conditions of approval imposed by the Minister for Planning.

A field survey that included Lot 21 was conducted with Coffs Harbour and District Local Aboriginal Land Council (CHLALC) and Yarrawarra Aboriginal Corporation representatives in 2004 to assist preparation of Coffs Harbour City Council's *Hearnes Lake/Sandy Beach Development Control Plan*. At that time, the Garby Elders were additionally involved in a field reconnaissance inspection north of Hearnes Lake and were consulted regarding the locations of sites of cultural/social significance. The outcomes and recommendations of the 2004 assessment were and are still supported by the CHLALC and the Yarrawarra Aboriginal Corporation/Garby Elders and remain unchanged.

The specific objectives of the current cultural heritage assessment were to-

- Consult with Aboriginal Stakeholders identified in accordance with the DECC (2004) *Interim Community Consultation Requirements for Applicants* to document any concerns they may have regarding the development proposal.

³³Jacqueline Collins Consultant Archaeologist, Lot 21 DP 714858 Hearnes Lake Road, Woolgoolga- Aboriginal Cultural Heritage Assessment, December 2007

- Conduct a desktop assessment to identify areas of known and potential Aboriginal cultural and/or archaeological significance in and near Lot 21.
- Undertake an inspection of Lot 21 with any registered Aboriginal Stakeholders who required further field assessment.
- Identify any previously unrecorded sites/places of cultural significance that may be affected by the proposed development.
- Assess the nature and extent of the potential impacts of the proposal on Aboriginal cultural heritage values and resources.
- Provide management recommendations, developed in consultation with Aboriginal Stakeholders, to avoid and/or or mitigate development impacts.

At the time of first European settlement the Hearn's Lake area was occupied by Gumbaingirr speaking people whose traditional territory extended over a wide area from the Clarence River to at least as far south as the Nambucca. The Gumbaingirr comprised several distinct but interrelated groupings of people, each associated with a separate geographical area. Historical accounts place the Jita Jita group between Moonee and Woolgoolga, with lands stretching inland to the Orara River. Gumbaingirr groups shared economic resources, trading and ceremonial occasions, intermarried, and spoke a mutually intelligible language, even though differences of dialect or speech and some cultural practices varied from one group or locality to another.

During the course of everyday life, resource exploitation was reportedly undertaken by family groups and often several families would co-operate to form a highly flexible 'band' that would gather and then disperse as conditions demanded. In early contact times most of the Aboriginal population seems to have inhabited the coastal plain and major river corridors. The largest camps are said to have been situated at Bagawa on the Orara River, but substantial coastal camps remained at Woolgoolga to the study area's north and south respectively.

Aboriginal landuse patterns were substantially modified in the decades following European settlement, as traditional territories were alienated and freedom to move through the country was progressively restricted. Despite

these obstacles, many local Gumbaingirr were able to maintain traditional knowledge of, and associations with their country, and still collect and use a variety of bush tucker, bush medicines and other forest products.

Individuals and small family groups continued to occupy bush camps well into the 20th century, with many of the remembered camps dating to the 1940s, 50s and 60s. Both these camps and a range of other types of historic Aboriginal sites have been researched and indicatively mapped. An analysis of historic camp locations revealed the majority to have been situated on crown land within 1-2 kilometres of the coast, near a supply of fresh water. A significant proportion of these camps were established either at a place of work, or in walking distance of work, but others were used seasonally for recreation purposes, or in response to the availability of certain resources.

Two former 20th century camping places occur in the Hearn's Lake locality, one within the lakeside reserve just south of Hearn's Lake Road, and the other further south near Sandy Beach. The 2004 consultation revealed two places of traditional and on-going spiritual significance. The first of these (since registered as DECC site #22-1-232) is a natural mythological site centred on Flat Top Point, which runs inland to encompass the freshwater lagoon that extends into the north eastern corner of Lot 21. Myths connected with this site are secret/sacred and thus not available for public dissemination. The lagoon and its associated wetland and banks would be rehabilitated and preserved as an area of Environmental, Habitat and Catchment Protection (proposed Lot 28). To identify whether the proposed residential development would adversely affect the cultural and spiritual values of site #22-1-232, consultation was undertaken with the site informant (Tony Perkins) during the present assessment. Tony Perkins advised that these values would not be compromised providing the lagoon and its surrounds are spared any direct or indirect development disturbance, and supported plans for its protection and rehabilitation.

The second site of spiritual significance (site #22-1-233) comprises two small alluvial islands near the confluence of Double Crossing Creek and Hearn's Lake, 450 metres south of Lot 21. These islands, which are central to the ceremonial increase of animal 'totems' belonging to specific Aboriginal families, would not be affected by the proposed development.

Parts of Hearn's Lake have more recent historic, resource-use and emotional attachments. For a period of some 15 years during the 1950s and 1960s, the late Michael McDougall lived with relatives in a tent on the northern bank of the lake, approximately 50 metres south of the study area. This campsite was initially recorded and its exact location pinpointed by Michael McDougall during the 2004 reconnaissance. The camp residents primarily subsisted on marine and estuarine foods, and walked along the beach to sell fish in Woolgoolga.

To further assess cultural heritage values and determine whether any previously unidentified sites/places of significance would be affected by the subdivision proposal, consultation was undertaken with the registered Aboriginal Stakeholders, including a field reconnaissance with Mudjay Elders Steven Hart and Terry Carberry on the 7th of November 2007. Apart from the lagoon within proposed Lot 28, no significant sites/places or attachments were reported in the study area itself. Steven Hart and Terry Carberry advised that their primary concern with respect to the proposed development lies in its potential to adversely affect Hearn's Lake and its resources. These Stakeholders regard Hearn's Lake to be part of their 'Dreaming'. The foredune beyond the study area's south-eastern corner was also assessed to have a high level of potential cultural sensitivity. However, the subject section of dune is covered by an existing bungalow and its associated yard and would be neither directly nor indirectly affected by development of Lot 21.

A field survey and assessment of an area that included Lot 21 was undertaken by the consultant with the assistance and input of CHLALC and Yarrawarra Aboriginal Corporation/Garby Elders representatives in 2004. These Stakeholders advised that further field survey of Lot 21 was not warranted or required, and that they endorsed the 2004 recommendation for subsurface investigation of the level terminal end of the Lot 21 ridge crest.

Given that they were not involved in the 2004 field survey or assessment, a general field inspection of Lot 21 was conducted with Mudjay Elders Stakeholders Steven Hart and Terry Carberry on the 7th of November 2007. As a result of this inspection, Steven Hart and Terry Carberry concluded that Lot 21 would be unlikely to contain significant archaeological sites owing to the close proximity of sensitive dune landforms. The inspection undertaken with the Mudjay Elders confirmed that exposure and visibility conditions have not improved since 2004, and that any further detailed survey of Lot 21

would be similarly unproductive and arrive at the same conclusions and management recommendations as previously reached. An identified natural mythological site (#22-1-232) extends into the north-eastern corner of Lot 21. This area comprises a back-barrier lagoon, which along with its surrounding wetlands and banks, would be rehabilitated and preserved as an area of Environmental, Habitat and Catchment Protection (proposed Lot 28) within the residential subdivision context. Aboriginal Stakeholder advice indicates that the significant values attached to this site would not be compromised providing proposed Lot 28 is spared any direct or indirect development disturbance or contamination.

With the possible exception of the lagoon/wetland to be preserved within proposed Lot 28, the study area has been cleared of its original vegetation and no longer offers flora or fauna of Aboriginal resource use value. However, Hearn's Lake to the south has been associated with historical camping and the on-going use of wild resources, and is held to be a significant landscape feature in its own right. Preservation of the cultural heritage values of Hearn's Lake will be contingent upon the minimisation or avoidance of pollution effects associated with the Lot 21 development. The site #22-1-234 artefact scatter recorded on a ridge crest 500 metres north-west of Lot 21 is considered likely to be associated with transit activities. The existence of this site raises the possibility that additional undetected artefact scatters could occur along other reasonably level and intact sections of the same ridgeline. This ridgeline extends through Lot 21 and terminates near the southern bank of the lagoon/wetland, which forms part of a registered natural mythological site (#22-1-232).

Owing to the gradient of most of the ridgeline and European modifications that have occurred, only the level terminal end (which has been cleared and supports grass cover and some small regrowth trees) is considered to have any substantial archaeological potential. This potential was recognised in 2004, when it was recommended that the subject section of crest be further investigated to determine its archaeological status. Given the erosional soil conditions, it was suggested that this investigation could be effectively achieved by 'scraping off' the grass cover with a suitable machine to reveal the ground surface and facilitate a more thorough inspection. This was undertaken in 2009 and yielded very little in the way of material.³⁴

³⁴ Jacqueline Collins Consultant Archaeologist, Lot 21 DP 714858 Hearn's Lake Road, Woolgoolga-Archaeological Test Excavations, March 2009

The report makes the following recommendations:

- To preserve the cultural and spiritual values and attachments of the site #22-1-232 natural mythological site, proposed Lot 28 should be spared any development-related disturbance, and protected and rehabilitated as proposed. To achieve an appropriate level of protection, consideration should be given to the fencing and signposting of this allotment to minimise access and associated degradation by adjoining residents.
- It is recommended that development of the Lot 21 ridge be allowed to proceed without further Aboriginal cultural heritage constraints.
- In line with Aboriginal stakeholder wishes, all cultural materials recovered during the test excavations described in this report should be re-located (by the stakeholders) to the proposed Lot 28 Environmental, Habitat and Catchment Protection area once any required rehabilitation works are complete. Details of the redeposition location should be supplied to the Department of Environment and Climate Change (DECC) for its records.
- Due to its perceived low level of cultural heritage value and archaeological potential, no further investigation or assessment is required within the proposed residential development area off the potentially sensitive section of ridge crest.
- To preserve the Aboriginal cultural/social values of Hearn's Lake, best-practice methods of containing sediment and other pollutant run-off should be implemented during the construction stage and maintained and over the long term.
- In the event that any Aboriginal cultural materials are discovered or exposed during any stage of the proposed development works, all works must immediately cease in the vicinity of the find. The DECC Northern Aboriginal Heritage Unit (Coffs Harbour) and the Aboriginal Stakeholder groups should then be contacted for management advice and clearance given by these organisations before work resumes in the subject locality. In the unlikely event that possible or identified Aboriginal skeletal remains are discovered or exposed, the NSW Police Department should also be contacted in addition to the above organisations.

It is considered that the proposal appropriately addresses the Aboriginal and European Cultural Heritage of the site.

5.10 Flora and Fauna

A Flora and Fauna report has been prepared for the development by Eco Logical Australia dated July 2007.³⁵

Previous flora and fauna surveys had been undertaken on the subject site (James Warren & Associates 2003 (JWA); Bushfire safe Australia 2006). The JWA survey assessed flora and vegetation of the subject site in June 2003, and undertook an assessment of threatened fauna habitat values based upon that fieldwork, but no systematic survey for fauna species was undertaken. The Bushfire safe Australia (2006) survey carried out fieldwork in order to review the vegetation and flora data of the JWA report, and also undertook some systematic fauna survey methods (spotlighting, call playback, stag-watching, ultrasonic bat detection) on 24th February, 5th April and 1st June 2006. A review of these previous reports was undertaken by staff of Coffs Harbour City Council (CHCC), who concluded that the season in which flora and fauna survey had been undertaken was inappropriate for detecting the threatened flora and fauna likely to occupy or utilise the subject site. Therefore, further survey work was required to be carried out during spring, the season considered most appropriate for the detection of target species. ELA is also required to consider the potential impacts in accordance with local environmental planning instruments, namely the CHCC Comprehensive Koala Plan of Management and the CHCC Tree Preservation Order. Where potential impacts upon any threatened species are identified, ameliorative measures are to be proposed.

The proposed residential subdivision includes a number of features and measures that are designed to retain and protect, or minimise potential impacts upon, the ecological values present within and adjacent to the subject site. These include:

- protection and buffering of the freshwater wetland and adjacent vegetated slope on the eastern side of the subject site;
- protection and buffering of the regenerating areas of wetland and littoral rainforest on the subject site;
- buffering of the adjacent SEPP 26 Littoral Rainforest community;

³⁵ Eco Logical Australia, Flora & Fauna Assessment, Lot 21 DP 714858 45 Hearn's Lake Rd, Woolgoolga July 2007

- adoption of a 50 metre horizontal buffer on the 3.5m above high water datum (AHD) vertical contour of Hearn's Lake in order to protect the values of the lake and fringing vegetation;
- installation of a stormwater management system designed to manage and minimise the ingress of potential stormwater-borne pollutants into both the freshwater wetland and Hearn's Lake;
- the maintenance, possibly through a covenant on property titles, of a native grassland character, dominated by Kangaroo Grass *Themeda australis*, in the yards of selected properties. This grassland community will be maintained through long mowing/slashing timed to maximise effective control of non-native grasses;
- the retention, where possible, of native trees on the subject site, and the use of local-provenance seed in replanting appropriate areas with Kangaroo Grass, Forest Red Gum, Broad-leaved Paperbark, Swamp Box and Swamp Oak.

The data search for TSC Act and EPBC Act threatened species, populations and communities produced a total of 52 threatened fauna species and 16 threatened plant species known to occur, or considered likely to occur, in the study area (note that fish, sea birds, marine mammals and marine reptiles were excluded from this search). These species are listed, with those considered likely or potentially to occur on, or utilise, the subject site (based on field-based habitat assessment), highlighted in bold.

Flora and Vegetation Survey

A total of 124 plant species was recorded during a traverse of the subject site. In comparison, JWA (2003) recorded 81 species. Of these, 32 (26%) were introduced species, the majority of which were recorded in Areas 1 and 2. A list of plant species recorded on the subject site, and the assessment area in which they were recorded, is provided. Note that it is likely that not all plant species present on the subject site were recorded, although the likelihood is low considering that some level of flora survey has now been carried out on the subject site across all seasons.



The subject site is considered to contain potential habitat for seven threatened plant species as listed in bold in Appendix 1. A thorough search of the subject site located one threatened plant species, Austral Toadflax *Thesium australe*. A subsequent detailed search for Austral Toadflax on the subject site revealed approximately 700 plants in eight discrete patches in the south-eastern sector of the site.

Six vegetation communities were identified on the subject site. These communities, their extent, and conservation status are discussed below. Vegetation assessment for this report generally concurred with that reported by JWA (2003).

Broad-leaved Paperbark Forest

Area: 0.11 ha.

Description: A small area of swamp forest dominated by Broad-leaved Paperbark *Melaleuca quinquenervia* occurs adjacent to a freshwater wetland in the swale of a consolidated beach hind-dune. Parts of the understorey of this community, and the adjoining wetland, are infested with the North American sedge *Cyperus prolifer*, a water plant popular as an ornamental, which has only recently been recorded as naturalised in NSW in several localities (PlantNET 2007). This species has the potential to become a serious environmental weed that has the ability to suppress or replace indigenous wetland vegetation. Measures to control its spread should be undertaken as a matter of some urgency.

Conservation Status: Listed under NSW TSC Act as an Endangered Ecological Community Habitat of the Wallum Froglet.

Coastal Banksia / Pink Bloodwood / Swamp Oak low woodland

Area: 0.35 ha.

Description: A regenerating community on an east-facing slope adjacent to the western edge of the freshwater wetland. Dominant species are Coastal Banksia *Banksia integrifolia* ssp. *integrifolia*, Swamp Oak *Casuarina glauca*, Pink Bloodwood *Corymbia intermedia* and Forest Red Gum *Eucalyptus tereticornis*. The understorey contains a diversity of grassland and heath species. Weeds are generally few in number, and this community is considered to be in good condition.

Conservation Status: Not currently listed as an EEC. As a part of the north-east NSW forest assessments, NSW NPWS (1999a) listed the Banksia forest ecosystem as a broad community incorporating a number of coastal vegetation types dominated by species of banksia. The ecosystem was classified as a rare ecosystem that was considered to be severely depleted (c. 27% of pre-1750 extent remaining), highly inadequately reserved, and a priority for conservation on private lands. A recent refinement of the 1999 north-east NSW forest ecosystem classification (Eco Logical 2006) identified the 'coastal headland heaths of the North Coast' vegetation community, which better fits the banksia community on the subject site, as it recognises this community, which occurs on bedrock substrates, as distinct to the banksia-dominated types that grow on deep sands or sand sheets. This community was estimated to have about 70% of its pre-1750 extent remaining.

Freshwater Wetland

Area: 0.41 ha.

Description: A small, mostly ephemeral freshwater wetland, with a small central area which appears to be more or less permanently inundated. This wetland lies within the swale of a large consolidated hind-dune, at the contact zone of deep coastal sands and heavy clay-loams of the adjacent landward hillslope. Community dominants include the waterlilies *Nymphaea caerulea ssp. zanzibarensis* (a naturalised species) and *Nymphoides indica*, the sedges *Lepironia articulata*, *Eleocharis sphacelata*, and a significant infestation of the introduced *Cyperus prolifer*, and the grasses *Leersia hexandra* and *Zoysia macrantha*.

Conservation Status: Listed under NSW TSC Act as an Endangered Ecological Community. Habitat of the Wallum Froglet. Whilst not currently included in coastal wetland mapping under SEPP 14 Coastal Wetlands, this community qualifies as such.

Littoral Rainforest regeneration

Area: 0.02 ha.

Description: A small regenerating patch of Littoral Rainforest, adjacent to the intact Littoral Rainforest adjoining the eastern boundary of the subject site. Indicative species include Cheese Tree *Glochidion ferdinandi*, Lilly Pilly *Syzygium smithii*, Brush Cherry *S. australe* and Sandpaper Fig *Ficus coronata*.

Conservation Status: Listed under NSW TSC Act as an Endangered Ecological.

Forest Red Gum / Broad-leaved Paperbark / Swamp Oak / Swamp Box remnant forest

Area: 0.14 ha.

Description: A remnant forest community of low stature, comprising several small clumps of trees and a number of individual trees scattered mainly across the southern and eastern sections of the subject site. The dominant overstorey species is Forest Red Gum *Eucalyptus tereticornis*, with Broad-leaved Paperbark *Melaleuca quinquenervia*, Swamp Oak *Casuarina glauca* and Swamp Box *Lophostemon suaveolens* occupying the mid- to lower slopes of the site. The understorey has been modified through slashing and past grazing of livestock, and contains a number of weed species such as Broad-leaved Paspalum *Paspalum wettsteinii*, Carpet Grass *Axonopus compressus* and Dwarf Milkwort *Polygala japonica*, but it also supports a reasonable diversity of native species. There are approximately 30-40 mature overstorey trees of this community remaining on the subject site, along with a similar number of younger specimens. This community would once have occurred across most of the now-cleared parts of the subject site.

Conservation Status: Listed under NSW TSC Act as an Endangered Ecological. The overstorey and native groundcover species present in this community make it possible to assign parts of this remnant vegetation to either one of three EECs, depending upon whether Forest Red Gum, Broad-leaved Paperbark or Swamp Oak dominate. However, because Forest Red Gum currently dominates, and was probably the dominant overstorey species before the site was largely cleared, it is best to assign this community to the Sub-tropical Coastal Floodplain Forest of the NSW North Coast bioregion EEC.

Slashed Kangaroo Grass / Broad-leaved Paspalum / Pigeon Grass Grassland
Area: 4.37 ha.

Description: Covering over 80% of the subject site, this is a derived grassland community, created mainly through the removal of the overstorey of community, followed by management of the land as a grazing enterprise. Depending upon soil moisture levels, this community is variously dominated by Kangaroo Grass *Themeda australis*, Broad-leaved Paspalum *Paspalum wettsteinii* and South African Pigeon Grass *Setaria sphacelata*. Other common species include Carpet Grass *Axonopus compressus* and Pennywort *Centella asiatica*.

Conservation Status: This community is not considered to be of conservation significance as it is a derived community. However, it constitutes habitat for the threatened plant Austral Toadflax *Thesium australe*.

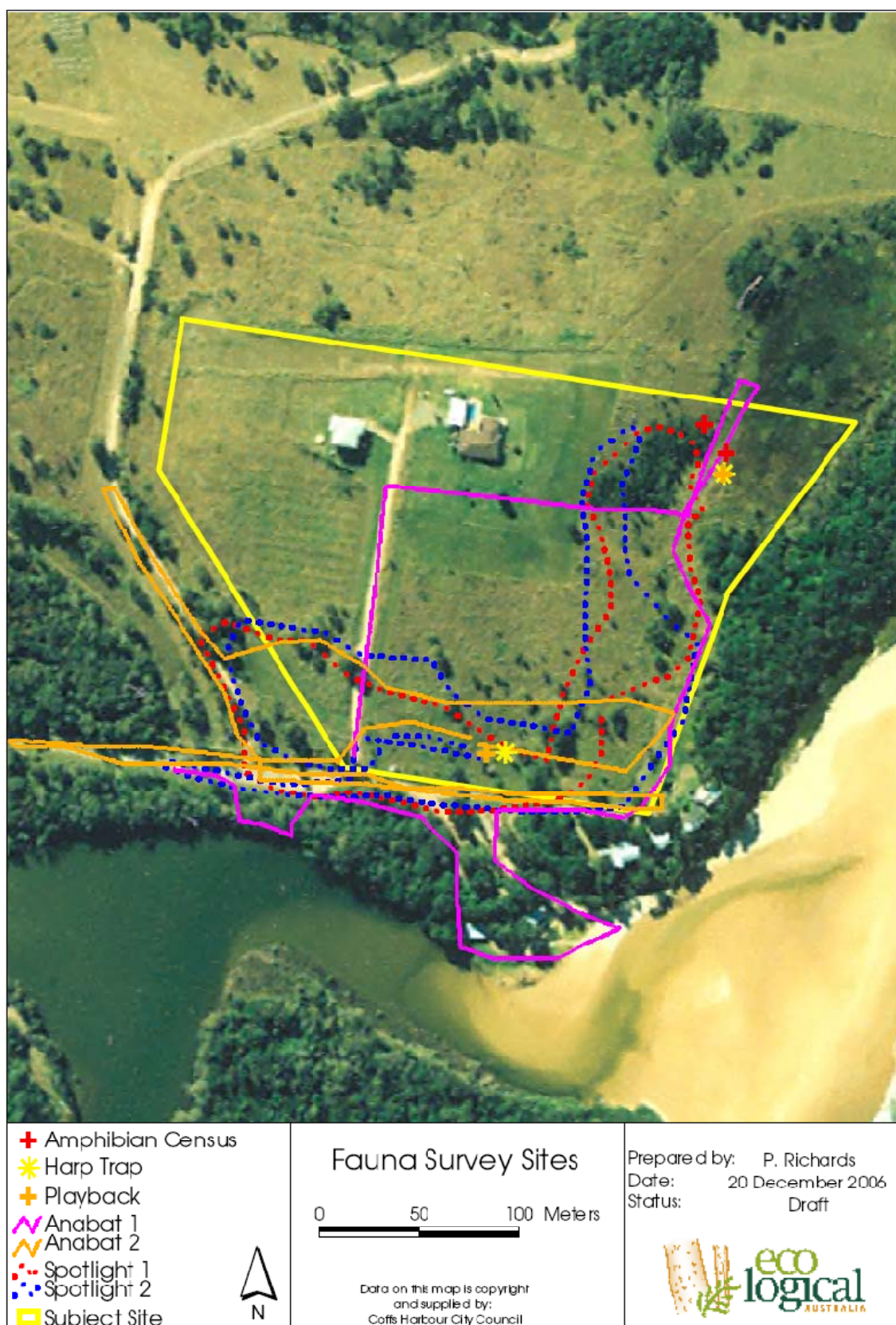
Endangered Ecological Communities

The following four Endangered Ecological Communities (EECs) were recorded on the subject site:

1. Swamp sclerophyll forest on coastal floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions (SSF EEC). This EEC is represented on the subject site by community 3.2.4.1 Broad-leaved Paperbark Forest.
2. Freshwater wetlands on coastal floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions. This EEC is represented on the subject site by Freshwater Wetland.
3. Littoral Rainforest in the NSW North Coast, Sydney Basin and South East Corner bioregions. This EEC is represented on the subject site by Littoral Rainforest Regeneration.
4. Sub-tropical Coastal Floodplain Forest of the NSW North Coast bioregion (SCFF EEC). This EEC is represented on the subject site by Forest Red Gum / Broad-leaved Paperbark / Swamp Oak / Swamp Box Remnant Forest.

Fauna Habitat

The subject site contains potential habitat for 26 threatened fauna species, as listed. The remnant vegetation communities may provide foraging and shelter habitat for some of the threatened species that are considered likely to occur there, but the subject site supports very few, if any, hollow-bearing trees. The site's value as roosting and breeding habitat for hollow-dependent species is, therefore, negligible. However, the site may provide seasonal foraging for mobile hollow-dependent species in the local area.



Note that, in spite of a total of eight trap nights effort, no bats were captured in the harp traps. This is probably due to the lack of distinct 'flyways' on the subject site, and the observation of a generally low level of bat activity,

even over the freshwater wetland. The little bat activity observed during the survey period occurred over the water body of Hearn's Lake. Traps were located on the subject site where the greatest chance of success was expected, but because of security concerns they could not be located outside the subject site. As mentioned previously, the subject site is considered to provide sub-optimal habitat for microchiropteran bats in general.

One threatened fauna species, Wallum Froglet *Crinia tinnula*, was recorded on the subject site. Approximately six individuals were heard calling in and adjacent to the freshwater wetland in the eastern sector of the subject site.

Examination of the trunks and the ground beneath the crowns of Koala food trees on the subject site failed to locate Koala scratches or scats. No koalas were recorded during fauna survey. Lunney *et al.* (1999) reports that koala records are concentrated in the south-east of Coffs Harbour Shire, with a significant drop-off in Koala numbers north from Korora on the coastal strip. It is therefore considered that the subject site constitutes very low quality Koala habitat, although it does support known Koala food trees.

The report concludes that a number of threatened species and communities were identified on the subject site. An assessment of the potential impact upon these species and communities of a proposed residential subdivision concluded that a number of ameliorative measures were required in order to meet ecological objectives for the site. These include:³⁶

- Secure environmental protection zoning on part of the site to protect known occurrences of, and potential habitat for, threatened flora and fauna and EECs.
- Consolidation and enhancement of native vegetation within the above environmental protection zone to ensure the persistence of a local, coastal vegetated corridor which links areas to the north and south of the site.
- Active, sympathetic management within environmental protection areas and suitable parts of the development footprint to assist in the regeneration of EECs and other native vegetation, and to maintain quality habitat for threatened flora.

³⁶ Ibid p34

- Possible use of local threatened plant seed for use in a population enhancement program within suitably managed parts of environmental protection zone.
- The maintenance of the Kangaroo Grass grassland habitat on designated parts of the site.
- Provision of environmental buffers to protect areas of conservation value from edge effects.
- Stormwater management designed to maintain groundwater conditions and local patterns of freshwater flow, and to ensure the quality of runoff water into high conservation value areas within and adjacent to the site.
- Exploring opportunities for neighbouring properties to adopt similar sympathetic management of areas to enhance EEC regeneration and also to provide extended habitat for threatened flora.

It is considered that these measures will ensure the protection, persistence and ongoing viability of those threatened species and communities known to occur within and adjacent to the subject site.

6.0 CONSULTATION

The community consultation process has proceeded, mostly informally, over the past 5 years. There was consultation in preparation of the original masterplan, consultation in the assessment period of the masterplan, consultation (led by CHCC) during the preparation and adoption of the DCP and other informal conversations since then.

During masterplan process in the eighteen months leading up to its refusal the applicant met or spoke with immediate neighbours Mylchrest, large landholder to west of the site, Davey, the owners of the caravan park, owners of no 1,3,5 & 9 Hearnese Lake Road and a number of residents of the caravan park. Additionally the applicant met with owners of land on the Southern shore of Hearnese Lake. The applicant also met with Sandy Hearnese Action Group (SHAG) including member Wayne Evans and toured the site with them.

During the DCP process the applicant attended the Council organized land holders meeting, met with the CHCC masterplan consultant and attended two public meetings held at Sandy Beach Primary School.

Other opportunities for public consultation were from submissions and feedback on the masterplan and the DCP.

Subsequently the applicant has met with or spoken to the neighbours not previously met including Wilson and Thompson. The applicant also met with Landcare representatives and attended tree planting organized meetings.

The applicant has discussed the development of the site with all level of CHCC and with Councillors. Some of these Councillors have toured the site with the applicant.

- 1.1 Coffs Harbour City Council
- 1.2 NSW Department of Environment and Climate Change
- 1.3 NSW Department of Water and Energy
- 1.4 NSW Department of Primary Industries
- 1.5 NSW Department of Lands
- 1.6 NSW Rural Fire Service
- 1.7 NSW Roads and Traffic Authority
- 1.8 Solitary Islands Marine Park Authority

1.9 Local Aboriginal Land Councils

1.10 Community Consultation

Consultation with local and state government authorities and agencies, along with the local community was undertaken during formulation of the proposal. Consultation is necessary in order to provide an avenue for participation in the environmental assessment process and to ensure that all potential impacts are considered and addressed.

The following section identifies relevant stakeholders and their role in the environmental assessment process, strategies undertaken in order to carry out the required consultation, issues raised by stakeholders and how those matters have been addressed in the environmental assessment.

Consultation Strategy

Consultation with the above authorities consisted of the provision of an information package including the Preliminary Assessment, draft Plan and summary of applicable information and issues.

When required, discussion and negotiation with relevant agencies was undertaken with respondents with regard to any comment or issues considered to be significance to the environmental assessment.

Consultation Outcomes

The outcomes of consultation undertaken with authorities and agencies is summarised in the following. On the whole, authorities and agencies did not provide detailed comment on the proposal as a result of the consultation process.

It is noted that a number of authorities and agencies had been previously consulted by the Department of Planning during the formulation of the Director General's Environmental Assessment Requirements. As a result of this consultation process, these authorities and agencies provided guidelines and assessment requirements which were then included into the Director Generals Requirements.

It should also be noted that all authorities and agencies will be provided with the opportunity to comment on the proposal, as part of the exhibition process that will be undertaken by the consent authority, following lodgement of the proposal.

Community Consultation

Public consultation programmes should be tailored to the specific details of a project including the following:

- the projects local and regional context;
- the type of development proposed;
- its proximity to the local community; and
- the degree of impact on environment and socio-economic aspects of the area in which it is proposed.

All of the above details were considered when formulating a public consultation strategy for a project.

Community Consultation Strategy

The aim of the community consultation strategy was to engage as widely as possible with all stakeholders, with the view of seeking advice and input on the proposal prior to finalisation. It was considered that the most effective way of achieving this was to hold a series of public presentations and public information sessions.

A public information sessions will be held during the exhibition period. The proponent will present details of the proposal including a thorough explanation of the site analysis process undertaken and details of the Project Application. Questions and feedback will be invited at all sessions in an attempt to further understand the opinions of the community in relation to the proposal.

7.0 DRAFT STATEMENT OF COMMITMENTS

The commitments listed in the following section have been compiled based on the environmental assessments undertaken in the preparation of this EA. They provide a commitment from the proponent, indicating responsibilities and timing, to implement measures to minimise the risk of potential environmental impacts that have been identified through this assessment and ensure that the project is environmentally, socially and economically sustainable.

The proponent is committed to maximising the environmental, social and economic benefits of this proposal and minimizing any potential negative impacts. The measures that the proponent will implement to achieve these objectives are outlined below.

General

The development will be carried out in accordance with the Environmental Assessment Report (EAR), prepared by Mersonn Pty Ltd, April 2009, supporting reports and drawings.

Infrastructure

The issues identified and recommended measures as detailed below will be implemented:

Water Supply

- Provide a 150mm water main link from the existing 225mm main located on the western side of the Pacific Highway. It will be necessary to underbore the highway to prevent disruption to traffic on the highway. *Responsibility: Proponent Timing: Prior to Subdivision Certificate*
- The 150mm main is to be extended along Hearnese Lake Road to the development site. *Responsibility: Proponent Timing: Prior to Subdivision Certificate*

- All internal subdivision pipework to be generally 100mm upvc.
Responsibility: Proponent Timing: Prior to Subdivision Certificate

Sewer

- The applicant proposes to forward fund that portion of the works connecting the site via Hearn's Lake Road and the Pacific Highway to the gravity sewer in Bosworth Road. The cost of these works will be recouped from contributions as this site and the surrounding identified future development areas are subdivided.
- Provide a permanent pumping station in the road reserve as close as possible to the location shown in the DCP. *Responsibility: Proponent Timing: Prior to Subdivision Certificate*
- Construct a 150mm gravity sewerage main from the site to the pumping station. The gravity main would be located in Hearn's Lake Road Reserve. *Responsibility: Proponent Timing: Prior to Subdivision Certificate*
- Internal sewage would be in accord with Council's Subdivision guidelines. *Responsibility: Proponent Timing: Prior to Subdivision Certificate*

Power and Telecomms

- The proposal includes amplification of the existing power and telecommunications services to provide for the proposed subdivision.
Responsibility: Proponent Timing: Prior to Subdivision Certificate

Traffic and Access

The issues identified and recommended measures as detailed below will be implemented:

- The bus turning circle at the end of Hearn's Lake Road will be constructed if the land is acquired by CHCC. *Responsibility: Proponent Timing: Prior to Subdivision Certificate*

- Access to the permissive tenancies will be maintained via the existing unmade section of Hearn's Lake Road and upgraded in accordance with the proposed fire trail requirements. *Responsibility: Proponent Timing: Prior to Subdivision Certificate*
- Access to the picnic area will be maintained from the bus turning circle. *Responsibility: Proponent Timing: Prior to Subdivision Certificate*

Hazard Management and Mitigation

The issues identified and the recommended mitigation measures to address these as detailed below will be implemented.

- Acid Sulphate Soils - Further testing for ASS will be required if the sewer pumping station is located in this position shown in the DCP. This is not required if the sewer pumping station is located within the Road Reserve. *Responsibility: Proponent Timing: Prior to Construction of sewer pumping station*

Bushfire Hazard

Asset Protection Zones as indicated in the EA report and on the relevant drawings will be instated. Aside from the instatement of asset protection zones, the following mitigation measures will be implemented:

- That the minimum construction to the future dwellings shall be Level 1 in accordance with the specifications of Australian Standard A.S 3959 -1999 "*Construction of Buildings in Bushfire Prone Areas*. *Responsibility: Housing Developers Timing: On Construction of Houses*.
- The future residential subdivision of the land will have a reticulated water supply connected to the Coffs Harbour Council mains. The dwellings in the future subdivision of the land will be connected to this reticulated water supply. The reticulated water supply in the subdivision shall include the provision of a ring main with Hydrants installed in accordance with the specifications of Australian Standard A.S 2419.2 and have a minimum flow rate of 10 litres /second. 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. A clear unobstructed path between the hydrant and the most distant point of the building cannot exceed 90 metres. Hydrant locations shall be delineated by blue markers placed on the hydrant side of the centreline of the road pavement.

Responsibility: Proponent Timing: Prior to Subdivision Certificate

- The Torrens Title subdivision of the land within Lot 21 in DP 714858 will create new lots which will have vehicular access directly off perimeter and internal roads which will be constructed to the deemed-to-satisfy specifications for Public Roads as defined by Chapter 4 of *Planning for Bushfire Protection 2006*. The new roads shall have a minimum 8.0 metre seal width to Road 1 & 2 and 6.5 metre seal width to the eastern end of Road 2 and to Road 3. *Responsibility: Proponent Timing: Prior to Subdivision Certificate*

- The subdivision plan provides for the construction of a perimeter fire trail to the eastern aspect of Lots 29, 32, 39 – 43, extending north from the Road 2 cul-de-sac, turning to run along the northern boundary to link with the Road 3 cul-de-sac. This trail forms the eastern edge of the Asset Protection Zone to these lots and provides access to the bushfire hazard interface. *Responsibility: Proponent Timing: Prior to Subdivision Certificate*

- A further fire trail is provided extending to the south off the Road 2 cul-de-sac and linking to the existing access track that extends along the southern boundary of the site, within the eastern unmade section of Hearn's Lake Road. This trail provides access to the bushfire hazard interface along the southern aspect of the subdivision. *Responsibility: Proponent Timing: Prior to Subdivision Certificate*

- The specifications for the proposed fire trails within a development are:

- *A minimum carriageway width of 4.0 metres with an additional 1.0 metre clearance provided to each side which is kept clear of grasses and shrubs;*
 - *Passing bays shall be provided at approximately 200 metre intervals on fire trails. Passing bays shall be 20 metres long and 3 metres wide, clear of the road formation;*
 - *The carrying capacity of the fire trail surface shall be 15 tonnes for reticulated areas;*
 - *Curves shall have an inner radius of 6 metres and an outer radius of 12 metres;*
 - *Maximum grades shall be 15 degrees (10 degrees preferred);*
 - *A minimum vertical distance of 4.0 metres shall be provided clear of overhanging branches, trees and shrubs.*
-
- The intention of bushfire hazard management is to prevent flame contact with a structure, reduce radiant heat to below the ignition thresholds for various elements of a building, to minimize the potential for wind driven embers to cause ignition and to reduce the effects of smoke on residents and fire-fighters. Careful attention shall be given to species selection of landscaping within the lots, their location relative to their flammability, avoidance of continuity of vegetation [separation horizontally and vertically] and ongoing maintenance to remove flammable fuels. Methods of bushfire hazard management include mowing of lawns and manual removal of combustible material, particularly within the landscaped areas.
Responsibility: Housing Developer Timing: Construction of Housing and On-going
-
- A Section 88B Instrument, under the provisions of the Conveyancing Act of 1919, shall be created on the title of the lots within the development to ensure ongoing management of the nominated Asset Protection Zone and the combustible fuels within the landscaped gardens. *Responsibility: Proponent Timing: Prior to Subdivision Certificate*

Hydrology and sediment control

Measures to maintain local and on-site water quality and provide protection from flood in the following table will be implemented.

- Rainwater tanks shall be provided for all residential lots and have minimum capacity of 15kL with Lots 29, 32, 39, 40, 41, 42 and 43 being provided with rainwater tanks with a minimum capacity of 40kL. *Housing Developers Timing: On Construction of Houses.*
- Rainwater tanks shall only capture roof water and a minimum of 50% of the roof area shall drain to the tank. *Housing Developers Timing: On Construction of Houses.*
- A 1m wide vegetated filter strip shall be provided behind the kerb and gutter along each road within the development where vegetated swales are unable to be provided. *Responsibility: Proponent Timing: Prior to Subdivision Certificate*
- The combined surface area of the vegetated swales shall be 1140m². *Responsibility: Proponent Timing: Prior to Subdivision Certificate*
- The proposed width of vegetated swales within the development shall be 3m. *Responsibility: Proponent Timing: Prior to Subdivision Certificate*
- The minimum surface area of the bioretention swales/basin shall be 455m². *Responsibility: Proponent Timing: Prior to Subdivision Certificate*
- The minimum pond volume of 700m³ shall be provided in rainwater tanks. *Responsibility: Housing Developers Timing: On Construction of Houses.*

Aboriginal heritage

The following management strategies will be implemented to address conservation of Aboriginal heritage values identified on the site:

- Proposed Lot 28 shall be spared any development-related disturbance, and protected and rehabilitated as proposed. *Housing Developer Timing: Construction of Housing and On-going*
- Proposed Lot 28 shall be fenced and signposted to minimise access and associated degradation by adjoining residents. *Responsibility: Proponent Timing: Prior to Subdivision Certificate*
- In line with Aboriginal stakeholder wishes, all cultural materials recovered during the test excavations described in this report should be re-located (by the stakeholders) to the proposed Lot 28 Environmental, Habitat and Catchment Protection area once any required rehabilitation works are complete. Details of the redeposition location should be supplied to the Department of Environment and Climate Change (DECC) for its records. *Responsibility: Housing Developer Timing: Construction of Housing and On-going*
- To preserve the Aboriginal cultural/social values of Hearn's Lake, best-practice methods of containing sediment and other pollutant run-off shall be implemented during the construction stage and maintained and over the long term. *Responsibility: Housing Developer Timing: Construction of Housing and On-going*
- In the event that any Aboriginal cultural materials are discovered or exposed during any stage of the proposed development works, all works shall immediately cease in the vicinity of the find. The DECC Northern Aboriginal Heritage Unit (Coffs Harbour) and the Aboriginal Stakeholder groups shall then be contacted for management advice and clearance given by these organisations before work resumes in the subject locality. In the unlikely event that possible or identified Aboriginal skeletal remains are discovered or exposed, the NSW Police Department shall also be contacted in addition to the above organisations. *Responsibility: Housing Developer Timing: Construction of Housing and On-going*

Ecology

Measures described in the EA to protect Flora of Conservation Significance, Fauna of Conservation Significance and Endangered Ecological

Communities within the boundaries of the site will be implemented during and consequent to the development of the proposal.

- Secure environmental protection zoning on part of the site to protect known occurrences of, and potential habitat for, threatened flora and fauna and EECs. *Responsibility: CHCC Timing: On Approval*
- Consolidation and enhancement of native vegetation within the above environmental protection zone to ensure the persistence of a local, coastal vegetated corridor which links areas to the north and south of the site. *Responsibility: Proponent Timing: Prior to Subdivision Certificate*
- Active, sympathetic management within environmental protection areas and suitable parts of the development footprint to assist in the regeneration of EECs and other native vegetation, and to maintain quality habitat for threatened flora. *Responsibility: Proponent Timing: Ongoing*
- Possible use of local threatened plant seed for use in a population enhancement program within suitably managed parts of environmental protection zone. *Responsibility: Proponent Timing: Ongoing*
- The maintenance of the Kangaroo Grass grassland habitat on designated parts of the site. *Responsibility: Proponent Timing: Ongoing*
- Provision of environmental buffers to protect areas of conservation value from edge effects. *Responsibility: Proponent Timing: Ongoing*
- Stormwater management designed to maintain groundwater conditions and local patterns of freshwater flow, and to ensure the quality of runoff water into high conservation value areas within and adjacent to the site. *Responsibility: Proponent Timing: Prior to Subdivision Certificate*
- Exploring opportunities for neighbouring properties to adopt similar sympathetic management of areas to enhance EEC

regeneration and also to provide extended habitat for threatened flora. *Responsibility: CHCC Timing: On Approval*

8.0 CONCLUSION

The proposed development is not designated development but in accordance with the provisions of the Environmental Planning and Assessment Act 1979 the proposed development is classified as Part 3A development. Consequently, the Minister is the consent authority for this project. This application responds to the Environmental Requirements issued by the Director-General for this project. The proposal is considered to be consistent with the aims and objectives and the provisions of CHLEP the Hearn's Lake/Sandy Beach DCP and the objectives and provisions of the relevant instruments, policies and codes.

The proposed works are considered to appropriately respond to the site constraints and the planning policies at Federal, State and Local Government level guiding the responses to those constraints. The proposed development will have no significant adverse impact upon the micro-climate, air or water quality, noise regime, or general amenity of the locality. Similarly, given the nature of the existing and future surrounding development, the proposal is unlikely to result in any adverse amenity impacts on neighbouring properties.

The expected traffic generation of the proposal is considered to be within an acceptable range for the locality and the intended future character of the area. It is not considered to result in any significant adverse impacts on the levels of service of the surrounding road network.

The land is zoned for the proposed development and the proposal is consistent with the recently adopted DCP, the land has been subject of extensive studies and the development should be approved in accordance with the proposal.