SANDY BEACH NORTH

APPENDIX 1 - REV 2

SITE ANALYSIS

BY JHLA

MARCH 2009

PREPARED FOR SANDY SHORES DEVELOPMENT PTY LTD

Contents

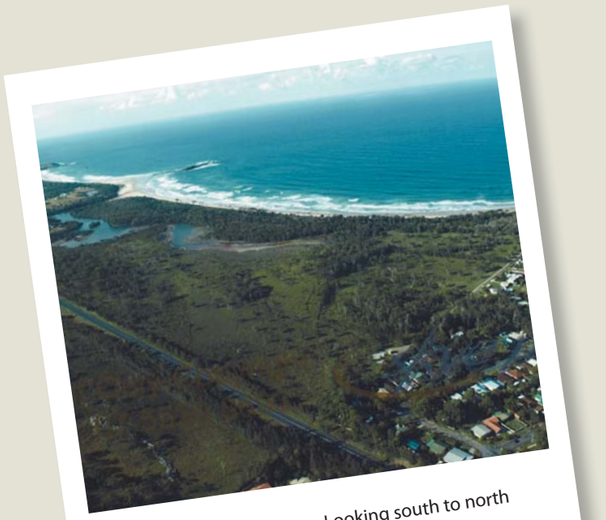


Fig 1 - Existing Site - Looking south to north

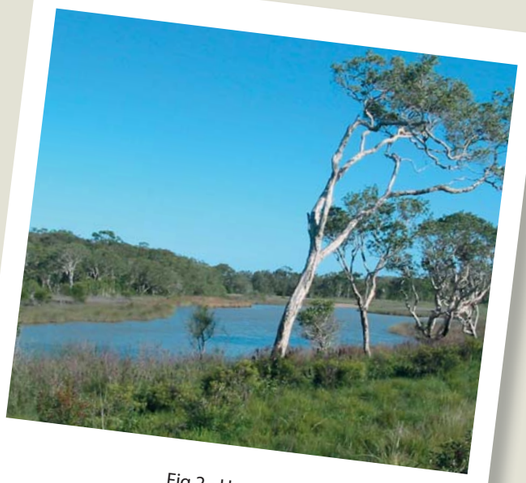


Fig 2 - Hearns Lake

1.0 Introduction

1.1 The site

The development site is located on the NSW mid-north coast, on the eastern side of the Pacific Highway about 3 kilometres south of the North Coast town of Woolgoolga, 16 km north of Coffs Harbour and approximately 570km north of Sydney..

The site is rectangular in shape with a southern boundary of approximately 701 metres, a frontage to the Pacific Highway along the western boundary of 1,049 metres, an irregular frontage to Hearns Lake which runs along the northern and north western boundary. It has almost one kilometre of beach frontage on the eastern boundary.

The land adjoins the northern boundary of the existing village of Sandy Beach, and extends northwards along the side of the Pacific Highway to Double Crossing Creek and Hearns Lake which forms the northern boundary of the property.

It is situated immediately north of the village of Sandy Beach and covers all of the land between the Pacific Highway and Hearns Lake Beach. The southern shoreline of Hearns Lake effectively forms the northern boundary of the site.

1.2 Ownership and legal description

The owner and applicant for the proposed Sandy Beach North Development is Sandy Shores Development Pty Ltd (the Applicant). The site is known as Lot 22 DP 1070182, Pacific Highway, Sandy Beach, Coffs Harbour NSW with an area of 49ha.

The site also includes two adjacent houses, listed as lots 497 and 494988 of DP 227298 , which are the houses numbers 15 and 17 Pine Crescent, Sandy Beach respectively.

1.3 Zoning

The land is zoned Part Residential 2A (low density), Part Residential 2E (Residential Tourist), Part 7A Environmental Protection Habitat and Catchments and Part 7B Environmental Protection/Scenic Buffer).

The proposed development relates to the southern portion of the site zoned 2A Low Density Residential and the northern portion of the site zoned 2E Tourist, as well as portions of 7A and & 7B land under the provisions of Coffs Harbour Local Environmental Plan 2000 (the LEP).

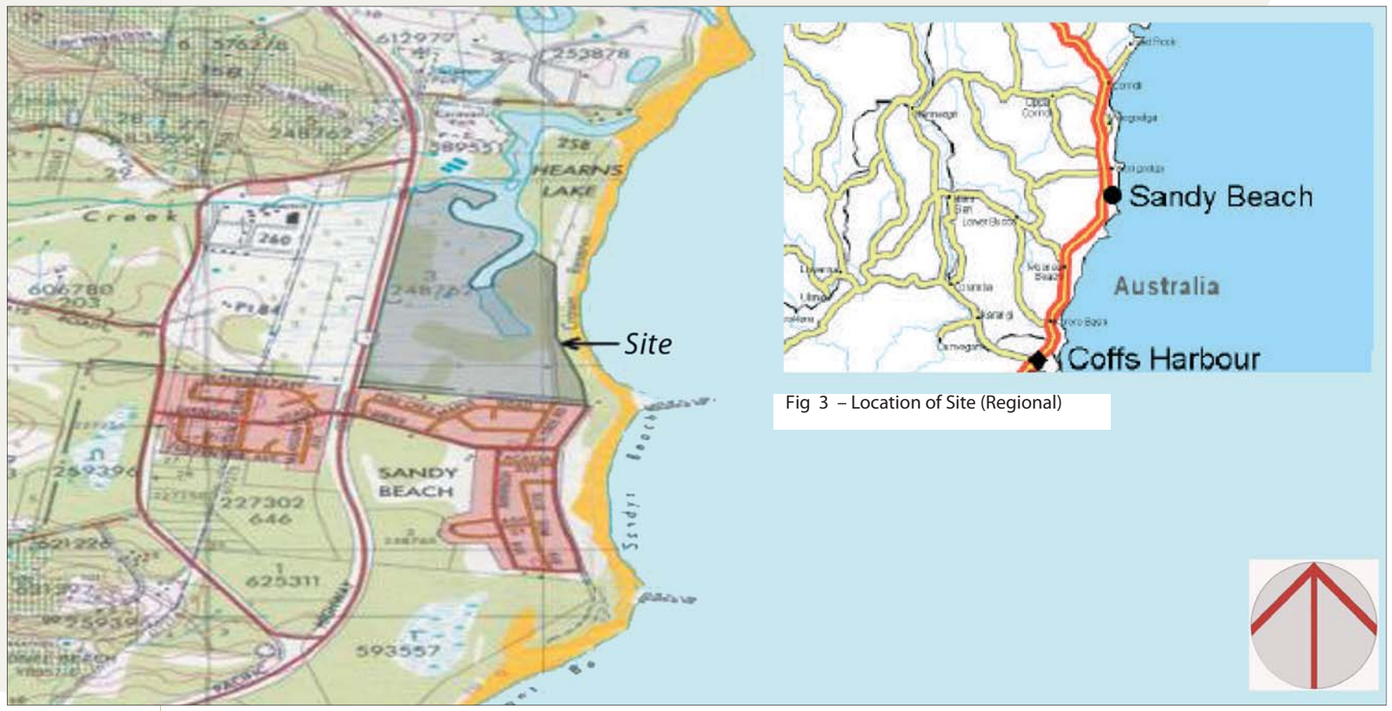


Fig 3 – Location of Site (Regional)

Fig 4 – Location of Site (Local)

2.0 Site Analysis

2.1 Introduction

The analysis and location Plans, together with the Key and the historic Aerial Photographic Survey back to the middle of the last century, provides a glimpse of the main aspects of the existing environment.

2.2 Visual analysis

Of visual prominence is the centrally located Hearns Lake with its vegetated backdrop, along the coastal edge which limits views out to sea. Double Crossing Creek acts as a physical barrier to the north and internal views are generally confined by vegetated pockets along creek edge, Pacific Highway and coastal strip.

The existing vegetation across the site varies from open pasture to more densely vegetated creek and lake shorelines. There is also a corridor of vegetation that extends along the back of the dune system that adjoins Hearns Lake Beach.

Existing residential development to the south and the Pacific Highway along the western boundary with its roadside vegetation confines the site physically and visually in each of these respective directions.

The site is not visually prominent from its immediate surrounding areas with boundary vegetation along its western and eastern edges and by the existing residential development to the south restricting views into the site. Distant views are however gained of the site from nearby hills to the southwest which require consideration in the siting of built form.

2.3 Natural Environment

Key natural site features include Hearns Lake and lagoon estuary with adjacent vegetated coastal strip and beachfront. The site is generally flat with several patches of open woodland cover. The remainder of the site is comprised of scattered, lightly spaced canopy with a low, grassy under storey.

The study area consists of relatively low lying, flat to gently undulating land to the north of Sandy Beach. The dune system bordering the eastern property boundary is heavily modified (a result of sandmining activity) and is heavily colonised with weed species including bitou bush and lantana.

West of the dune the landscape is near flat and dominated by pasture grass interspersed with stands of open woodland. The shallow southern arm of Hearns Lake and its tributary Double Crossing Creek mark the northern margins of the property. The lake itself forms part of a localised wetland. Soils within the study area vary from east to west grading from medium grey, loamy sand (immediately west of the dune system), to grey-black silty loam and alluvium.

2.4 Topography

The site is generally flat with the existing surface elevation across the development site varying between 0.8 mAHD near the Hearns Lake shoreline to 6 mAHD along the rear of the dunes that follow the eastern boundary of the site.

The southern area of the site is steeper but only rises to an elevation of about 5.5 mAHD. This area drains to two open channels that flow in a northerly direction and discharge runoff to Hearns Lake. These channels are man made and are understood to have been constructed in the 1980s.

Hearns Lake is situated behind the coastal dunes along Hearns Lake Beach. It is orientated approximately north-south and receives runoff from a number of minor tributaries in addition to the larger catchment flows from Double Crossing Creek. Under normal conditions, the entrance to Hearns Lake is closed, being effectively “blocked” by the beach berm.

2.5 Flora and Fauna

A detailed vegetation survey of the site was completed by Conacher Travers 2005 and updated in 2008. The vegetation on the site comprises a mixture of remnant open woodland, wet heath and wallum heath dominated by a mixture of eucalypts, banksia and melaleuca species.

Vegetation within surrounding areas to the north and east comprise Banksia dominated dune vegetation or sedgeland/wet heaths associated with the margins of Hearns Lake, although this has been heavily weed infested.

The southern residential areas contain managed gardens and street trees. The land to the west (to the west of the Pacific Highway) contains grazed pasture land with scattered trees and some areas of eucalypt woodland.

Fig 5 - Internal view of Hearns Lake

Vegetation communities present within the subject site. include:

A. Low Forest (Banksia dominated);
B. Forest (Eucalypt dominated);
C. Swamp Sclerophyll Forest;
B/C. Eucalypt / Swamp Sclerophyll Transition Forest;
D. Sandplain Forest (Melaleuca/Corymbia dominated);
E. Wet Heath;
F. Wallum Heath;
G. Sedgeland;
H. Disturbed Woodland;
I. Sandplain Forest (Melaleuca/Mesophyllic sp. dominated);

Two Endangered Ecological Community Areas of Swamp Sclerophyll Forest and Coastal Saltmarsh are present on the site and generally occupy some of the areas below the 1:100 year flood level.

Seven threatened fauna species were observed within the subject site during surveys. These were:

- Grey-Headed Flying Fox (Pteropus poliocephalus),
- Glossy Black-Cockatoo (Calyptorhynchus lathami),
- Wallum Froglet (Crinia tinnula),
- Osprey (Pandion haliaetus),
- Black-necked Stork (Ephipiorhyncus asiaticus),
- Eastern Freetail-bat (Mormopterus norfolkensis),
- Greater Broad-nosed Bat (Scoteanax rueppellii).

The site contains a number of habitats available for use by locally occurring fauna species. The majority of the site is of decreased value for flora and fauna due to the history of disturbance including clearing of trees and understorey, grazing and weed infestation.

The remnant trees within the site provide foraging and potential den/ roost/breeding sites for fauna. The denser vegetation types and aquatic habitats associated with Hearns Lake provide a higher quality and diversity of habitat.

Fig 6 - Remnant vegetation on site

The western portion of the site is characterised by a sparsely vegetated coastal plain. The land in this area has a typical grade of less than 1% and generally slopes from the Pacific Highway toward Hearns Lake. The southern area of the site is steeper and grades in a northerly direction from a maximum elevation of 5.5 mAHD at the southern site boundary to the southern shoreline of the lake.

This southern section of the site is drained by two existing watercourses that appear to be man-made earth lined channels. These channels carry runoff from the northern section of the existing residential precinct of Sandy Beach. The banks of both channels are densely vegetated, particularly in the vicinity of their point of discharge to Hearns Lake.

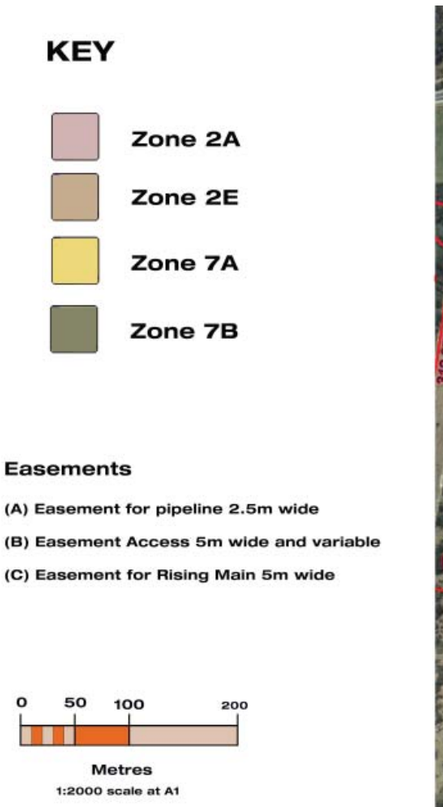
This dunal ridge rises to a crest elevation of between 5 and 6 mAHD. The eastern section of the site between the eastern site boundary and the lake shoreline is typically covered by relatively dense vegetation, particularly along the dunal ridge. This area of the site has typical grades of between 2% and 3% and directs runoff from the dunal ridge toward the shoreline of Hearns Lake.

A localised depression exists along the western boundary of the site . It appears that this coincides with a low point in the Pacific Highway and is fed by runoff from both the highway and areas west of the highway. This runoff appears to be discharged to this depression via a culvert that extends across the highway at this location.

2.6 Stormwater

Hearns Lake is an Intermittently Closed and Open Lake or Lagoon (ICOLL) which drains to the ocean at the northern end of Hearns Lake Beach. The lake has a surface area of about 15 hectares and is fed by catchment runoff that is discharged to the lake via Double Crossing Creek Double Crossing Creek drains a 526 ha catchment that extends to the west of the Pacific Highway and discharges into Hearns Lake immediately downstream of the Pacific Highway bridge crossing.

Fig 7 - Existing open stormwater drain



Site Zones
Boundary Dimensions
Easements

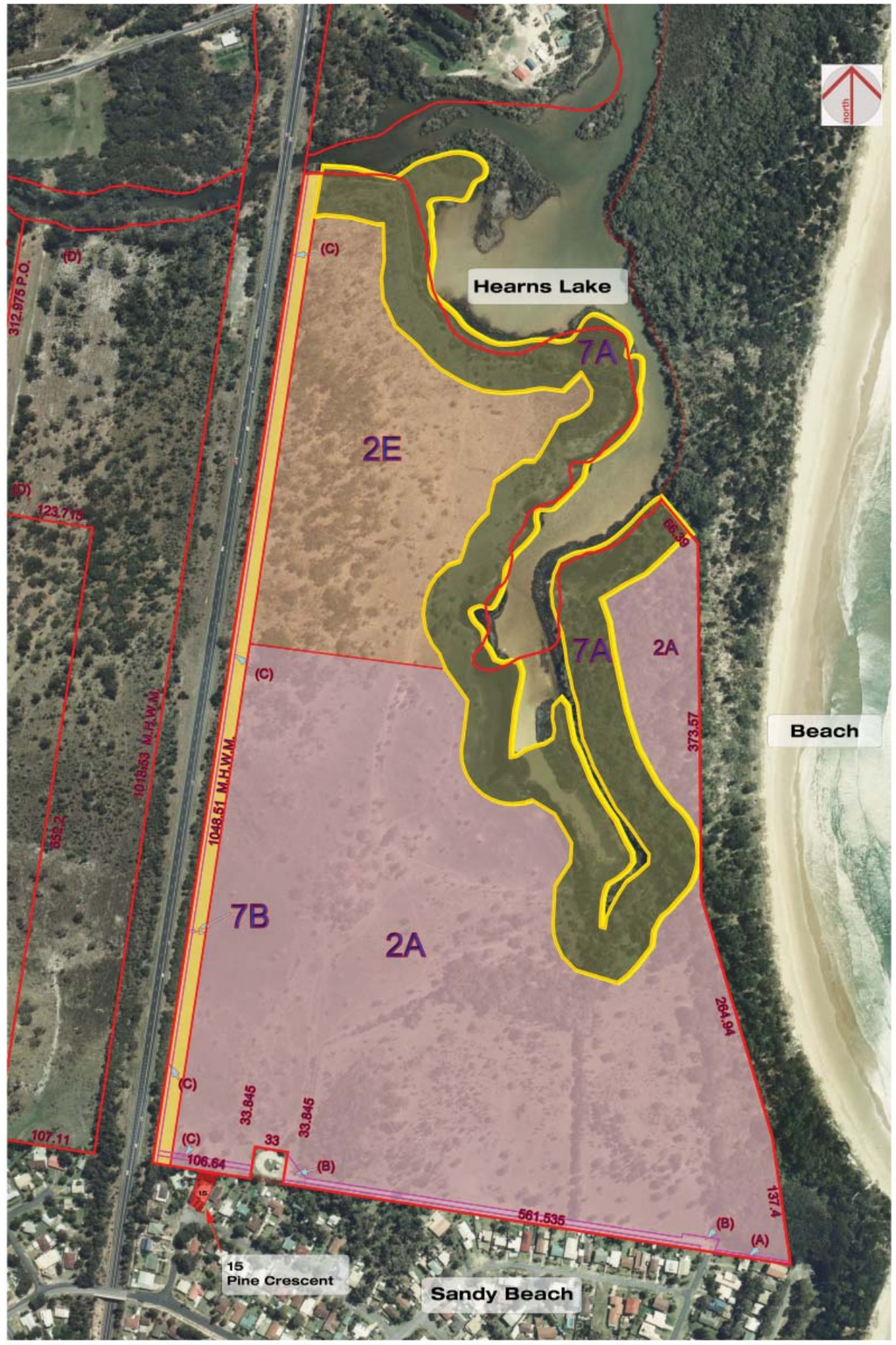


Fig 8 - Site zoning, Dimensions and Easements (Refer also to Appendix 1)

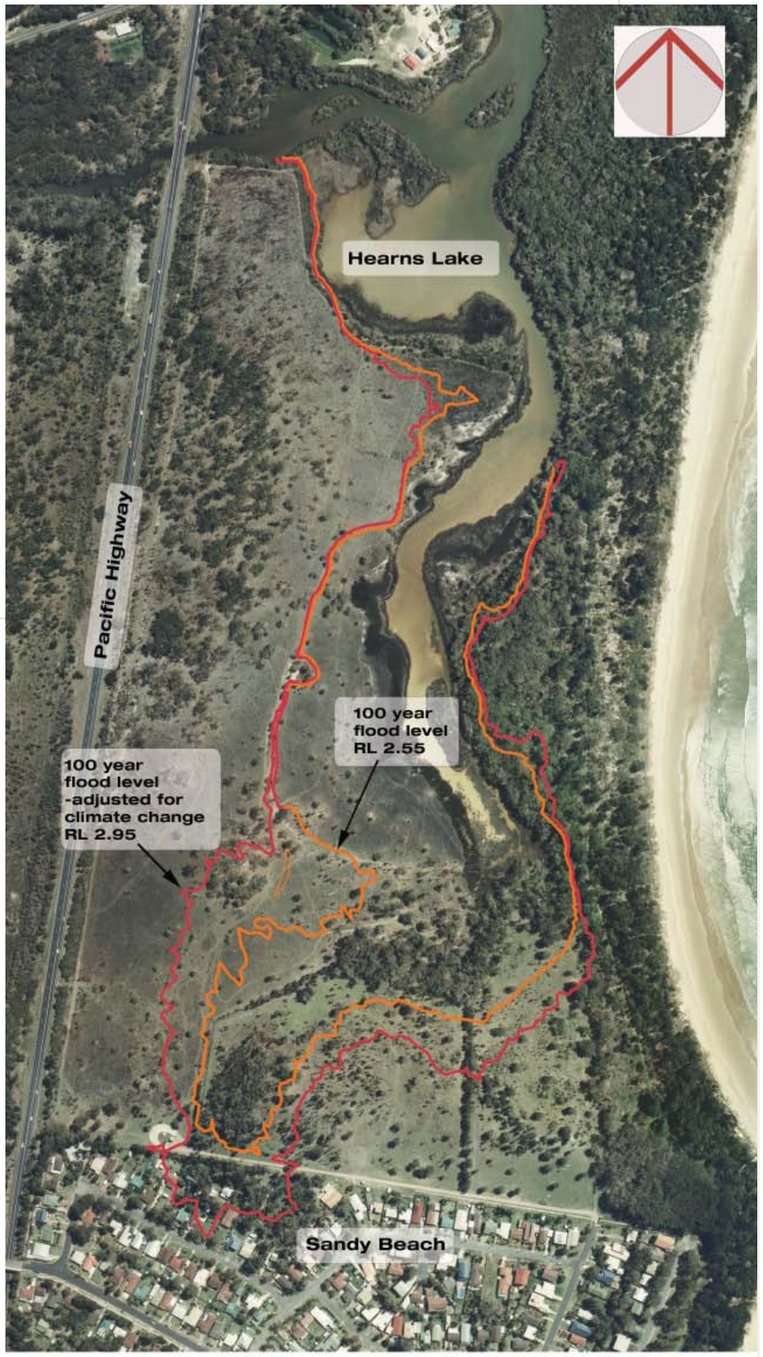


Fig 9 - Flood Levels

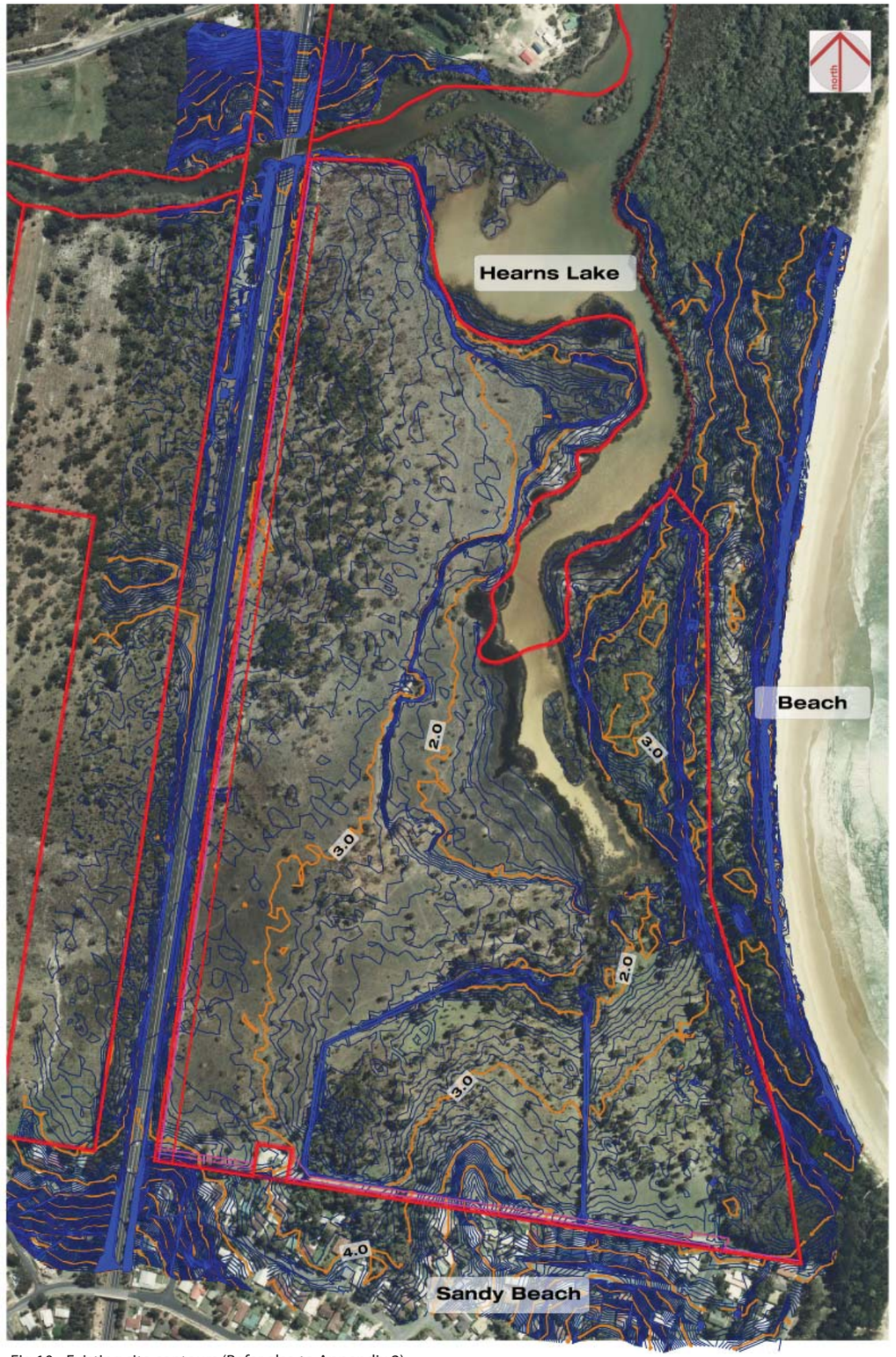


Fig 10 - Existing site contours (Refer also to Appendix 2)

2.7 Geotechnical

The site is generally flat, consisting of predominantly alluvial soil deposits, with residual topsoils of 200–300mm overlying sand and sand with clays.

The test pits indicated that the site is suitable for residential development, supported on high level footings founded in the natural clays of sand soils. The sub-grade soils are likely to vary between clay and sand soils, each of which is suitable for pavement support. Soils were considered suitable for placement of fill and appeared suitable for re-use.

Based on proximity to the lake, the site is unsuitable for on-site effluent disposal. The sandy soils are considered suitable for disposal of storm water and infiltration into site soils. The site was judged as an area with possible occurrence of acid sulphate soils, with a depth of about 1–3m. The opinion was based on a limited amount of sampling over a large site; and it was recommended an Acid Sulphate Soil Management Plan be prepared to guide development of the site.

Refer to report by Coffey Geosciences on Acid Sulphate Soils, and section 8.8.4 of EA.

2.8 Coastal Conditions

The Ocean Beach forms the sites eastern boundary. The coastal dunes generally form a broad sand ridge between the alluvial flats and sand plain of Hearns Lake and the sandy beach to the east.

The development site extends west from the coast to the Pacific Highway and incorporates the southern sections of Hearns Lake. It therefore falls within the 'coastal zone' as defined by mapping that accompanies SEPP 71 – Coastal Protection and the Coastal Protection Act 1979.

Hearns Lake is also an ICOLL that is listed as a coastal lake under Schedule 1 of SEPP 71. It has been classified by the Healthy Rivers Commission (HRC) as being at high risk. The HRC's Coastal Lakes Inquiry Report identifies the potential for relatively high levels of nutrients due to agricultural land uses in the Double Crossing Creek catchment. The HRC subsequently identified Hearns Lake as being in a Healthy Modified Condition.

Coastline hazards were determined by Patterson Britton & Partners , based on the cumulative effects of the 100 year average recurrence interval (ARI) coastal storm erosion, long term recession due to net sediment loss, and long term recession due to sea level rise (over immediate, 50 year, and 100 year planning periods).

2.9 Built Environment

The dominant built features surrounding the site are the Pacific Highway along the western boundary and the existing residential development with its predominant rear fences along the southern boundary.

Existing residential development occurs immediately to the south. A well established Caravan Park is located on the northern side of Hearns Lake.

The site is well served by community facilities. Local public schools are located in Sandy Beach and Woolgoolga. A general store is located within Sandy Beach with major shopping facilities available in Woolgoolga and Moonee.

Fig 12 - Adjacent Beach looking north

2.10 Pedestrians and Cyclists

Pedestrian and cyclist facilities are minimal in the area due to the sporadic nature ofdevelopment, a high speed road environment along Pacific Highway, and relatively long distances between communities. However, due to the low traffic volumes it can be seen that cyclists are able to use the public roads in the vicinity of the site. There are generally no footpaths within Sandy Beach and pedestrians walk on the edge of the residential roads or use the verges. Given the relatively remote nature of Sandy Beach it is considered that there would be little demand for external cyclist and pedestrian trips to centres north and south of the site, however Coffs Harbour City Council is investigatinga cycleway between Coffs Harbour and Woolgoolga, which, it is envisaged, would pass by the development site.

Fig 11 - Panoramic view of site looking east from adjacent ridge

2.11 Access

Access to the subject site is available via a number of local residential roads. All of these roads provide a similar road layout and all connect with existing residential roads. As part of the development, two new road connections will be made, to allow dispersal of trips as well as ensuring good connectivity to the existing residential development surrounding the site. All of these local roads provide a single lane of travel with an overall road width in the order of 7-8 metres. Footpaths are generally not provided, due to the combination of low traffic flows and pedestrian movements.

There is currently no formal access onto the site , although gated access is via the northern end of Sandy Beach Drive. Future traffic access will be initially via an extension of Ti Tree Drive and a future connection from Pine Crescent at the southern portion of the site.

The RTA is currently reviewing the southern intersection of Graham Drive and the Pacific Highway to increase the length of the right turn storage for traffic exiting the side road. This should improve the operations for the right turn out of the side road and reduce the delays for this movement.

Refer to Traffic Impact Assessment by Better Transport Future and sections 6.3 and 8.9 of the EA, regarding proposed options for access to the site. Additionally, a new access to the Pacific Highway at the north-west of the site is also proposed to be provided on construction of the future road upgrade of the Pacific Highway.

Fig 13 - Typical view of Pacific Highway to the west of the site (looking north)

2.12 Acoustics

The Pacific Highway forms the western boundary of the site. Road traffic noise from the Pacific Highway is by far the most significant noise source in the vicinity of the site.

Surf noise associated with a low swell was audible along the eastern boundary of the site during the monitoring. There is moderately dense vegetation along the fore dune to the east of the site and this filtered surf noise such that none is audible within central areas of the site.

2.13 Sevices

Electricity and communication services are available to the site. The Service Authority for electricity is Integral Energy. The site is currently served by overhead power lines off . The Supply authority is Telstra Corporation and Sandy Beach is located within the Woolgoolga Exchange area.

Sewerage infrastructure in the vicinity of the developemnt site is operated and managed by Coffs Harbour Water, which is a subsidiary of Coffs Harbour City Council. An existing pumping station is located in the south-western corner of the site and currently services the existing residential precinct of Sandy Beach. Sewerage is pumped to the nearest Treatment Plant which is located approximately 5km to the north from the site.

Water services are in the local area but do not currently extend to the site.

2.14 Public Transport

Public transport is limited in the general vicinity of the site. There are several school bus runs operated in the general locality of Sandy Beach by Ryans Bus Service. These provide a service to Woolgoolga and Grafton to the north and Coffs Harbour to the south. These routes provide a regular bus service for the school bus runs and limited runs Monday to Friday. The Saturday service is less frequent , with no services Sundays or public holidays.

2.15 Aboriginal Heritage

Aboriginal Heritage assessment was undertaken by Mary Dallas and Dan Tuck with report issued in December 2004 and updated in 2008. The study follows an earlier archaeological study undertaken in 1983.

2.16 European Heritage

No sites or items of European cultural heritage significance or areas of historical archaeological potential were identified within the study area through. Physical traces of modification of the study area relate predominantly to the middle to late 20th century and have low cultural heritage significance and no archaeological value.

Historical data indicates:

- The study area has predominantly been utilised for coastal grazing - with sand mining occurring on its eastern margin in the late 1960s/early 1970s, and road construction occurring along the western margin in the 1970s/1980s.
- Grazing (particularly land clearing associated with the maintenance of open grazing areas and promotion of pasture) and mining, have altered the physical landscape.
- Evidence of past use is the modified landscape itself – which is replicated at other locations in nearby areas
- No residential structures (such as houses) are known to have been constructed within the study area.

Given the history of the site there are unlikely to be any other significant tangible physical traces of past use (relics).

- Historical research indicates that it is unlikely that relics of European cultural heritage significance exist within the study area.
- No items listed within statutory or non-statutory heritage lists, databases or schedules exist within the study area.
- No sites or items of European cultural heritage significance or areas of historical archaeological potential were identified within the study area during the site inspection.

Significance - The study area has been assessed as having low cultural heritage significance and low archaeological potential and sensitivity.

2.17 Site Analysis Mapping

Fig 14 - Remnant vegetation on site

Fig 15 - Panorama of coast

Fig 16 - The site – Looking north to south

Key

1. RL 2.55 ICOL Extent
2. Existing vegetation
3. Coastal Hazard Line
4. Aboriginal Site - PAD1
5. Aboriginal Site - SBN1
6. Aboriginal Site - ISF2
7. Caravan Park
8. Sewer Pumping Station
9. Drainage Channels
10. Sand Dune
11. Pacific Highway
12. To Woolgoolga
13. To Coffs Harbour
14. Nos 15 and 17 Pine Crescent, Sandy Beach
15. 100m riparian setback from south-western shore of lake

Coastal Hazard Line

Coastline hazards were determined by patterson britton & partners , based on the cumulative eff ects of the 100 year average recurrence interval (ari) coastal storm erosion, long term recession due to net sediment loss, and long term recession due to sea level rise (over immediate, 50 year, and 10 year planning periods).

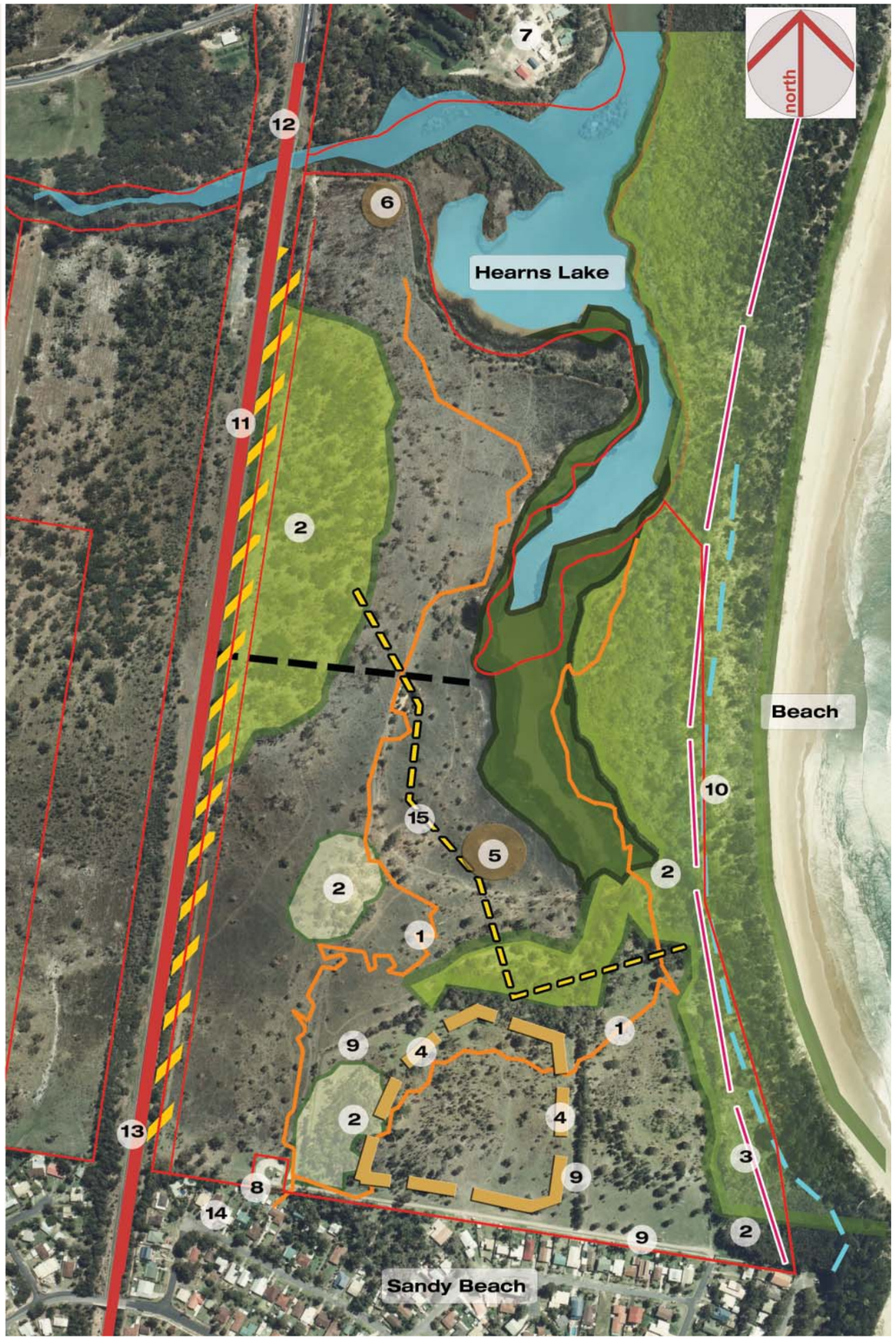


Fig 17 - Site Analysis Plan (Refer also to Appendix 3)

3.0 Regional Overview

3.1 Coastal Region

The Mid North Coast Region has been one of the fastest and most consistent growth regions of NSW. This growth has seen the ongoing expansion of the settled area of the Region, as well as a continuing demand for more housing in both new urban areas and through the redevelopment of existing centres. The demand for new dwellings will be driven by a number of factors including population increase, tourism and the impact of changing demographic trends on housing preferences.

Understanding the position of the site within its regional context is essential in order to maximise the opportunity for development of Hearns lake as an integrated part of the broader Coffs Harbour region. This context provides the physical, economic, cultural, spiritual and ecological framework for achieving a sense of place.

3.2 Existing Sandy Beach Village

The Sandy Beach subdivision was established in the mid 1970s with construction and infrastructure well underway in the early 1980s.
Impacts on the study area, which resulted from the establishment of the subdivision, included the construction of a sewerage pumping station in the southwest corner of the property and two open drainage channels. The latter features drain the subdivision via pipes and open concrete drainage channels and run southnorth across the study area towards Hearnes Lake. It is likely that over the past 20 years or so, these channels, which are now lined with casuarinas and the occasional paperbark, have altered the pre-existing drainage and vegetation regime of the area.

3.3. Adjacent townships - Woolgoolga & Moonee

Woolgoolga 3km north and Moonee 5km south of the site offer considerable facilities as local regional centres, providing a range of commercial, retail, community and light industrial facilities.

3.4 Leisure and Community Facilities

Coffs harbour offers a number of major regional leisure facilities

Additionally, locally the district has established sporting clubs, particularly in Woolgoolga including Bowling and Golf associated with the RSL

The local district caters for numerous religions including - Sikh, Uniting, Anglican, Catholic.

The district offers numerous health facilities, in particular Coffs Harbour Base Hospital and Woolgoolga Health Campus.

3.5 Education Facilities

Regional education facilities include private and state primary and secondary schools, notably in the Woolgoolga High School, Sandy Beach Public School (K-6) and St Francis Xavier Primary School (K-6)

In addition childcare is available locally in Sandy Beach and Woolgoolga.

Fig 20 - Regional context diagram

Fig 18 - Sandy Beach coastal reserve

Fig 19 - Typical residential street

Fig 21 - Woolgoolga main street looking east

Key

1 Hearns Lake
2 Sandy Beach (refer inset)
3 Pacific Highway
4 Woolgoolga
5 Woolgoolga Public School
6 Woolgoolga High School
7 Sandy Beach Public School
8 Existing public Reserve
9 Existing Shop / Cafe
10 Graham Drive
11 Diamond Head Drive over Pacific Highway
12 Double Crossing Creek

Fig 22 - Local District

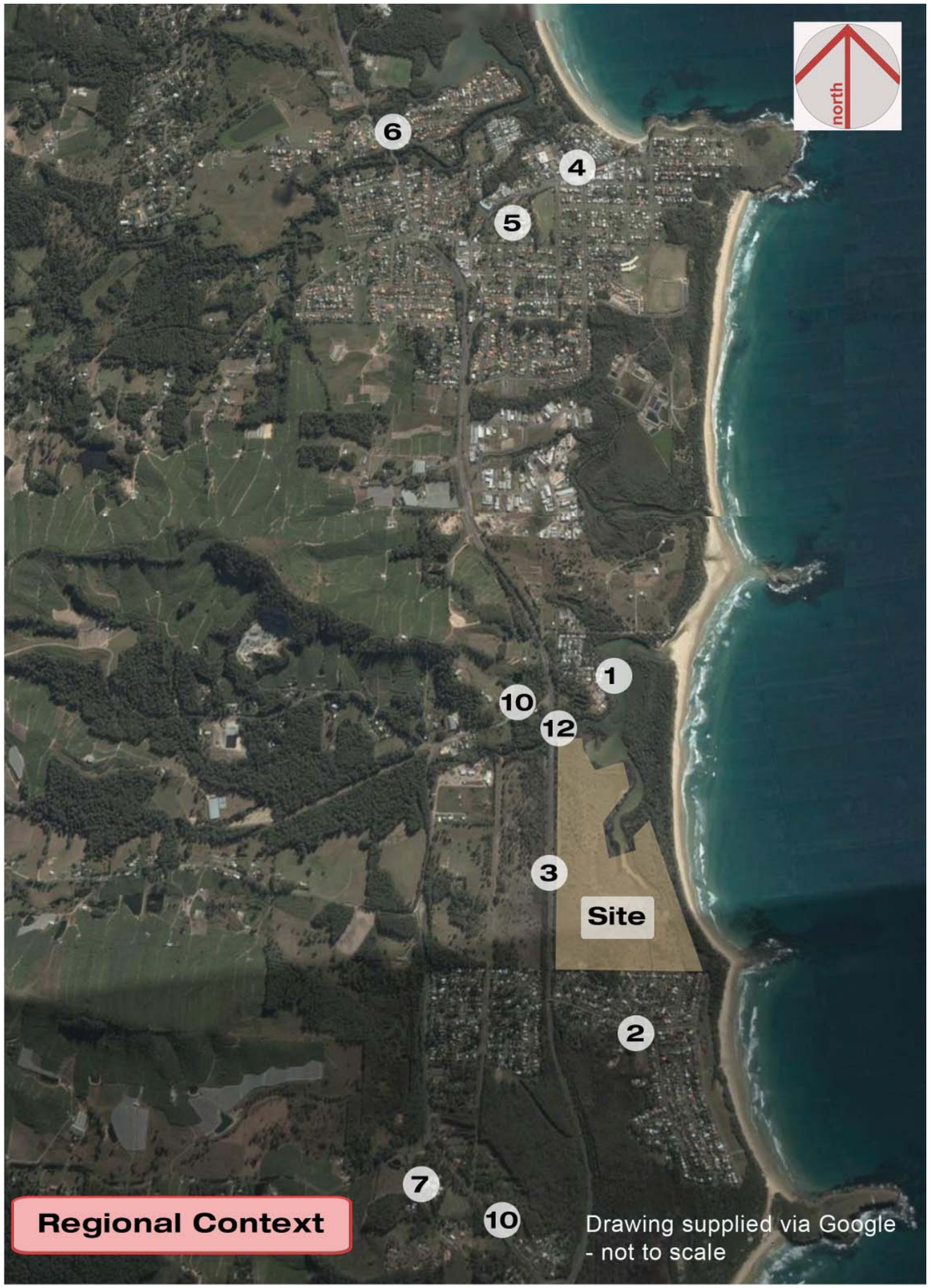


Fig 23 - Regional Context

4.0 Changing Conditions

Timeline:

Pre mid 1960s Pastoral (Coastal pastoralism – use of the land for the grazing of stock predominantly from the c.1960s , but probably pre-dating this)

1960s- Highway construction – the realignment and re-routing of the Pacific Hwy from its former location west of the study area to its current location bordering the western boundary.

Late 1960s to early 1970s – coastal sandmining

(Sandmining - mineral extraction from the primary dune system on the eastern margin of the study area (post 1960)

Mid 1970s to current Pastoral

Mineral sandmining took place at a number of coastal locations between Coffs Harbour and Woolgoolga between the 1940s & 1970s. Historic aerial photography shows that mineral extraction from the primary dune system on the eastern margin of the study area occurred some time in the 1960s, with rehabilitation works underway by the early 1970s.

The site is currently used for grazing purposes. This combined with earlier sand mining in the coastal strip during the 1960s and 1970s past uses has resulted in a fundamentally altered and degraded ecological environment.

Site Aerials (Supplied by Paterson Britton and Asquith Dewitt)

~ Era of coastal sandmining ~

Fig 24 - 1956 Aerial

Fig 25 - 1969 Aerial

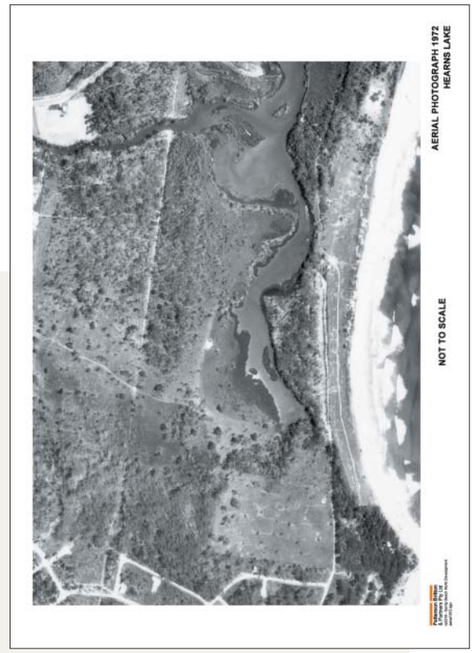


Fig 26 - 1972 Aerial

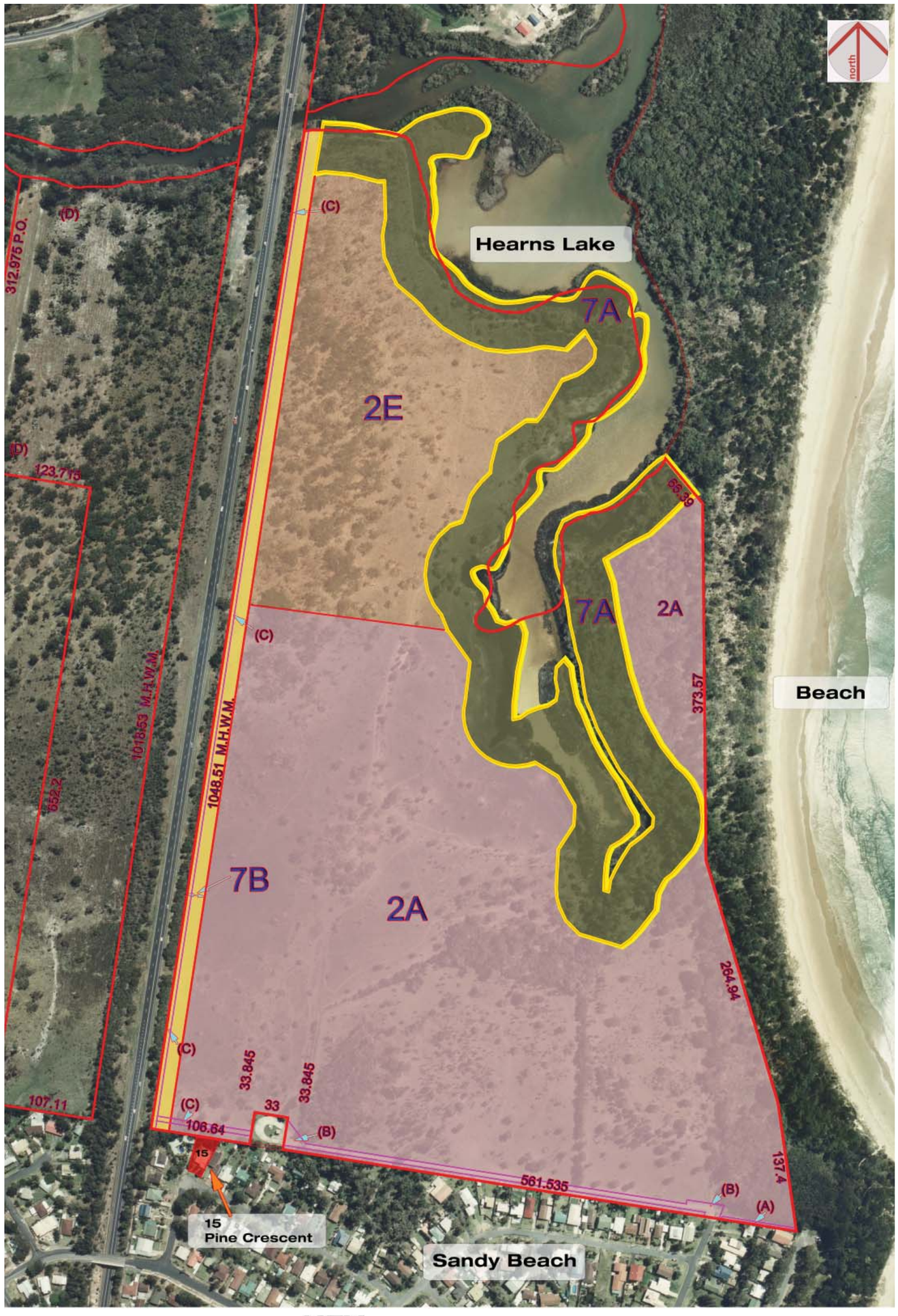
Fig 27 - 1980 Aerial

Fig 28 1993 Aerial

Fig 29 2000 Aerial

Fig 30 2004 Aerial

Appendices



KEY

0 50 100 200

Metres

1:2000 scale at A1

- Zone 2A
- Zone 2E
- Zone 7A
- Zone 7B

Easements

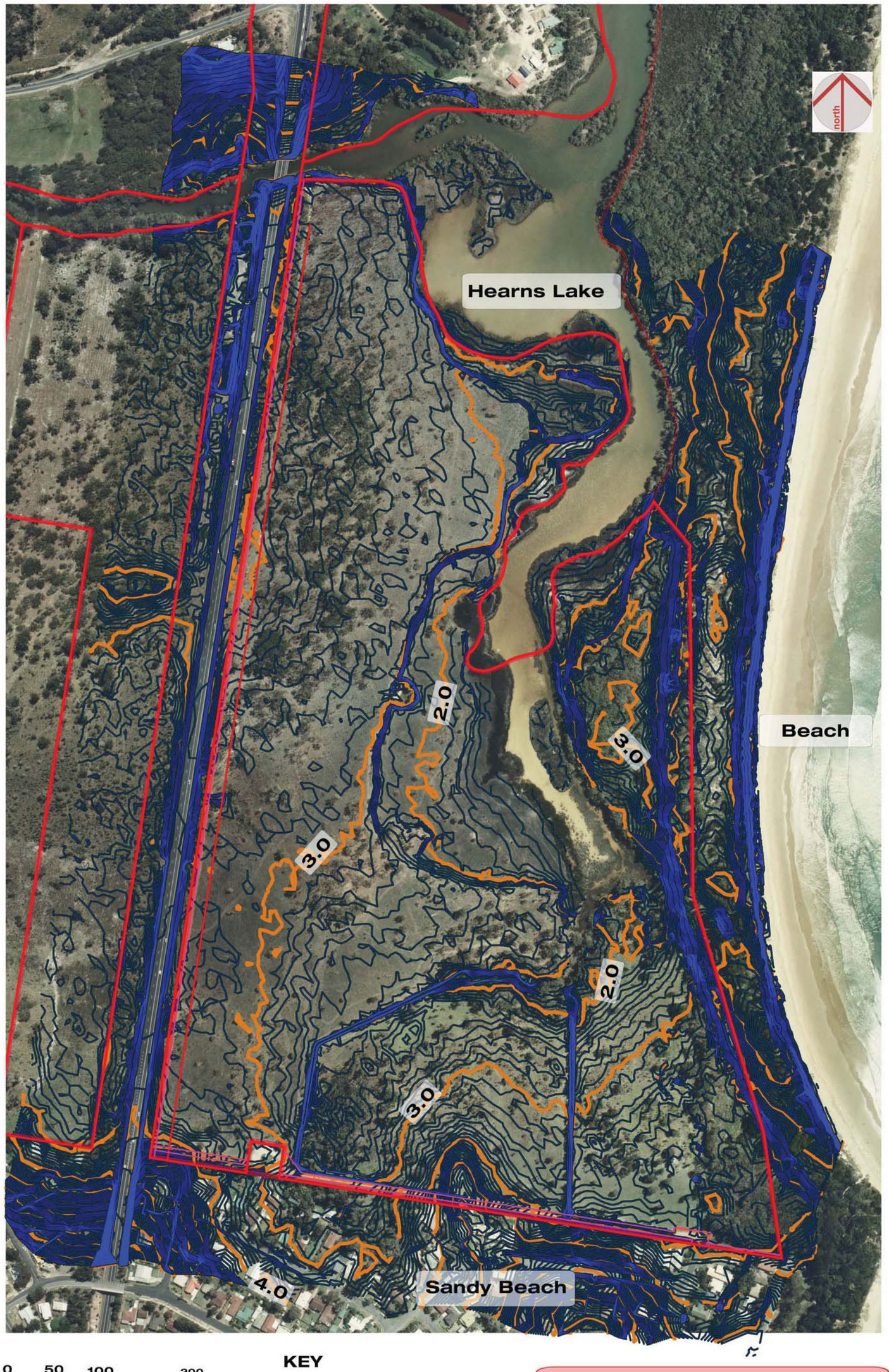
(A) Easement for pipeline 2.5m wide

(B) Easement Access 5m wide and variable

(C) Easement for Rising Main 5m wide

Site Zones
Boundary Dimensions
Easements

Appendix 1



0 50 100 200

Metres

1:2000 scale at A1

KEY

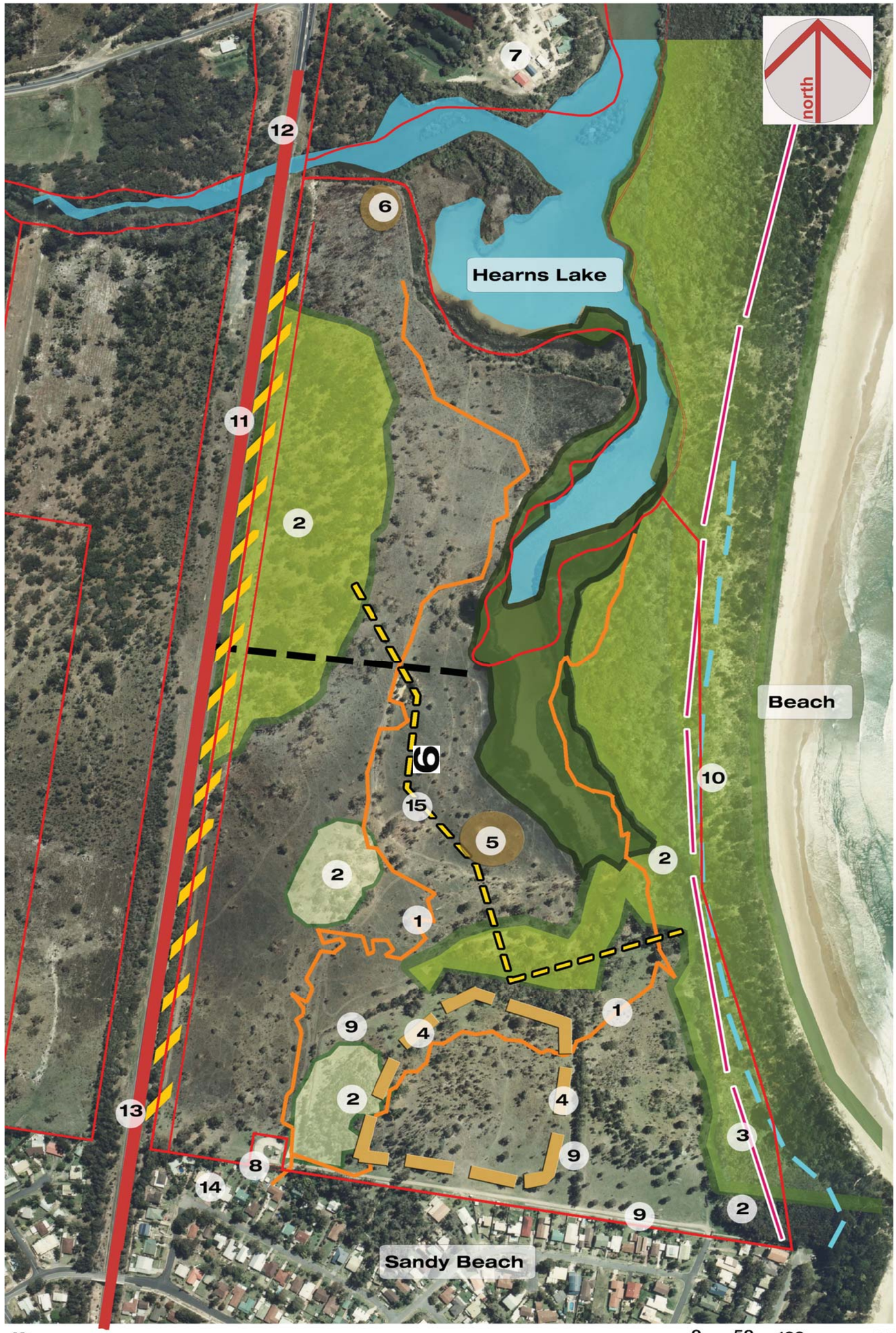
KEY

1m contour intervals

0.2m contour intervals

Existing site contours

Appendix 2



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9. Drainage Channels
10. Sand Dune
11. Pacific Highway
12. To Woolgoolga
13. To Coffs Harbour
14. Nos 15 and 17 Pine Crescent
15. 100m riparian setback from south-western shore of lake

0 50 100 200

Metres

1:2000 scale at A1

Site Analysis

Appendix 3