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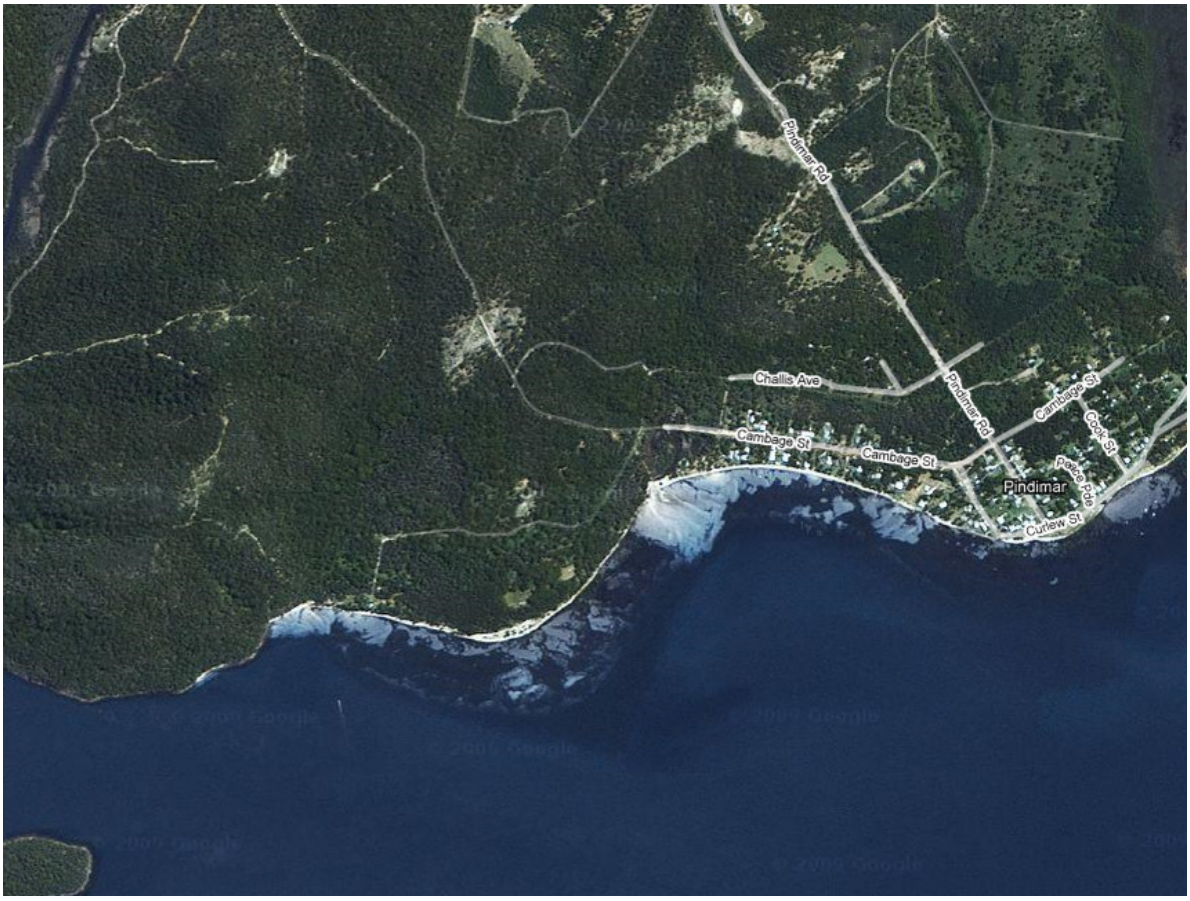
EcoNomics

Proposed Abalone Farm- Pindimar

Preliminary Environmental Assessment Report



301017-00261

14 January 2010

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PROJECT 301017-00261 PINDIMAR ABALONE FARM

REV	DESCRIPTION	ORIG	REVIEW	WORLEY-PARSONS APPROVAL	DATE	CLIENT APPROVAL	DATE
A	Draft Prelim EAR for client review	J. Kral	-	-	20/10/09	Yes	19/11/09
B	Draft Prelim EAR for submission to DoP	J. Kral	G.Fielding	G.Fielding	20/11/09	Yes	07/12/09
O	Final Prelim EAR submission to DoP (no change from draft)	J.Kral	-	-	14/01/10	-	14/01/10

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1. INTRODUCTION

1.1 Background and Project Context

This Preliminary Environmental Assessment Report (Preliminary EAR) is submitted to the Department of Planning (DoP) under Part 3A of the *Environmental Planning and Assessment Act 1979* (EP&A Act) to support a Major Project Application for a proposed Abalone farm at Clarke Street, Pindimar, in the Great Lakes and Port Stephens Local Government Areas. This Preliminary EAR has been prepared by WorleyParsons (incorporating Planning Workshop Australia) on behalf of the applicant, Austasia Leefield Pty Ltd.

A previous Development Application (DA) for the proposed development was submitted to Great Lakes Council (GLC) in 2003 under Part 4 of the EP&A Act (it is noted that Port Stephens Council (PSC) delegated their consent authority to GLC). The DA (313/2003) was classed as designated development and underwent intensive review and assessment by the Council and a large number of government agencies, and was subject to extensive public exhibition and consultation periods. This process resulted in the refinement of the proposal and the subsequent issuing of development consent by the Council on 4 July 2006. As required, all relevant government agencies issued their general terms of approval. However a local community group objector, the Pindimar Bundabah Community Association, appealed to the Land & Environment Court against the Council's decision under Section 98 of the EP&A Act (LEC Proceedings 10679/2006). The appeal was upheld, due to the requirement for additional detailed development plans during the appeal which could not be met in the required timeframes. The applicant was also fearful of excessive legal costs and therefore agreed to the making of consent orders allowing the appeal.

It is considered that all plans associated with the proposal that DoP may require can now be produced. Accordingly, the proposed development is submitted for consideration under Part 3A of the EP&A Act.

On 17 October 2007, the Minister for Planning formed the opinion that the proposed development of an Abalone farm is a project to which Part 3A of the Act applies, as it is '*development for the purposes of aquaculture located in environmentally sensitive areas of State Significance'*. This class of development is listed in Schedule 1 of *State Environmental Planning Policy (Major Projects) 2005,* now known as *SEPP (Major Development) 2005*. The Record of the Minister's opinion is attached at Appendix 1 of this Preliminary EAR.

1.2 Purpose of the Report

The purpose of this Preliminary EAR is to outline the nature of the Project and identify the environmental issues that will be relevant to the Project.

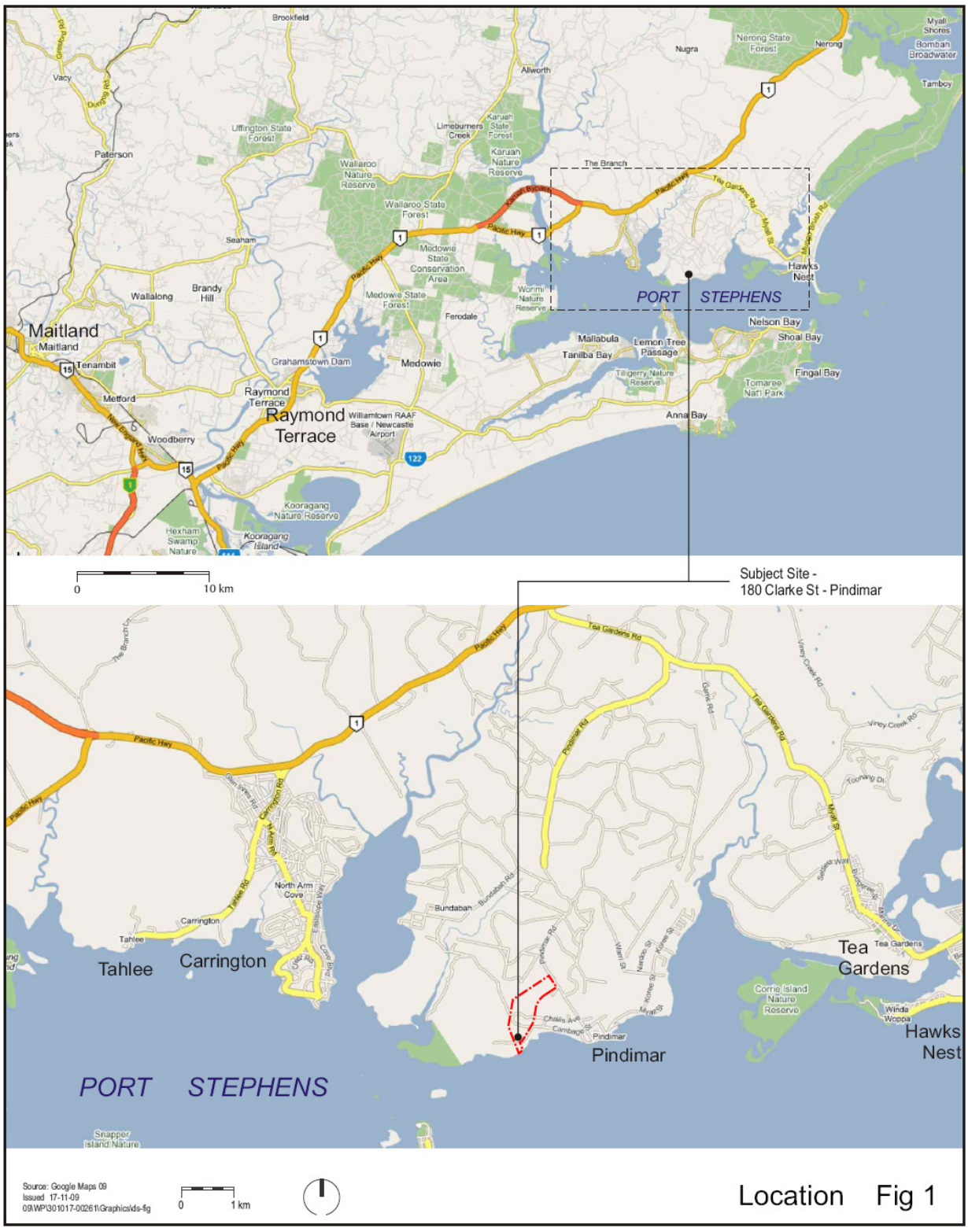
The Preliminary EAR is submitted to DoP under Part 3A of the EP& A Act to assist the Director-General in establishing the environmental assessment requirements for the preparation of the Environmental Assessment Report (EAR).

This Preliminary EAR describes the site in Section 2; provides an outline of the Project in Section 3; and lists the relevant strategic and statutory matters in Section 4. Section 5 identifies the potential environmental impacts of the proposal, and Section 7 provides concluding comments.

The location and zoning of the site, including an aerial view, are shown in Figures 1- 5.

1.3 The Applicant

The applicant for this Project is Austasia Leefield Pty Ltd.


Maitland
Raymond Terrace
PORT STEPHENS
Subject Site -
180 Clarke St - Pindimar
Tahlee
Carrington
Pindimar
Tea Gardens
Hawks Nest
PORT STEPHENS
0
10 km
0
1 km
Source: Google Maps 09
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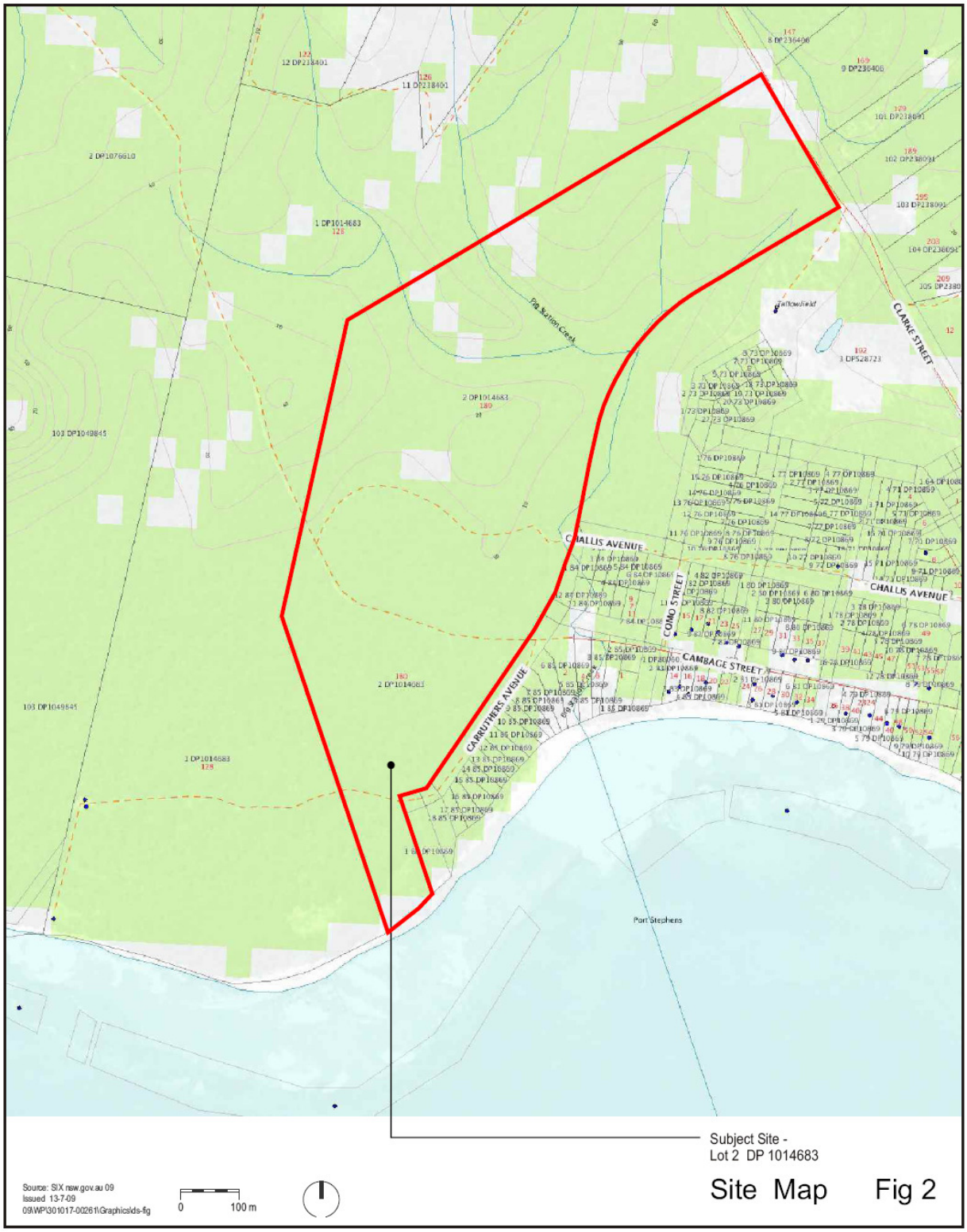
Location Fig 1


CLARKE STREET
CHALLIS AVENUE
CHALLIS AVENUE
COMO STREET
CAMBAGE STREET
CARRUTHERS AVENUE
Port Stephens
Subject Site -
Lot 2 DP 1014683
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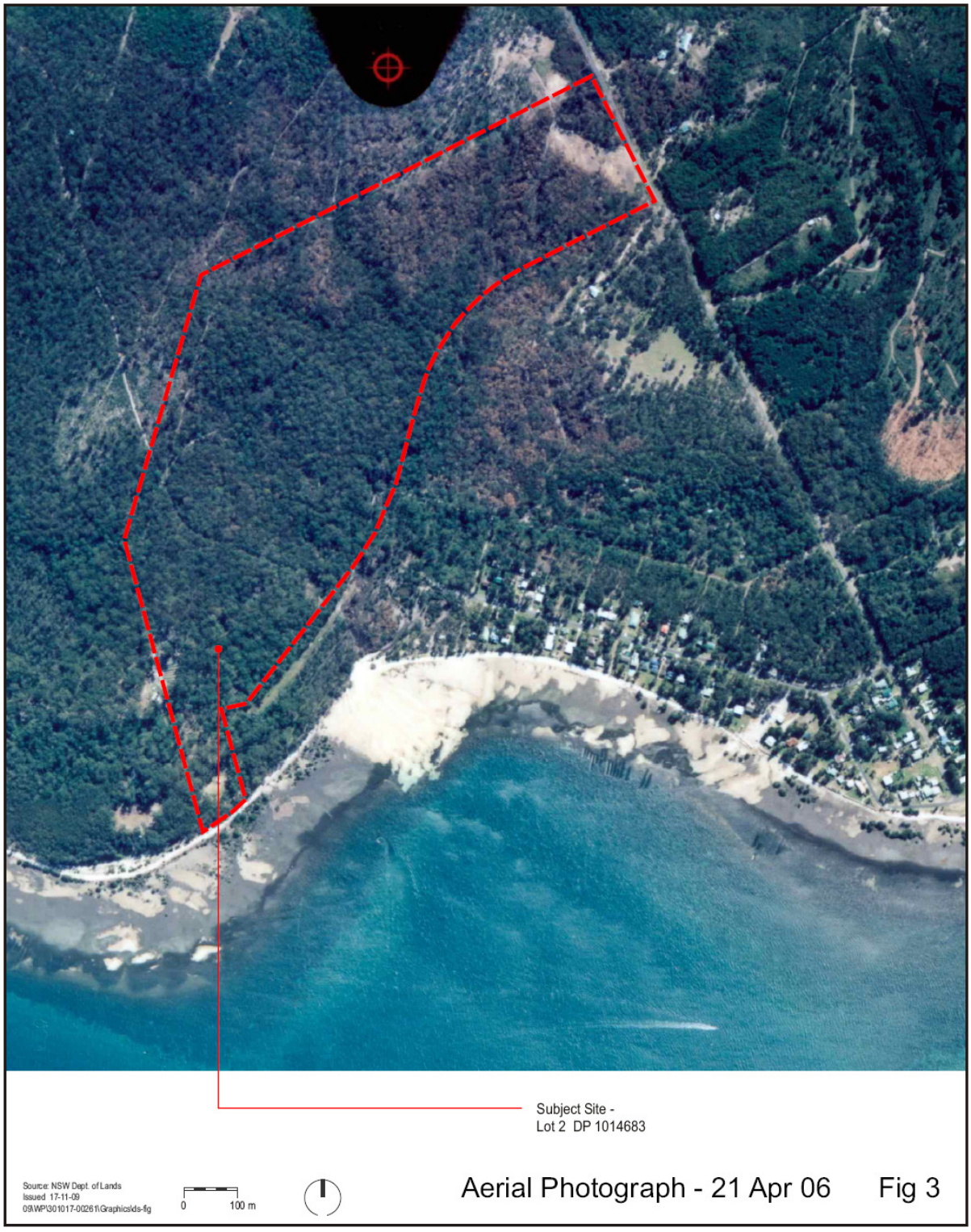
Site Map Fig 2


Subject Site -
Lot 2 DP 1014683
Source: NSW Dept. of Lands
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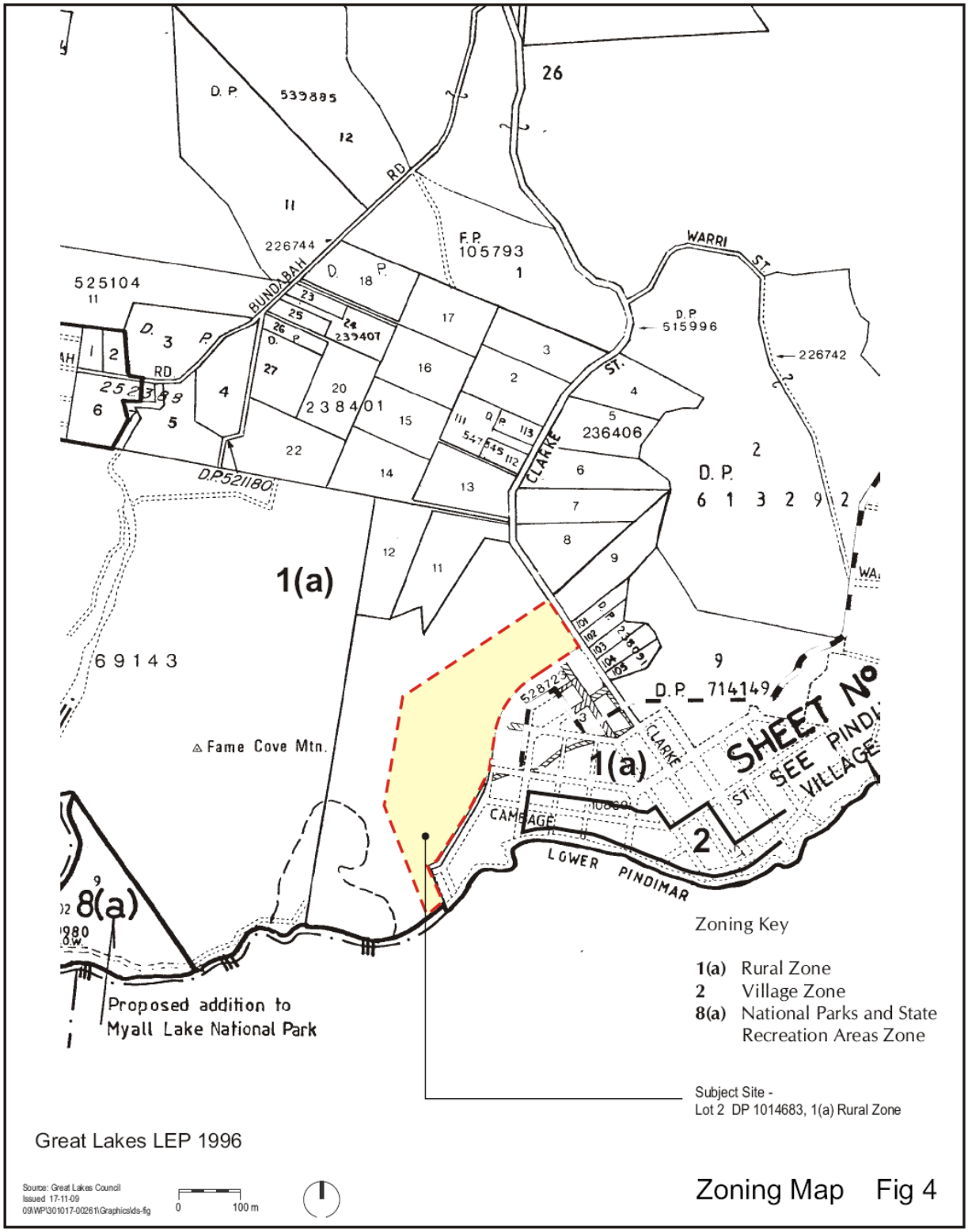
Aerial Photograph - 21 Apr 06
Fig 3


D. P. 539885
12
11
RD.
26
226744
F.P. 105793
1
WARRI ST.
525104
11
BUNDABAH
D. P. 18
23
25
24
239407
26 D. P.
17
16
3
2
4
D.P 515996
226742
D. P. 3
RD
27
20
2 3 8 4 0 1
15
111 D.P. 113
547 545 112
5
236406
CLARKE ST.
22
14
13
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7
8
9
D.P.521180
2
D. P. 6 1 3 2 9 2
12
11
1(a)
6 9 1 4 3
Fame Cove Mtn.
D.P. 714149
528123
CLARKE ST.
1(a)
SHEET No
SEE PINDI VILLAGE
CAMBAGE
2
LOWER PINDIMAR
8(a)
Proposed addition to
Myall Lake National Park
Zoning Key
1(a) Rural Zone
2 Village Zone
8(a) National Parks and State Recreation Areas Zone
Subject Site -
Lot 2 DP 1014683, 1(a) Rural Zone
Great Lakes LEP 1996
Source: Great Lakes Council
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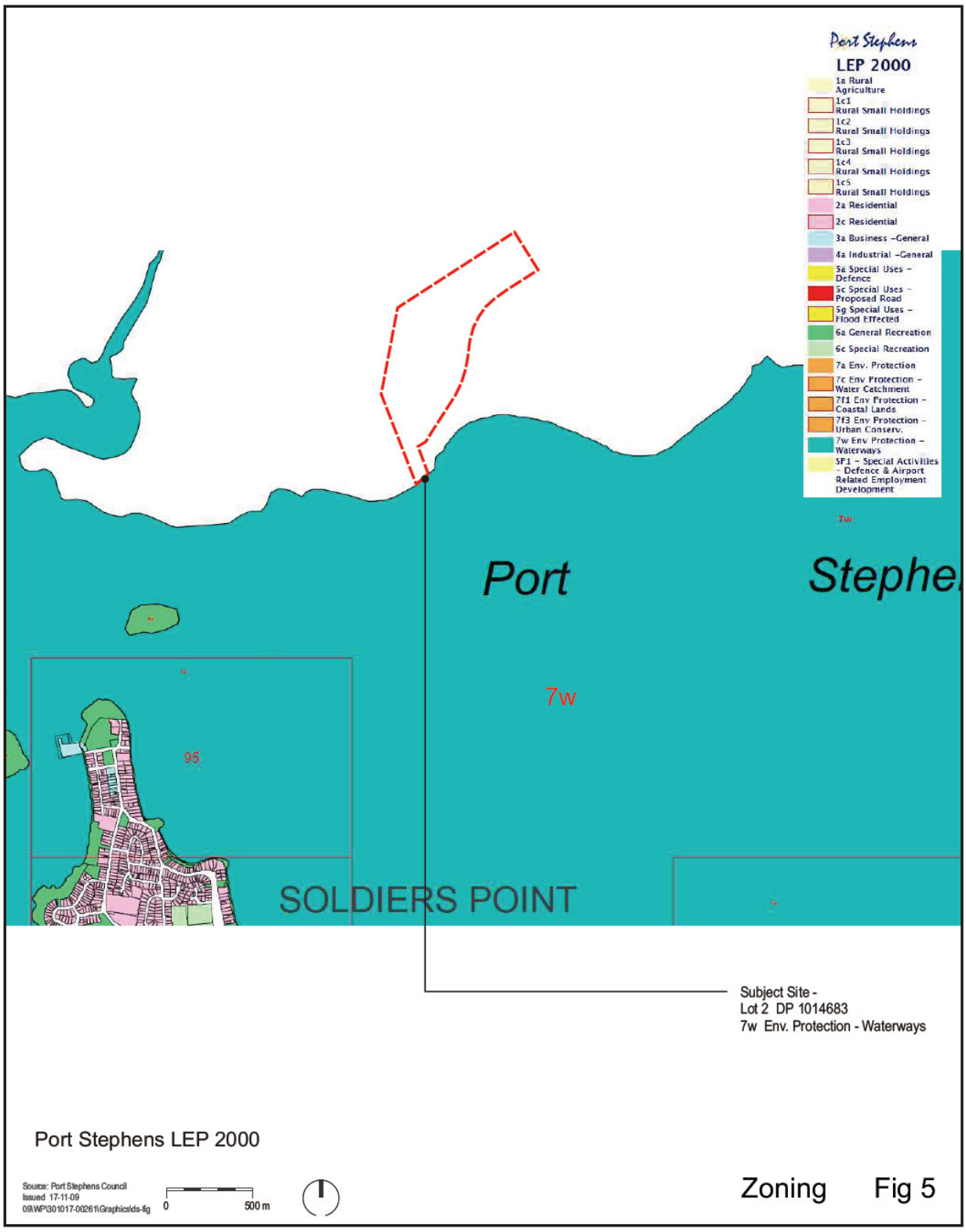
Zoning Map Fig 4


Port Stephens
LEP 2000
1a Rural Agriculture
1c1 Rural Small Holdings
1c2 Rural Small Holdings
1c3 Rural Small Holdings
1c4 Rural Small Holdings
1c5 Rural Small Holdings
2a Residential
2c Residential
3a Business -General
4a Industrial -General
5a Special Uses - Defence
5c Special Uses - Proposed Road
5g Special Uses - Flood Effected
6a General Recreation
6c Special Recreation
7a Env. Protection
7c Env Protection - Water Catchment
7f1 Env Protection - Coastal Lands
7f3 Env Protection - Urban Conserv.
7w Env Protection - Waterways
SP1 - Special Activities - Defence & Airport Related Employment Development
Port
Stephe
7w
95
SOLDIERS POINT
Subject Site -
Lot 2 DP 1014683
7w Env. Protection - Waterways
Port Stephens LEP 2000
Source: Port Stephens Council
Issued 17-11-09
0
500 m
Zoning Fig 5

2. THE SITE

2.1 Location

The proposed development requires a relatively small area of land located in the southern portion of a site located at No. 180 Clarke Street, Pindimar, on the northern shore of the waters of Port Stephens. The site is situated to the west of the residential area of South Pindimar and south-east of the township of Bundabah, and is located generally to the north of the township of Salamander Bay, across the Port Stephens waterway. Pindimar is located approximately 25km and 18km respectively from the townships of Karuah and Tea Gardens/ Hawks Nest, and approximately 52km from the major centre of Raymond Terrace. The subject land is located within the Great Lakes Local Government Area (LGA), just north of the boundary with the Port Stephens LGA (located below the Mean High Water Mark).

Clarke Street borders the site's north-eastern boundary while Carruthers Avenue (an unformed road) runs along the south-eastern boundary. The site is currently accessible from Clarke Street in the north, and Challis Avenue, to the east. Challis Avenue is an unformed road which is accessible from Como Street (predominantly unformed, with some gravelled areas) and Cambage Street. Figures 1 and 2 illustrate the site's location.

2.2 Site Description

The subject land comprises a single irregularly shaped allotment, with an area of approximately 51 hectares. It has frontages of 262m to Clarke Street to the north, 120m to the waters of Port Stephens to the south, 516m to the unformed Carruthers Avenue, and 34m to the unformed Challis Avenue, both located east of the site. It is predominantly undeveloped and is covered with relatively dense native vegetation comprising 10 vegetation communities, dominated by Smooth-barked Apple/ Stringybark Forest. One Endangered Ecological Community, Swamp Mahogany- Paperbark Forest, is located predominantly in the southern portion of the site. Refer to Section 5.17 of this Preliminary EAR for more details on flora and fauna.

The site's topography is characterised by a flat and low-lying southern area, part of which has a frontage to Port Stephens. This land then rises relatively gently to a knoll about 20m high in the centre of the site, followed by a higher ridgeline 30-40m high in the northern part of the site. This ridgeline extends and rises across the adjoining land to the north-west. Between the ridgeline and the knoll in the centre of the site is a saddle accommodating two main drainage lines leading to Pig Station Creek.

Several small areas within the site have been cleared in the past for development, while some additional areas, particularly in the vicinity of existing development, have been partially cleared through underscrubbing. Existing built development, limited to the small, cleared areas, includes:

- An orchard, mainly comprising Kaffir Lime trees, near the site's south-western boundary;
- An outbuilding near the site's southern boundary with Port Stephens;

- Several small farm dams, including one near the site's Clarke Street frontage and one in the location of the proposed development on the slopes of the initially rising land in the central portion of the site;
- Electricity transmission lines along the site's south-eastern boundary and then underground in a westerly direction across the lot;
- A number of informal, dirt roads traversing the site

The western edge of an Aboriginal shell midden has been identified along the site's southern boundary with Port Stephens. This is discussed further in Section 5.2.

The subject land is zoned 1(a) Rural under the *Great Lakes Local Environmental Plan 1996*, as shown in Figure 4. Beyond the shore of Port Stephens, below the Mean High Water Mark, land is zoned 7(w) Environment Protection- Waterways under the *Port Stephens Local Environmental Plan 2000*, as shown in Figure 5.

The following photographs show various views of the subject site.

Plate 1: Entrance to site from Challis Avenue (unformed), looking west into site. Note that no development currently exists along Challis Ave.

Plate 2: Native vegetation within the southern portion of the site

Plate 3: Electricity lines adjacent to the site's south-eastern boundary. These lines begin within the site before proceeding along and just inside the unformed Carruthers Avenue

Plate 4: Existing informal roads providing access throughout site

Plate 5: Roads and cleared area leading to cultivated gardens and storage areas (adjacent to south-western boundary)

Plate 6: Kaffir Lime tree orchard and storage area adjacent to south-western boundary

Plate 7: Cleared area near southern boundary having a frontage to Port Stephens

Plate 8: View of shore of Port Stephens, adjacent to southern boundary.

Plate 9: View of site's northern boundary from Clarke Street. Note that much of this area has been cleared in the past for a house site

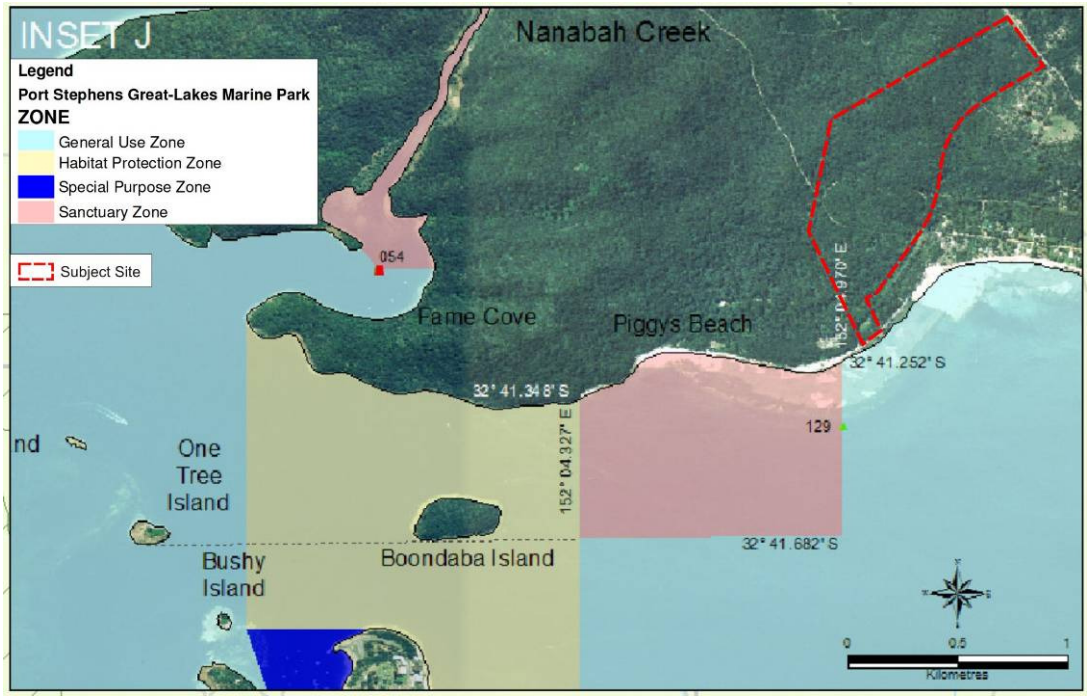
2.3 Land Ownership and Legal Description

The land the subject of this Project Application comprises Lot 2 in DP 1014683 (see Figure 2). The site is owned in its entirety by Richard Halliday, Helen Halliday, Robert Bressan and Andre Bressan.

The waterbody of Port Stephens, into which the proposed development will extend, is owned by the Crown. Accordingly, a license to occupy Crown land will be sought for the Project at the appropriate time. It is noted that a license to occupy Crown land for the purpose of the proposed development has previously been granted, in line with the previous development consent. Also, consent to lodge the Project Application (required to be provided before the determination of the Project, pursuant to Clause 8F of the *Environmental Planning & Assessment Regulation 2000*) is currently being sought and will be provided to DoP.

2.4 Surrounding Development

The Pindimar locality is relatively isolated, accessible via only one main road (Pindimar Road, the southern end of which becomes Clarke Street). The area has a generally rural/ bushland character, with the exception of the small village of Pindimar, divided into discrete southern and northern sections by an area of low-lying land. The Port Stephens- Great Lakes Marine Park is located to the south of the Pindimar area (Port Stephens), and Piggy's Beach is located to the west of the site's south-western boundary. While the area of the Park to the south-west of the site is classed as a 'Sanctuary Zone' under the *Marine Parks Regulation 1999* (as shown in the image below), the area immediately adjacent to the site is zoned 'General Use'. A small area of Fame Cove, located 1.8km to the west of the subject site, comprises part of the Gir-um-bit National Park. Two areas of SEPP 14 wetlands are located to the east (wetland No. 757a) and west (wetland 757b) of the subject site, separated from the site boundaries by approximately 55m and 110m respectively. SEPP 14 wetlands are discussed further in Section 5.8.



The village of South Pindimar, closest to the site, contains a mixture of generally older style 1- 2 storey dwelling houses on standard residential allotments. There is currently no commercial development within the village. All of the land immediately surrounding the subject site is zoned 1(a) Rural under the Great Lakes LEP, with the exception of .the waters of Port Stephens (zoned 7(w) Environment Protection- Waterways under the Port Stephens LEP). The nearby existing residential area of South Pindimar is zoned 2 Village. Surrounding the Village and also zoned 1(a) Rural are a large number of standard residential-sized allotments which were created as part of a historic proposal for Pindimar City (DP 10869 registered in 1920). Most lots have not been developed, with the exception of some clearing, minor structures and camping uses. The zoning of the surrounding area is shown in Figures 4 and 5.

Land immediately to the west of the site comprises heavily vegetated bushland with some scattered small clearings, while land to the north-west comprises somewhat cleared agricultural land. A rural-residential property adjoins the site's north-eastern boundary, and opposite and nearby there are a number of such properties with frontages to Clarke Street. Some land south-east of the site and adjacent to Port Stephens (i.e. lots on the southern side of the unformed Carruthers Avenue), and land to the east of the site, have been partially cleared for camping uses but contain no permanent structures. These lots are separated from the 2 Village Zone and existing residential development in Cambage Street by a small Council reserve and the unformed southern section of Como Street. In the village of South Pindimar, the closest residential development to the subject site is a house on the corner of Como Street and Cambage Street, approximately 220m from the site boundary.

The following photographs show views of nearby development.

Plate 10: View of rural/ residential development adjacent to the subject site's Clarke Street frontage

Plate 11: View of older-style, low-density residential development in Cambage Street. The building to the left is the closest building to the site and is located on the corner of Cambage and Como Streets (Como Street is the current access road connecting Cambage Street, Challis Ave, and the subject site)

Plate 12: View of residential development fronting Port Stephens (Cambage Street)

Plate 13: View of Council Reserve fronting Port Stephens, at the terminus of the unformed Como Street

Plate 14: View of the subject site (in background) looking south-east from the shore adjacent to the Council Reserve

Plate 15: View of vacant & partially cleared lots adjacent to Port Stephens and the south-east boundary of the subject site

3. PROJECT DESCRIPTION

The proposed development comprises a land-based marine aquaculture farm for the production of approximately 60 tonnes per year of live Blacklip Abalone (*Haliotis rubra*). Abalone is a popular food item that is generally high in demand yet undersupplied, with a significantly declining wild population. Blacklip Abalone have been selected as they are indigenous to the local area and are herbivorous, meaning their food requirements are low in protein resulting in less economic expense and few environmental impacts (from waste). This proposal seeks to establish a sustainable commercial farm which will meet consumer demand while reducing pressure on wild Abalone stocks and maintaining the excellent quality of the surrounding environment.

BUILT FORM

The proposed farm will be located in the southern portion of the site and positioned over a development area of approximately 5 hectares (total building footprint is approximately 1 hectare). The proposed site layout is shown in the Development Site Plan and Site Layout Plan below. Due to the topography of the site in this location (sloping down towards Port Stephens) the proposal has been designed to allow for gravitational cascading between the various tanks/ facilities, as appropriate. The development will partly be situated on already-disturbed areas and will incorporate the following land-based facilities (situated throughout 12 main buildings/ structures):

- Cultivation and breeding facilities;
- Water circulation and treatment facilities;
- Water supply pumping and reticulation facilities;
- Retention ponds;
- Outdoor cultivation ponds;
- Waste management and disposal facilities;
- Access roads and an internal road network including visitor car parking areas, staff car parking area, truck parking and loading facilities;
- Administration/ staff amenity building;
- Laboratory, maintenance and workshop facilities;
- Electricity services;
- Landscaping for visual amenity;
- Storage facilities; and
- Fencing and security

The farm will utilise and improve existing access tracks throughout the site to ensure suitability for commercial vehicles and Rural Fire Service vehicles, as required.

In addition, the proposal will include separate intake and outlet pipes, extending from the site into the waters of Port Stephens (Crown land in the LGA of Port Stephens). These pipes will run adjacent to each other at the shore and will be buried underground throughout the intertidal area for aesthetic purposes, before emerging onto bare sand and heading in different directions into the deeper waters of the Port. The outlet pipe will extend approximately 450m into the water while the intake pipe will extend 540m into the water. The '*Location of intake/ outlet pipes within Port Stephens'* is shown in the image below.

Two land-based bores are proposed to be established as part of the proposal, comprising a saltwater bore and a groundwater bore. The precise location of the bores will be demonstrated within the EAR. Groundwater is proposed to be used for occasional landscape irrigation (requirements are expected to be low, due to planned planting of native species); occasional washing down of equipment; and as a back up supply for fire fighting purposes. The saltwater bore is proposed to test access marine-quality water from beneath the freshwater lens, which would be parasite and disease free. This, if suitable, is anticipated to be used as a water supply for the hatchery/broodstock tanks (i.e. the most sensitive life cycle phases of the Abalone) or as an auxiliary supply during extreme wet weather events. However, the potential for use of this water is highly dependant on available composition and supply, and can only be determined after sinking of the bore. The appropriate licenses will be sought from the NSW Office of Water.

The construction of the development will be staged over 3 years, details of which will be provided in the EAR. Further details, plans and elevations will also be provided with the EAR.

CULTIVATION PRACTICES

The farm requires the continuous intake of fresh marine water from Port Stephens for circulation within the Abalone tanks, and the subsequent treatment and return of the water to the Port. Water will be treated at several stages (including settling of sediment and removal of nutrients in retention ponds, etc) to ensure outlet water falls within guidelines. Details of water treatment, both intake and pre-release, will be provided with the EAR.

During the initial stage, a total of 48 Abalone will be collected from selected local wild populations for use as broodstock, with a subsequent 24 collected each year to maintain genetic diversity (subject to licensing from the Department of Primary Industries).

Generally, the Abalone will be reared through the following 3 stages of the life cycle:

- *Larval*- Larvae are collected from the Broodstock tanks (Broodstock Building) and supplied filtered air and water (but no food) for approximately 1 week.
- *Juvenile*- Juveniles are grown in tanks (Juvenile Building or outdoor culture tanks) for approximately 8-12 weeks and fed algae.
- *Growout*- Older Abalone are grown in raceways (Growout Sheds) for approximately 140 weeks and fed specialised manufactured Abalone feed.

Appropriate methodologies with regard to health, security, feeding, waste water disposal, chemical use, disease control and other issues have been extensively researched and developed in consultation with various Government agencies over a number of years in relation to the previous DA

for the proposal. These methodologies have been incorporated into the current Project, and details of such will be provided to support the EAR. It is noted that a number of permits/ licenses will need to be obtained from various government agencies before production can begin, which will be identified in the Draft Statement of Commitments within the EAR.

POST-CULTIVATION

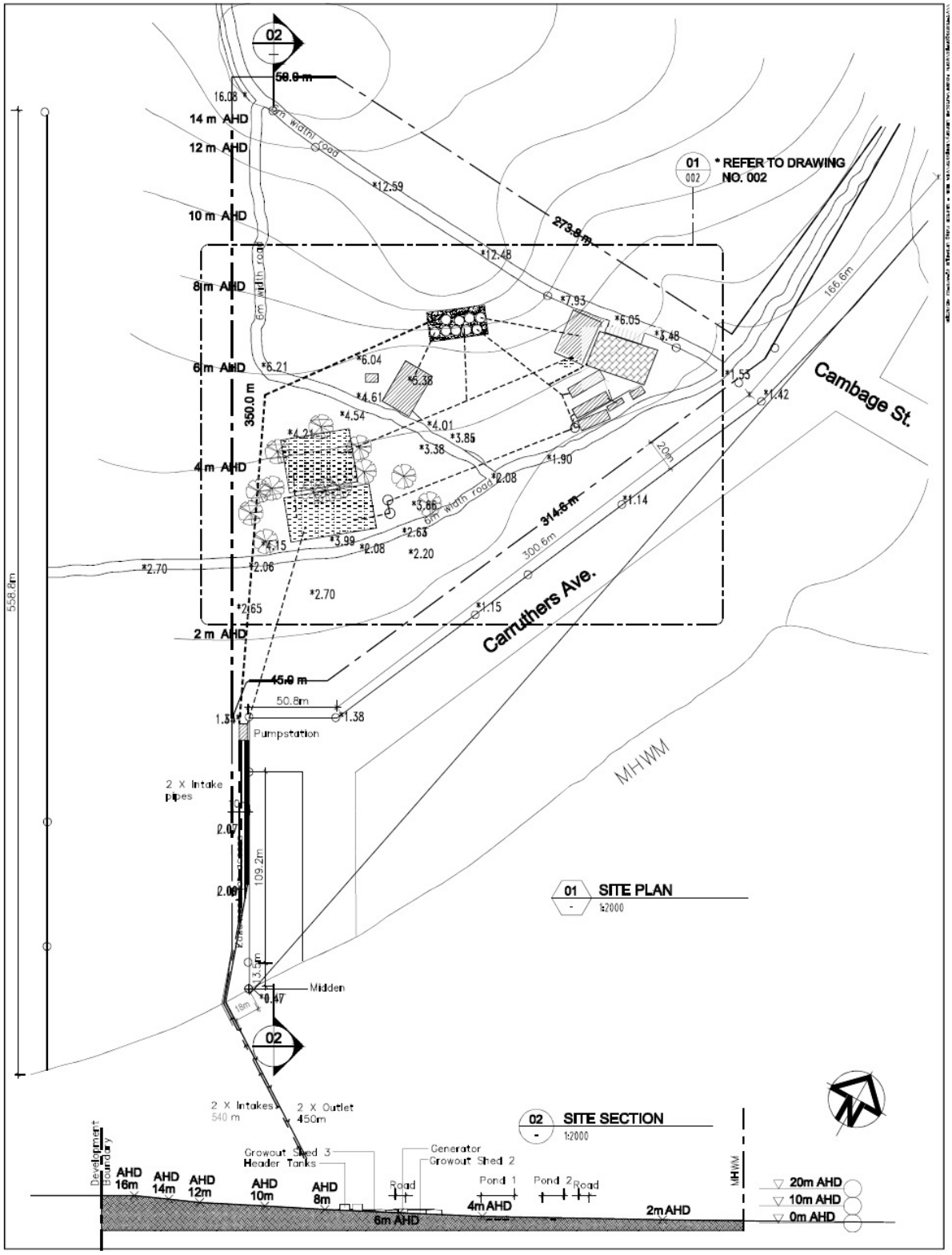
Once Abalone have reached the desired size, individuals will be harvested by hand and placed on transport plates and crates. It is intended that Abalone will be harvested and transported to wholesalers in approximately 1.2 tonne regular shipments (anticipated to be weekly), which can be accommodated in a refrigerated trailer system. Strict quality assurance protocols will be followed, which will be described in detail in the EAR.

ENVIRONMENTAL MANAGEMENT

The site contains a number of significant environmental values, including native vegetation, seagrass meadows in Port Stephens, and proximity to SEPP 14 wetlands. Accordingly, numerous detailed assessments and recommendations have been prepared to ensure the potential for impacts is minimised. The Project's environmental management regime will include the development of a comprehensive Environmental Management Plan for the farm. This Plan will address the management of various relevant issues, including the following:

- Koala Plan of Management
- Bushland Management Plan
- Seagrass Management Plan
- Hollow Tree Management Plan
- Site Rehabilitation Plan (after cessation of production)

It is noted that various areas of the site have been impacted in the past by management activities, including underscrubbing and clearing. The current Project will result in the clearing of a relatively small number of trees throughout the site, predominantly for bushfire hazard reduction purposes (refer to Section 5.17 for further details). However, any areas of the farm site not required for development will be rehabilitated, focussing on removal of weeds, noxious plants and non endemic species.

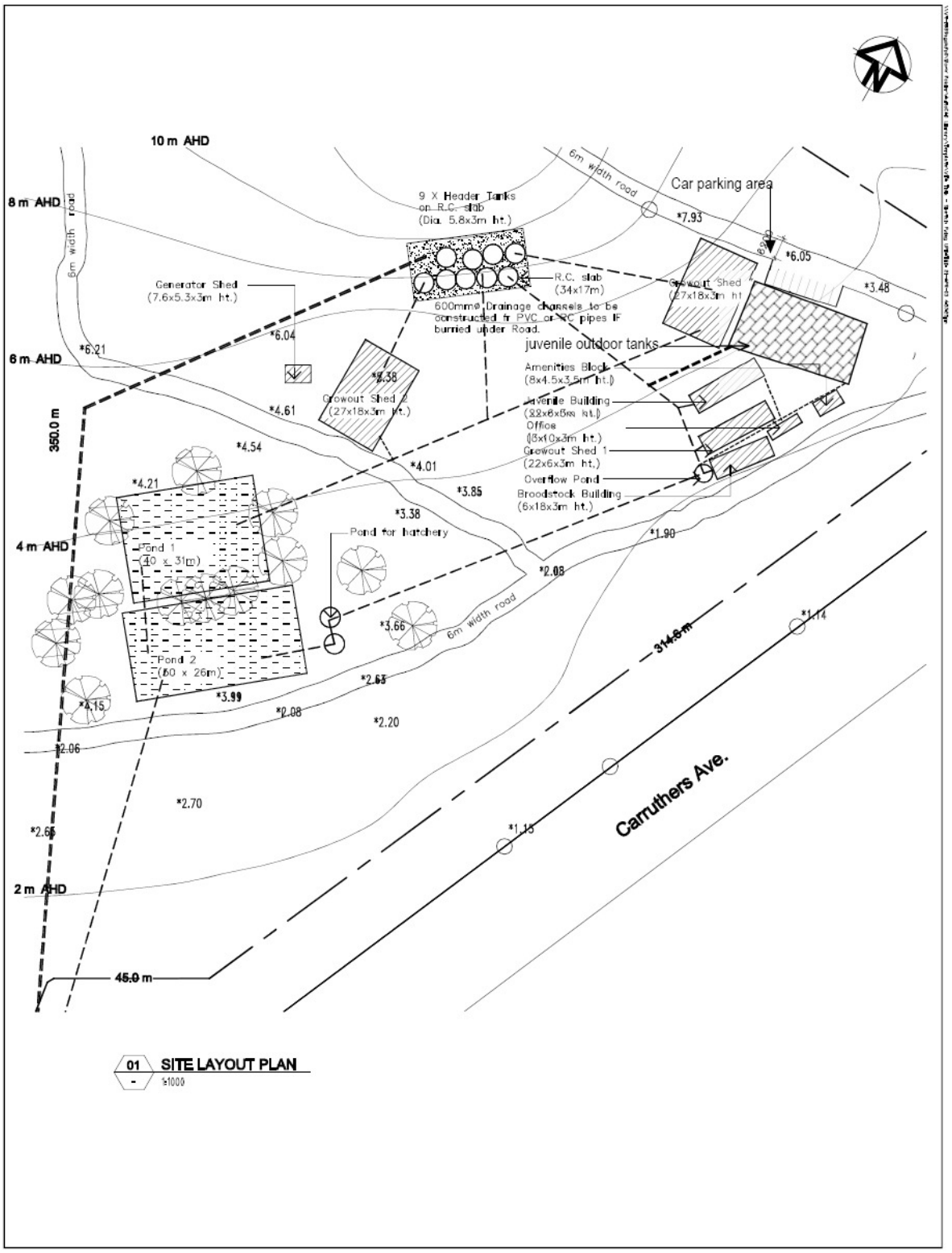


PROPOSED ABALONE AQUACULTURE DEVELOPMENT

DEVELOPMENT SITE PLAN

1:2000

VT ARCHITECTS
DD354 / SK / 001
20 March 2007 D

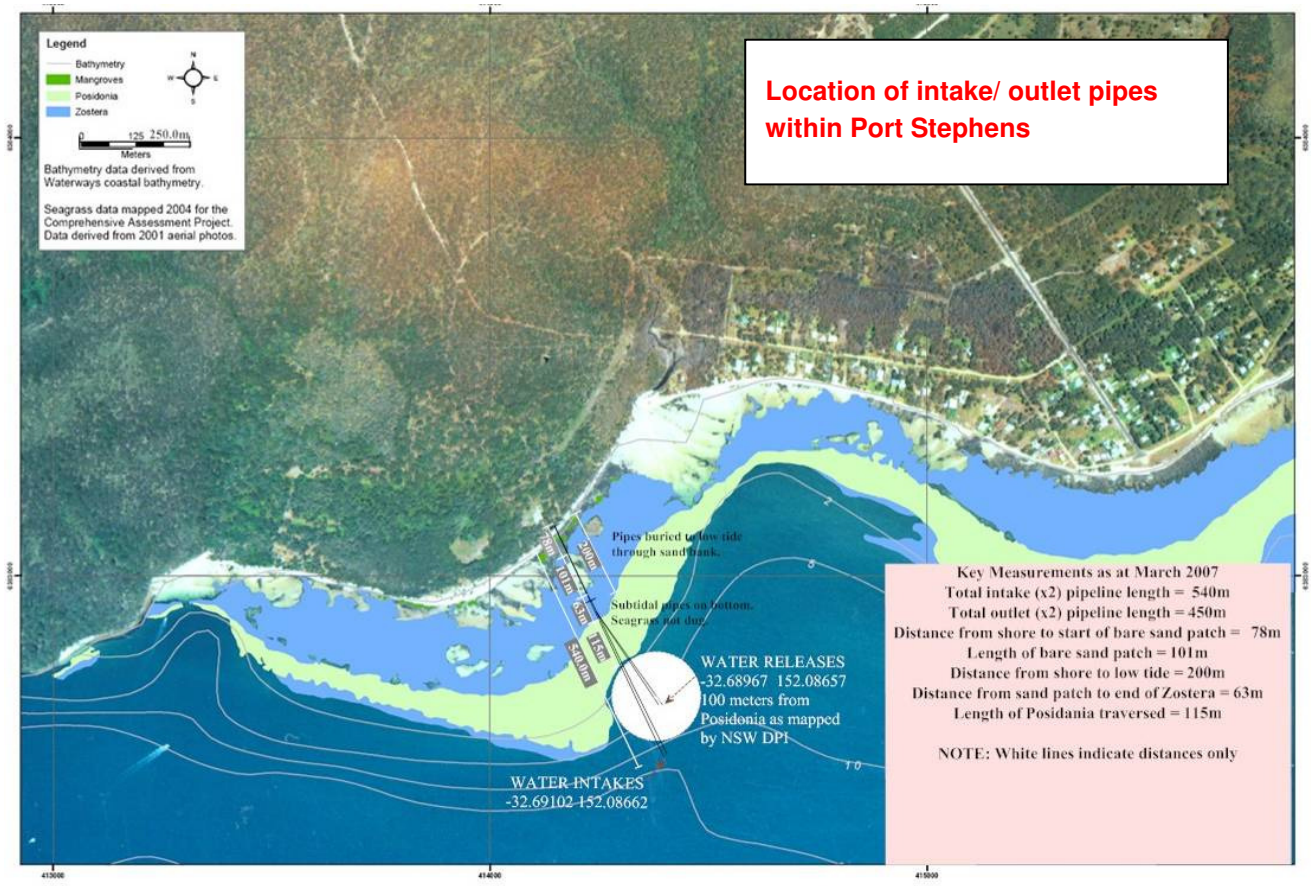


PROPOSED ABALONE AQUACULTURE DEVELOPMENT

DEVELOPMENT
SITE LAYOUT PLAN

1:1000

VT ARCHITECTS
DD354 / SK / 002
20 March 2007 | D



3.1 Justification for Project and Consideration of Alternatives

As discussed in Section 3, Abalone is a highly valued food product that is currently substantially in demand yet undersupplied, both locally and internationally. New South Wales is already a large importer of seafood from around the world. As Australia's and the world's populations continue to increase, so too does the demand for higher living standards and nutritious food.

The world's fisheries are recognised as largely approaching or already exceeding their sustainable harvesting limits. It has been well-established that wild populations of Abalone are in decline, and it is also recognised that the ongoing commercial capture of wild Abalone to supply demand exacerbates that decline. Accordingly, aquaculture must be developed in a sustainable, efficient and profitable way in order to meet increasing demand. The establishment of a sustainable Abalone farm, aimed to be self-sufficient within 4 years, will play a small but important role in supplying demand and relieving pressure on wild populations in the local area.

With regard to this proposal, expressions of interest have already been provided by a Japanese wholesale company interested in purchasing product (refer to Appendix 2), highlighting the well-established demand for ongoing supply of Abalone.

The proposal will result in improved environmental outcomes for the site and surrounding area, due to the proposed ongoing management of the land (e.g. weed management and removal). This management will also result in a significantly reduced bushfire hazard for the site and the village of Pindimar, as discussed in Section 5.10.

A number of permanent full-time, casual and part time jobs will be created from the proposal (up to 30 construction and 15 operational jobs), encompassing broad areas such as administration, electrical, mechanical and hydraulic engineering, and biotechnology. In addition, trainee positions will be created in order to introduce people to aquaculture and to facilitate and encourage further education. Equal opportunity employment will be strongly promoted, with applications invited from all demographics, including those currently under-represented in the workforce (e.g. Aboriginal people, young people).

In addition to employment, there will be flow-on benefits to the local economy through the purchase of construction and operational supplies throughout the farm's lifetime.

With regard to the suitability of the site and the proposed production methods, a large number of alternatives have been explored and disregarded (as discussed in Table 1), resulting in a highly appropriate proposal for the location and the product. It is noted that a number of studies have been undertaken by the Government in recent years in order to identify and assess suitable sites within NSW for land based marine aquaculture. The subject site has been identified as a candidate in at least two of these published studies.

The subject site is considered to be uniquely appropriate for the proposal, with regard to location and environmental considerations, as discussed below. The site's rural character and zoning, combined with its proximity but separation from urban and industrial areas, ensure the farm has access to a suitable supply of labour and materials without creating undesirable impacts on any adjoining landuses. The site is well situated with regard to the regional transport network, allowing for the enhancement of export markets.

The location and topography of the site is ideally suited for aquaculture purposes, due to the gentle slope of the land (allowing for gravity drainage without the need for excessive pumping heights) and access to deep, clean and well-flushed marine waters. The site's unique location, aspect and elevation will provide future surety against rising sealevels and climate change.

In addition, several years of ongoing research and assessment since the submission of the original DA for this proposal (refer to Section 1.1 of this Preliminary EAR), and liaison with Government agencies and independent experts, has further refined the proposal. This is supported by the provision of General Terms of Approval and conditions of consent from all relevant Government agencies, including Great Lakes Council, with regard to the previous DA.

It is noted that the Pindimar area (outside of the village) is characterised by bushland and agricultural activities, which are wholly compatible with the Project, while the proposed development is permissible with consent in the Rural 1(a) zone.

Table 1: Alternatives to the proposal considered

Alternative	Comment
Site locations and layouts	Various locations around New South Wales have been considered for the Project since the mid 1990s. However, as Abalone farming has very specific environmental requirements (e.g. high water quality, direct access to the water etc) no other site was found to reasonably meet requirements. All other potential sites would result in greater environmental impacts than the site chosen (e.g. it is noted that the strip of seagrasses alongside the subject site is relatively thin compared to other areas along the northern portion of Port Stephens, and does not accommodate a significant population of mangroves). The site is eminently suitable due to its separation and screening from residential development, high quality marine environment, topography (allowing for natural cascade of waters downslope), access to middle harbour waters (depth of 15-20m) for appropriate mixing, and good access to regional transport networks.
Species, stocking densities	Blacklip Abalone is indigenous and endemic to Port Stephens- the selection of any other species would have increased the potential risk of competition with the local species, increased risk of disease introduction, and would increase transportation costs associated with collection of broodstock. The stocking densities were selected for the optimal health and growth of the species- higher densities would result in increased disease risk and lower densities would require a larger building footprint.
Cultivation/ post-cultivation procedures	Cultivation procedures (including feeding procedures) were selected on the basis of current best practice- while the feeding/ cultivation/ harvesting procedures are labour-intensive, they are more easily adaptable to changing conditions (i.e. this will result in less environmental impacts that may be associated with unmoderated or over-feeding). Further details of cultivation practices will be provided in the EAR. Alternative post-cultivation measures (such as processing on site) would involve increased waste production and disposal issues, and most likely a larger building footprint.
Transport options	Alternatives to the use of public roads for site access have been considered, including the construction of a jetty to allow boat access; the use of fire trails across private land; and the construction of new access roads across areas containing Potential Acid Sulphate Soils. All of these alternatives are likely to have more pronounced environmental impacts than the use of Challis Avenue, Como Street and Cambage Street. It is noted that use of this road has been supported by GLC and traffic experts in the past, and that projected traffic generation will be very low (refer to Section 5.14).

Alternative	Comment
The 'do nothing' approach	The 'do nothing' approach involves the ongoing management of the site as it currently operates (small agricultural consideration). Apart from the significant financial loss imposed upon the applicant by this option (considering the plethora of research and assessment associated with the previous DA and the current Project), this option is considered undesirable due to the following: • The opportunity for environmental improvements through the ongoing management of the farm and surrounding vegetation (e.g. weeding, vertebrate pest control etc), will be lost. • A small number of trees (otherwise required to be cleared for development) will be retained, however this benefit will be offset by the loss of other environmental improvements discussed above. • The area proposed for the narrow trenching of the intake/outlets will not be disturbed, negating the need to transplant seagrasses in-situ. However this benefit will also be offset by the loss of other environmental improvements discussed above. • The economic benefits to the local community, including the opportunity for local full-time jobs and flow-on financial benefits, will be lost. Export income will also be lost. • The bushfire hazard reduction benefits for the village of South Pindimar, conferred through appropriate management of the site for the Abalone farm, will be lost. • Aquaculture research opportunities will be lost, in addition to the loss of training opportunities for young workers • The projected small increase in traffic to the site will not occur. • The boost to local and international supply of Abalone, from a sustainable farm operation, will be lost. This will likely result in ongoing pressure on wild populations through commercial fishing, and increasing pressure from illegal fishing and theft. Illegal fishing has unquantifiable impacts on the ongoing viability of wild Abalone populations. While aquaculture cannot hope to completely fill demand, it will contribute to 'filling the gap' between wild harvest supply and demand.

4. STATUTORY AND STRATEGIC MATTERS

The legislation, planning instruments and strategic matters relevant to the site and proposal are itemised below. These will be addressed in detail in the EAR, to accompany the Project Application for approval under Part 3A of the Act.

4.1 State and Regional Matters

Under Part 3A of the Act, the Minister is not directly required to take into consideration any environmental planning instruments, development control plans or Section 94 Contributions Plans. However, Table 2 below indicates the state and regional matters which are relevant to the Project and which should be considered in the EAR.

It is noted that a number of permits and licenses will be required to be obtained from various Government agencies before Abalone production can begin (e.g. license to occupy Crown land, permits under the *Fisheries Management Act 1994* etc). Generally these have not been discussed below; however the obtainment of permits will be discussed in detail in the Draft Statement of Commitments to be included in the EAR.

Table 2: Relevant state and regional matters for consideration

State or Regional Matter	Comment
Environment Protection and Biodiversity Conservation Act 1999	The EPBC Act contains provisions for the protection of Matters of National Environmental Significance (MNES). If a development has the potential to impact upon a MNES, the EPBC Act is 'triggered' and the development must be assessed in accordance with this Act (and may also require consent from the Federal Government). The proposal was referred to the Department of the Environment and Heritage in November 2006 to determine if approval was required under this Act. The Department determined that the Project *is not a controlled action…approval is therefore not needed under Part 9 of the Act before the action can proceed* (details of this referral can be provided with the EAR). Accordingly, no further assessment under the EPBC Act is required.
Native Vegetation Act 2003	The Act provides that clearing of native vegetation must not be undertaken without development consent or through the implementation of a Property Vegetation Plan. As the Project will require the removal of a relatively small number of trees, primarily to meet bushfire hazard reduction requirements, this issue will be addressed further in the EAR.
Coastal Protection Act 1979 and NSW Coastal Policy 1997	These pieces of legislation incorporate principles for Ecologically Sustainable Development (ESD) with regard to development in the Coastal zone of NSW. While it is noted that the focus of this Act and Policy are on protection of the environment in response to increased residential development pressure within the Coastal zone, detailed discussion on the principles of ESD will be provided in the EAR.

State or Regional Matter	Comment
State Environmental Planning Policy No. 44- Koala Habitat Protection	This SEPP requires that proposed development must consider potential impacts upon koalas, and must determine if the development site comprises potential or core koala habitat. Previous assessments on the site have indicated the site contains koala habitat and, accordingly, a Koala Plan of Management will be prepared for the development as required (i.e. the preparation of which will be included in the Draft Statement of Commitments in the EAR). It is noted that no koalas have been found within the site during previous fauna surveys. This issue is discussed further in Section 5.17.3 of this Preliminary EAR.
State Environmental Planning Policy No. 62- Sustainable Aquaculture	This SEPP applies to the Project as the site comprises *pond-based and tank based aquaculture* in the LGAs of *Great Lakes* and *Port Stephens*. The SEPP provides that the consent authority for development should take into consideration any relevant aquaculture industry plan, and provides minimum performance criteria for permissible development, operational requirements, and site location requirements. The relevant aquaculture industry development plan (AIDP) is contained within the Hunter & Central Coast Sustainable Aquaculture Strategy, discussed below in this table. The proposal generally satisfies all requirements of the SEPP, including site location requirements- further details will be provided with the EAR.
State Environmental Planning Policy No. 71- Coastal Protection	The site is located within the NSW Coastal Zone and therefore the EAR should consider the provisions of SEPP 71, particularly the Clause 8 matters for consideration and Clauses 14, 15 and 16 (Public Access, Effluent Disposal and Stormwater).
State Environmental Planning Policy (Major Development) 2005	Clause 2 of Schedule 1 of the Major Development SEPP provides that *development for the purpose of aquaculture located in environmentally sensitive areas of State significance* is development to which the SEPP applies. Port Stephens is identified as an environmentally sensitive area of State Significance under the SEPP as it comprises *coastal waters of the State* and *a marine park under the* Marine Parks Act 1997. Accordingly, as the proposed development will extend into these waters, the Project is identified as a Part 3A project and is to be determined by the Minister for Planning. A letter confirming the proposal's Major Project status was provided by the Minister in 2007 and is attached at Appendix 1 of this Preliminary EAR.
Hunter & Central Coast Sustainable Aquaculture Strategy- Land Based Aquaculture	The Strategy aims to provide a focus for facilitating economic development and attracting aquaculture activities to the region. It provides an environmentally sound framework for interfacing the technical provisions of the Aquaculture Industry Development Plan (AIDP- contained within the Strategy) with land use planning, integrated environmental regulatory provisions, and Ecologically Sustainable Development principles. The Project has been designed with regard to the provisions and methodologies of the Strategy and the AIDP in all aspects (including species selection, site selection and planning & design). Further details can be provided with the EAR.

State or Regional Matter	Comment
Marine Parks Act 1997	The Act provides for the declaration and management of marine parks, including the Port Stephens- Great Lakes Marine Park, adjacent to the subject site. Section 19 contains provisions for development in or affecting marine parks, however these provisions only apply to development under Part 4 of the Act and activities under Part 5 of the Act. Therefore, the provisions of the Act are not relevant to the Project (Part 3A).
Marine Parks Regulation 1999	Relevantly, Clause 15 of the Regulation provides that a person must not harm plants or habitat within the General Use zone of a marine park (refer to Section 2.4 of this Preliminary EAR) without consent, and consent must only be granted for the purposes of an ecologically sustainable use. Clause 17 provides that aquaculture is permissible within this zone. The EAR will provide additional information with regard to the Project's ecological sustainability to support a future application for a permit to harm or 'disturb' seagrasses, as discussed previously.
Fisheries Management Act 1994	Relevantly, the Act provides that aquaculture is prohibited without a permit. An application for a permit under this Act will be sought at the appropriate time.

4.2 Local Matters

The table below (Table 3) lists the potential local matters that may be relevant to the proposed development. It is noted that, under Part 3A of the Act, the Minister is not directly required to take into consideration any of the following local matters. However, these matters will be addressed in the EAR as required by the Director-General.

Table 3: Relevant local matters for consideration

Local Matter	Comment
Great Lakes Local Environmental Plan 1996	The subject site is zoned 1(a) Rural under the GL LEP. The proposed development is identified as 'aquaculture' and is permissible with consent in the 1(a) zone. The proposal is generally consistent with all relevant provisions of the GL LEP, including the general aims and objectives of the LEP and the specific objectives of the 1(a) zone. Sufficient assessment has been undertaken to ascertain that there will be no significant detrimental impacts with regard to issues raised within the provisions of the LEP, including the protection of foreshore areas and the protection of coastal lands.
Port Stephens Local Environmental Plan 2000	The area below the Mean High Water Mark of Port Stephens, proposed to accommodate the intake/ outlet pipes, is zoned 7(w) Environment Protection 'w' (Waterways) zone under the PS LEP. The proposed development is identified as 'aquaculture' and is permissible with consent in the 7(w) zone. The proposal is generally consistent with all relevant provisions of the PS LEP, including the general aims and objectives of the LEP and the specific objectives of the 7(w) zone. Sufficient assessment has been undertaken to ascertain there will be no significant detrimental impacts with regards to issues raised within the provisions of

Local Matter	Comment
	the LEP, including development on land with Acid Sulphate Soils and the protection of ecological habitats.
Great Lakes Council Draft Acid Sulphate Soils Development Control Plan No 33	The Acid Sulphate Soils (ASS) map (refer Figure 6) indicates that potential acid sulphate soils are likely to occur on the site, particularly at the boundary with the inter-tidal area. This DCP provides that ASS are considered and appropriately managed with regard to proposed development. The development will involve the excavation of some areas with potential ASS, however appropriate measures will be undertaken to ensure there are no impacts, including the preparation of an ASS Management Plan. See Section 5.14 for further details on this issue.

5. POTENTIAL ENVIRONMENTAL IMPACTS

Listed below are the key constraints or potential impacts anticipated to be associated with the Project. These issued will be addressed further in the EAR, as required. It is noted that significant investigations, assessments and consultation with regard to the proposal have been undertaken in the past, leading to the issuing of a development consent and general terms of approval from all government agencies. This information will be available to support the EAR.

As requested by DoP, these potential impacts have been assessed and classified as having 'low', 'moderate' or 'high' significance. These designations reflect the real or *perceived* likelihood of impacts arising from the proposal, which should be addressed further in the EAR and appropriately mitigated.

5.1 Water Management

5.1.1 Marine Water Intake and Release

The proposal incorporates intake and outlet pipes to transfer water in and out of Port Stephens, as discussed in Section 3. These pipes will be placed alongside each other at the subject site and buried under the surface of the intertidal area, before heading into different directions once reaching deeper water (intake and outlet). Extensive consultation with the former Department of Conservation (DEC) has led to the present design and location of the intake/ outlet pipes, to be positioned approximately 540m and 450m from the Mean High Water Mark respectively. This positioning will ensure the pipes have access to deep water with sufficient vertical mix. Navigational signs may be required to be positioned in this location by the NSW Waterways Authority. Additional information on the consideration of this issue, including the screening of the intake pipes, can be provided to support the EAR.

The proposal also involves the sinking of a saltwater bore within the subject site to potentially access disease and parasite-free marine water as an auxiliary or broodstock water supply (refer to Section 3 for further details). This water use will only occur if the availability and consistency of the water is considered appropriate, and will be subject to the obtainment of a license from the NSW Office of Water (formerly the Department of Water & Energy). Further discussion on this issue can be provided within the EAR.

Significance: Moderate

5.1.2 Water Quality and Quantity

The primary matters of concern with regard to water quality and quantity are seepage of salt water from the retention ponds into the water table; the impact of the return of waste water from the Abalone farm into Port Stephens; and impacts of stormwater runoff to Port Stephens. Seepage into the water table is discussed in Section 5.1.3 below.

As discussed in Section 5.1.1 above, the proposed intake/outlet pipes will be positioned in deep water to allow sufficient vertical mix and dispersion of waste water. Waste water will be appropriately treated before release into the waterway, ensuring that nutrient levels will not be in excess of Departmental

guidelines. The operation of the farm requires minimal use of chemicals (e.g. pH buffer, oxygen bleach etc) which will be appropriately stored and disposed of without impacting upon water quality. Details of chemical storage and use will be provided in the EAR.

As part of the previous DA and in consultation with the former DEC, Department of Natural Resources (DNR) and GLC, the proponent proposed to undertake a comprehensive water quality monitoring regime encompassing a raft of parameters, including water quality, water table levels and monitoring of analytes. This monitoring regime is proposed as part of the current Project to ensure maintenance of water quality, and is expected to be regulated by the Department of Environment, Climate Change and Water (DECCW) as part of ongoing license and permit restrictions. Further details will be provided within the EAR.

The Project is not likely to lead to any detrimental impacts on the receiving waters of Port Stephens through stormwater runoff, as stormwater will be appropriately managed as part of the development. A Stormwater Management Plan will be prepared to support the EAR as required.

It should be noted that the DNR issued General Terms of Approval for the proposed development as part of the previous DA.

Significance: High

5.1.3 Ground Water Use and Contamination

The site is located above an unconfined aquifer which is spilt between fractured rock and coastal sands groundwater resources. Advice from the NSW Office of Water indicates these groundwater sources are currently exempt from the *Lower North Coast Unregulated and Alluvial Water Sources*, and any proposal to sink a bore or utilise this groundwater must be accompanied by an application to the NSW Office of Water under Sections 112 and 113 of the *Water Act 1912.* As discussed in Section 3, the proposal incorporates the sinking of a single groundwater bore to access water for fire fighting and other occasional uses. There are not expected to be any significant impacts associated with this groundwater use. Further details on this issue can be provided in the EAR.

As discussed in Section 3 of this Preliminary EAR, the Project will utilise the existing sloping topography to create a gravity fed aquaculture system, and proposed structures will be generally located above the water table. All ponds will be constructed to ensure there is no seepage of water/ contaminants into the soil or water table, and the water table and ponds will be regularly tested for quality as part of the overall water quality monitoring scheme, discussed in Section 5.1.2 above.

GLC has confirmed in its Council Report for the previous DA that *Council staff are satisfied that appropriate consideration has been given to potential water table contamination within the application*. Additional information on the consideration of this issue can be provided to support the EAR.

Significance: Low

5.2 Heritage and Archaeology

As part of the previous DA, an Aboriginal Heritage Assessment was undertaken for the proposed development, attended by a representative of the Worimi Local Aboriginal Land Council (LALC). The Assessment identified the edge of an Aboriginal shell midden on the beach near the site's southern boundary, as shown on the Ecological Constraints Map- Land Based at Figure 7. The proposed intake/outlet pipes will need to cross near this midden in order to reach the water.

In order to protect the midden, the proposed pipes will be diverted to the west of the midden (at a distance of approximately 18m from the site boundary) and lain underground at the shoreline to reduce impacts on visual amenity. The trench for the pipes at this location will be dug under the supervision of a representative of the Worimi Land Council. Archaeology consultants will be engaged to map the best position of the pipe before construction, in addition to the implementation of other measures to protect the midden before/ during construction (e.g. fencing of midden etc). Extensive assessment and consultation has been undertaken to date with the former DEC, GLC, and the Worimi and Karuah LALCs to ensure the best result for protection of this heritage item. Details of this previous consultation/ assessment can be provided to support the EAR. Accordingly, apart from the mapping, overseeing and protection measures proposed, no additional assessment is considered necessary.

It is noted that no other European or Aboriginal heritage items have been identified in the vicinity of the site.

Significance: Low

5.3 Odour

The Project is concerned with the production of live Abalone for transport, and will not produce significant amounts of organic waste. The only organic waste produced will comprise pond sludge from retention ponds, which will be disposed of according to relevant guidelines. All feed will be kept in sealed buildings. Accordingly, the proposal will not produce any significant odours, such as may be expected from a farm dealing with the slaughtering and processing of animals.

Significance: Low

5.4 Soil Stability

The Project will involve only limited earthworks to accommodate development, with the greatest amount of earthworks associated with the narrow trenching of pipes in the inter-tidal area. As discussed in Section 5.14, this trenching will be undertaken quickly and in accordance with Department of Agriculture recommendations to prevent the acidification of soils. Any soil removed for excavation on land will be retained and re-used on site, and only a small amount of clean fill will be required to be imported into the site for development, if required.

Details of proposed soil erosion and sediment control measures will be provided with the EAR.

Significance: Low

5.5 Context, Setting and Visual Amenity

The proposed development will be significantly set back from the Port Stephens foreshore and the village of South Pindimar, and is screened by vegetation, ensuring that development will predominantly not be visible outside of the site.

Accordingly, the existing scenic amenity will be maintained and additional assessment with regard to this issue is not considered necessary.

Significance: Low

5.6 Abalone Disease Control

Several diseases have been associated with Abalone, the most relevant being *Perkinsus olseni*- a protistan parasite often associated with Blacklip Abalone. With regard to the previous DA, a number of comprehensive measures were proposed to prevent and combat any outbreaks of disease within the farm, which will be utilised for the current Project. These measures include the appropriate treatment of water and regular health inspections, the details of which will be provided to support the EAR. It is noted that the former DEC, DPI and DNR provided general terms of approval for the former DA, incorporating requirements for the ongoing monitoring of stock health, incidents of disease and monitoring of discharge into the waterway, which will be incorporated into the current Project. In any case where diseased stock is identified, it is anticipated that diagnosis and disposal will be undertaken by the DPI, as suggested for the previous DA.

While it is understood that the risk of disease transmission from the farm to wild stock is a significant issue of concern for some members of the public, it is noted that expert opinions and research can be provided to support the EAR, indicating that there have been no incidents of transfer of this disease from existing Abalone farms into wild populations and that the risk of farm stock being infected from wild populations is not large. Importantly, the disease is already known to be present in the wild populations surrounding the subject site and the highest risk to Abalone is thought to occur when infected animals are stressed or the disease is introduced into a new population that has not become adapted to the disease or stressors. The transfer of disease from the farm into wild populations is therefore considered highly unlikely.

It should also be noted that an Abalone hatchery at Tomaree Head research facility has been managed by the Department of Primary Industries (NSW Fisheries) for more than a decade and has been proven to be both free of the disease and detrimental water quality impacts upon surrounding waters.

Significance: Moderate

5.7 Reduction in Wild Abalone Populations

The proposal involves the obtainment of 48 wild Abalone for broodstock, and the subsequent obtainment of 24 per year for the purpose of maintaining the genetic diversity of the farmed population. This would be regulated through the provision of licenses from the DPI and any associated conditions, and would involve the quarantine of any wild stock before release into the farm. The broodstock are anticipated to be sourced from appropriate local sites. Due to the small

numbers of animals to be collected (particularly when compared to wild capture numbers for commercial sale), and the appropriate selection of harvest locations, the collection of broodstock is not likely to exacerbate the decline of wild Abalone. The production of farmed Abalone is in fact expected to reduce demand on commercial fishing of these species from wild populations.

As discussed above, the Project is not likely to impact upon the populations of wild Abalone through the release of diseases. Accordingly, the proposal is not considered likely to detrimentally impact upon wild Abalone populations.

Significance: Low

5.8 SEPP 14 Wetlands

Two wetlands, listed under *State Environmental Planning Policy No. 14- Coastal Wetlands*, are located to the east (wetland No. 757a) and west (wetland 757b) of the subject site, separated from the site boundaries by approximately 55m and 110m respectively (refer to the Ecological Constraints Map- Land Based at Figure 7). Although the development is not proposed within the wetland area (the nearest structure is approximately 70m away from the wetlands), the development area is a small part of the wetland catchment. Therefore a number of recommendations have been made for the previous proposal to ensure protection of the wetlands (including retention of a vegetated buffer area, appropriate sedimentation/ erosion control measures are implemented etc), which will be incorporated into the current Project. Details of the assessment under SEPP 14 and mitigation measures will be provided within the EAR.

Significance: Low

5.9 Waste

As the farm will not incorporate any processing of Abalone, the only likely waste product from production is pond sludge from retention ponds. This sludge will likely be disposed of at Port Stephens waste facility. Waste water will be disposed of via an on-site treatment system (refer to Section 5.12) and general domestic garbage will be disposed of at the Council landfill. Details of garbage disposal methods can be provided to support the EAR.

Significance: Low

5.10 Bushfire

The subject site is located within a bushfire prone area. To address this issue, a Bushfire Assessment was prepared for the previous DA. This Assessment made a number of recommendations, which were supported and reinforced by GLC and approval conditions developed by the NSW Rural Fire Service (RFS). These recommendations/ conditions included access road width requirements, the provision of a dedicated water supply tank and pump, and the implementation and management of Asset Protection Zones. It is noted that the management of the site for bushfire hazard reduction will confer hazard reduction benefits on the nearby village of South Pindimar.

The Bushfire Assessment and additional information will be provided to support the EAR.

Significance: Moderate

5.11 Landscaping

While the proposed development will predominantly not be visible outside of the subject site (refer to Section 5.5), it is considered important to accurately plan and document the proposed landscaping treatment of the site. Accordingly, a Landscaping Plan will be submitted with the EAR, detailing features such as the location and screening of garbage areas, details of asset protection zones and effluent disposal areas, and the location of driveways, parking areas and other impervious areas. It is anticipated that garden areas will be vegetated by predominantly native species.

Significance: Low

5.12 Utilities and Infrastructure

Both power and telephone services are currently available to the site, and these are able to be extended to the proposed development.

Currently, no reticulated water or sewer services are available on site, and fresh water will need to be collected via rainwater tanks. Due to the relatively small number of people proposed to utilise the site, it is proposed that effluent from the proposed administration/ amenities building can be disposed of on-site. Accordingly, the only additional assessment/ approvals required with regard to servicing are likely to be the submission and obtainment of an approval from Great Lakes Council (GLC) for on-site effluent disposal, prior to the issuing of a Construction Certificate. GLC has supported this position in its Council Report for the previously submitted DA.

Significance: Low

5.13 Social and Economic

The proposed development is expected to generate approximately 15 full-time equivalent operational jobs and 30 construction jobs, and is likely to have substantial flow-on economic benefits to local and regional businesses through the purchasing of hardware, equipment etc. The farm will be important for aquaculture research and will provide training and an introduction to aquaculture for young workers, while encouraging and promoting further education. A broad range of employment opportunities will be offered, from administration to engineering and biotechnology. There will be a strong emphasis on equal opportunity employment, with applications for work encouraged from all demographics, including those currently under-represented in the workforce (e.g. Aboriginal people, young people).

The development is not likely to have any substantial impact on local property values or quality of life for local residents, due to the significant separation of the development from residential development and the relatively low amounts of traffic entering the site, as discussed throughout this Preliminary EAR. There is not expected to be any significant costs involved with the augmentation of infrastructure to the site, with the exception of the provision of telephone lines.

Accordingly, the short-term environmental impacts of the site (associated with the limited clearing and construction activities) are expected to be outweighed by the long-term social and economic benefits.

Significance: Low

5.14 Traffic and Access

The site is proposed to be accessed from Challis Ave (refer to Figure 1). This road is currently unformed and is accessible from Como Street (also predominantly unformed, with some gravel areas) and Cambage Street (sealed). Access is not proposed directly from Cambage Street as this would involve crossing a SEPP 14 wetland. The proposed access from Challis Avenue is likely to require upgrading of the road to ensure suitability for commercial vehicles and Rural Fire Service vehicles. Details can be provided within the EAR.

As discussed throughout this Preliminary EAR, the proposal is likely to involve the once-weekly transport of live Abalone from the farm, the full-time operational employment of approximately 15 people, and the occasional delivery of materials or supplies. Accordingly, the traffic generated from the proposal is expected to be relatively low. An assessment of parking and traffic impacts can be provided to support the EAR.

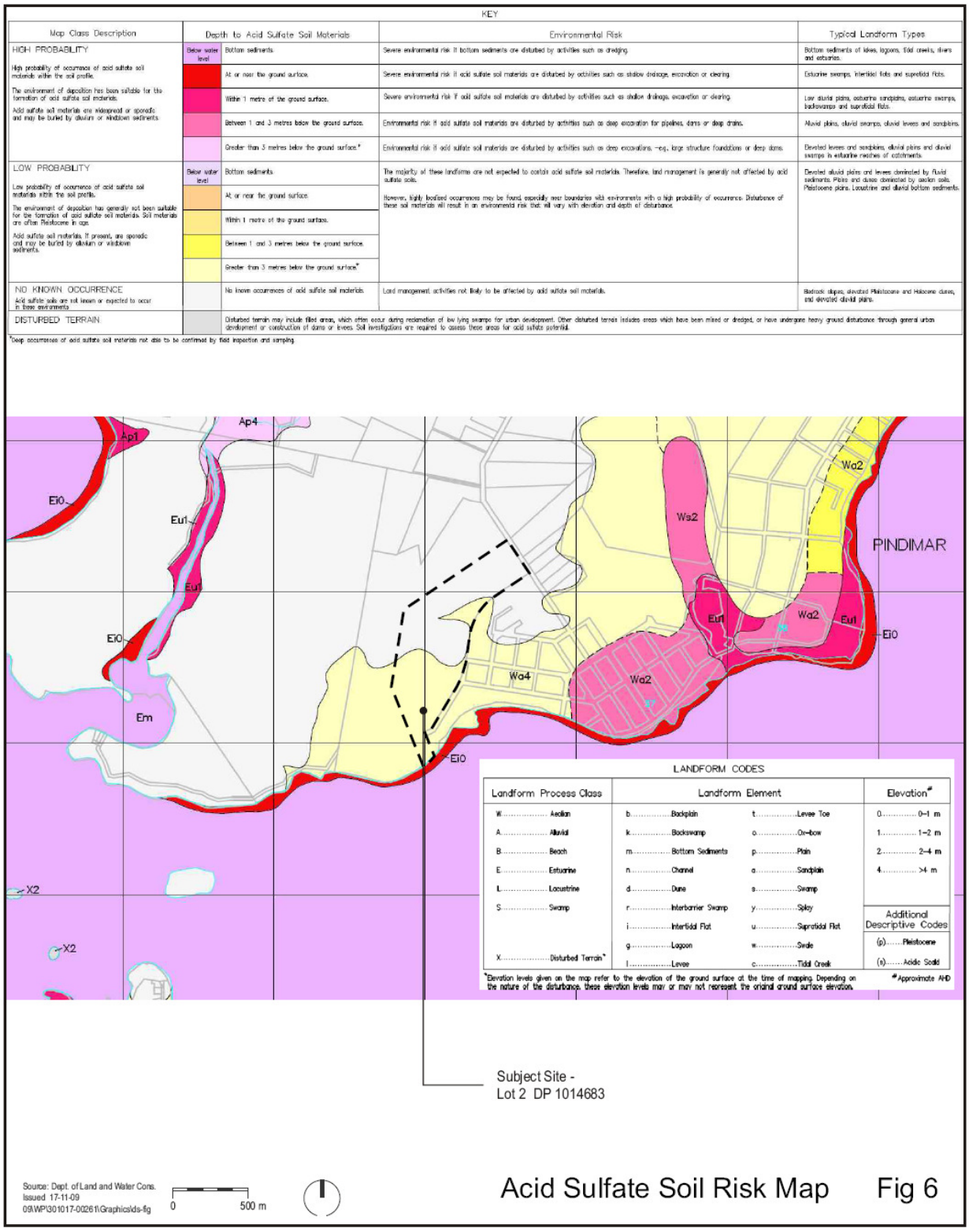
Significance: Low

5.15 Potential Acid Sulphate Soils

The site is identified on the Acid Sulphate Soil Risk Map (Department of Land & Water Conservation) as having between a nil and low probability of acid sulphate soils occurring on land, as shown on Figure 6. The area of low probability is predominantly restricted to the southern portions of the site, and the depth to acid sulphate soil materials is estimated at greater than 3m below the soil's surface. The map indicates that *the majority of these landforms are not expected to contain acid sulphate soil materials; therefore land management is generally not affected by acid sulphate soils.* While highly localised occurrences may be found, these occurrences are most likely to occur near areas with a high probability of occurrence.

However, an area of high probability is located along the shore of Port Stephens. Accordingly, soil tests were undertaken, and while ASS were not found to occur within the proposed excavation depth of the pipes, an Acid Sulphate Soil Management Plan was prepared. This Plan includes methods to ensure ASS do not occur (e.g. lining of trench, prompt filling to avoid exposure to air and subsequent acidification etc). This Plan will be provided to support the EAR.

Significance: Low


KEY
Map Class Description
Depth to Acid Sulfate Soil Materials
Environmental Risk
Typical Landform Types
HIGH PROBABILITY
High probability of occurrence of acid sulfate soil materials within the soil profile.
The environment of deposition has been suitable for the formation of acid sulfate soil materials.
Acid sulfate soil materials are widespread or sporadic and may be buried by alluvium or windblown sediments.
Below water level
Bottom sediments.
Severe environmental risk if bottom sediments are disturbed by activities such as dredging.
Bottom sediments of lakes, lagoons, tidal creeks, rivers and estuaries.
At or near the ground surface.
Severe environmental risk if acid sulfate soil materials are disturbed by activities such as shallow drainage, excavation or clearing.
Estuarine swamps, intertidal flats and supratidal flats.
Within 1 metre of the ground surface.
Severe environmental risk if acid sulfate soil materials are disturbed by activities such as shallow drainage, excavation or clearing.
Low alluvial plains, estuarine sandplains, estuarine swamps, backswamps and supratidal flats.
Between 1 and 3 metres below the ground surface.
Environmental risk if acid sulfate soil materials are disturbed by activities such as deep excavation for pipelines, dams or deep drains.
Alluvial plains, alluvial swamps, alluvial levees and sandplains.
Greater than 3 metres below the ground surface.*
Environmental risk if acid sulfate soil materials are disturbed by activities such as deep excavations, –eg., large structure foundations or deep dams.
Elevated levees and sandplains, alluvial plains and alluvial swamps in estuarine reaches of catchments.
LOW PROBABILITY
Low probability of occurrence of acid sulfate soil materials within the soil profile.
The environment of deposition has generally not been suitable for the formation of acid sulfate soil materials. Soil materials are often Pleistocene in age.
Acid sulfate soil materials, if present, are sporadic and may be buried by alluvium or windblown sediments.
Below water level
Bottom sediments.
At or near the ground surface.
Within 1 metre of the ground surface.
Between 1 and 3 metres below the ground surface.
Greater than 3 metres below the ground surface.*
The majority of these landforms are not expected to contain acid sulfate soil materials. Therefore, land management is generally not affected by acid sulfate soils.
However, highly localised occurrences may be found, especially near boundaries with environments with a high probability of occurrence. Disturbance of these soil materials will result in an environmental risk that will vary with elevation and depth of disturbance.
Elevated alluvial plains and levees dominated by fluvial sediments. Plains and dunes dominated by aeolian soils. Pleistocene plains. Lacustrine and alluvial bottom sediments.
NO KNOWN OCCURRENCE
Acid sulfate soils are not known or expected to occur in these environments
No known occurrences of acid sulfate soil materials.
Land management activities not likely to be affected by acid sulfate soil materials.
Bedrock slopes, elevated Pleistocene and Holocene dunes, and elevated alluvial plains.
DISTURBED TERRAIN
Disturbed terrain may include filled areas, which often occur during reclamation of low lying swamps for urban development. Other disturbed terrain includes areas which have been mixed or dredged, or have undergone heavy ground disturbance through general urban development or construction of dams or levees. Soil investigations are required to assess these areas for acid sulfate potential.
*Deep occurrences of acid sulfate soil materials not able to be confirmed by field inspection and sampling.
Ap4
Ap1
Ei0
Eu1
Wa2
PINDIMAR
Em
Wa4
X2
LANDFORM CODES
Landform Process Class
W Aeolian
A Alluvial
B Beach
E Estuarine
L Lacustrine
S Swamp
X Disturbed Terrain*
Landform Element
b Backplain
k Backswamp
m Bottom Sediments
n Channel
d Dune
r Interbarrier Swamp
i Intertidal Flat
g Lagoon
l Levee
t Levee Toe
o Ox-bow
p Plain
a Sandplain
s Swamp
y Spky
u Supratidal Flat
w Swale
c Tidal Creek
Elevation#
0 0–1 m
1 1–2 m
2 2–4 m
4 >4 m
Additional Descriptive Codes
(p) Pleistocene
(s) Acidic Soild
*Elevation levels given on the map refer to the elevation of the ground surface at the time of mapping. Depending on the nature of the disturbance, these elevation levels may or may not represent the original ground surface elevation.
#Approximate AHD
Subject Site -
Lot 2 DP 1014683
Source: Dept. of Land and Water Cons.
Issued 17-11-09
09\WP\301017-00261\Graphics\ds-fig
0
500 m
Acid Sulfate Soil Risk Map
Fig 6

5.16 Noise

As part of the previous DA, a Noise Assessment was prepared to assess likely impacts of the proposal, particularly with regard to operational noise, traffic noise and construction noise. Operational noise would predominantly be derived from the 24 hour operation of pumping systems (though this is partially negated through the placement of pumps in lined, partly underground bunkers). The results of the Assessment indicated that the proposed development will be below the desired noise level and will not create any undue disturbance to nearby residential properties. It is noted that the closest dwelling house to the proposed development is located approximately 320m away.

Road traffic and construction noise results also meet design goals for both day and night and construction noise levels. Details of the Noise Assessment will be provided to support the EAR. It is noted that the former DEC incorporated noise and related operating restrictions in their general terms of approval, which were supported by GLC and will be incorporated into the current Project.

Significance: Low

5.17 Flora and Fauna

5.17.1 Native Vegetation and Endangered Ecological Community

Wildthing Environmental Consultants prepared an Updated Vegetation Mapping Report in November 2008, which involved the survey and mapping of vegetation communities within the site. This assessment identified 10 vegetation communities, as follows (also refer to the Ecological Constraints Map- Land Based at Figure 7). One vegetation community, Swamp Mahogany/ Paperbark is considered to be an Endangered Ecological Community (EEC).

- Swamp Mahogany- Paperbark Forest (7.4ha)
- Smooth-barked Apple Swamp Forest (0.7ha)
- Coastal Sand Blackbutt Open Forest (3.4ha)
- Blackbutt/ Tallowwood Open Forest (2.2ha)
- Ironbark/ Tallowwood Open Forest (8.3ha)
- Grey Gum/ Tallowwood/ Ironbark (4.5ha)
- Spotted Gum/ Ironbark Forest ((2.9ha)
- Smooth-barked Apple/ Stringybark Open Forest (22.2ha)
- Moist Riparian Forest (1.1ha)
- Cleared Modified (5 areas within site)

The proposed development will be sited partially within the existing cleared modified areas, and will involve the clearing of a relatively small number of trees. Trees will be retained wherever possible within the development footprint. No trees will be removed to accommodate the pipeline as the pipe is flexible and can be positioned strategically around vegetation. The major portion of all proposed

clearing is associated with bushfire hazard reduction measures recommended by the RFS. The preparation of a Property Vegetation Plan is likely to be required under the *Native Vegetation Act 2003* for any clearing of remnant native vegetation. Full details of any vegetation clearing can be provided with the EAR.

It is noted that no parts of the Swamp Mahogany/ Paperbark Forest are proposed to be cleared for the development footprint, however it is likely to be managed as part of the bushfire Asset Protection Zone. Accordingly, appropriate assessment with regards to this issue will be provided in the EAR.

A number of hollow bearing trees are located within the subject site. These trees will be appropriately assessed and a Hollow Tree Management Plan prepared as required, in order to maintain appropriate habitat for fauna.

Significance: Moderate

5.17.2 Threatened Species

A Statement of Effect on Threatened Flora and Fauna was produced for the previous DA (Wildthing, July 2002) which examined the approximately 5 hectare site around the development area. This Statement directly identified 2 threatened fauna species within the site, as follows:

- Little Bentwing-bat (*Miniopterus australis)*, and
- Grey-headed Flying Fox (*Pteropus poliocephalus*

Indications of koala presence were also found on site; although no individuals have been sited (impacts on koalas are discussed in Section 5.17.3 below). No indication of the presence of threatened floral species was found.

It was determined that, given the absence of suitable roosting habitat within the site, the 2 identified species were most likely to be utilising the site for hunting/ foraging. Due to the proposed retention of the majority of all vegetation/ habitat on site, among other factors, it was *considered unlikely that the proposal would place the local population of this species at risk of extinction.* Regardless, recommendations were made to enhance habitat values for these species (e.g. planting suitable forage species) which will be incorporated into the Project. Further details on this issue will be provided in the EAR.

It is noted that the former Department of Environment and Conservation issued General Terms of Approval for the proposed development in respect of the previous DA.

Significance: Low

5.17.3 Koala Habitat

'Potential Koala habitat', as defined under SEPP 44, occurs over the entire 5 hectare development area due to the presence of koala feed trees. While no koalas were directly identified as part of the Statement of Effect on Threatened Flora and Fauna (see Section 5.17.2), and the site does not constitute 'Core Koala habitat', evidence suggests at least one koala has used the area over a period of time. In order to ensure protection of koalas, a number of measures (e.g. appropriate fencing etc) will be implemented as part of the development. A Koala Plan of Management will be prepared as

part of the proposed Environmental Management Plan (refer to Section 3). Additional details will be provided with the EAR.

Significance: Low

5.17.4 Seagrasses and Mangroves

The Statement of Effect on Threatened Species for the previous DA identified three aquatic vegetation communities along the proposed pipeline route, as follows*:*

- Grey Mangrove (*Avicennia marina* var. *australasica);*
- Zostera (seagrass) (*Zostera capricorni); and*
- Posidonia (seagrass) (*Posidonia australis).*

The location of these species is shown in the *Location of intake/outlet pipes within Port Stephens* image in Section 3.

The main issues of concern related to impacts of the development relate to the direct disturbance of seagrasses through the placement and narrow trenching of the pipeline; increased turbidity; and potential increases in nutrients in surrounding waters. Previous assessments undertaken (details to be provided within the EAR as required) indicated that the change in nutrient levels is expected to be negligible and in accordance with ANZEEC Guidelines. The potential for turbidity impacts was also assessed for the previous DA, and the former DEC considered that the lengthening of the pipelines (to the currently proposed length) is likely to negate any impacts (i.e. the outlet of the pipe is approximately 100m from Posidonia meadows as mapped by NSW DPI). As discussed in Section 5.1.2, the proposed water quality monitoring regime will also measure turbidity impacts.

With regard to direct disturbance of seagrasses through trenching (i.e. for approximately the first 200m of the pipe's length, through the intertidal area), it is proposed that seagrass 'cores' will be removed, trenches quickly dug, and the seagrass cores immediately replaced over the filled-in trench (i.e. replanting in-situ). Research has indicated that this method demonstrates the highest potential for successful re-establishment. It is noted that the removal/ disturbance of any seagrass population requires the approval of NSW DPI, and DPI issued general terms of approval in this regard for the previous DA.

It is noted that the proposal is not expected to result in the removal of any mature mangrove specimens. There is likely to be some disturbance of a small amount of mangrove seedlings in the small area proposed to be trenched, however these impacts are not likely to be significant with regard to the viability of the existing mangrove population. Further details will be provided in the EAR.

Significance: Moderate

5.18 Flooding

Parts of the subject site are subject to 1:100 year flooding. However, the only portions of the proposed development to be located below the 1:100 year flood level are the proposed intake/ outlet pipes and the pumphouse, which is to be located in a partly underground bunker. A back-up pump will be available for use if the proposed pump-house is affected by flood waters. All other development will be located higher up the slope. Accordingly, flooding is not considered a significant risk for the proposal.

Significance: Low

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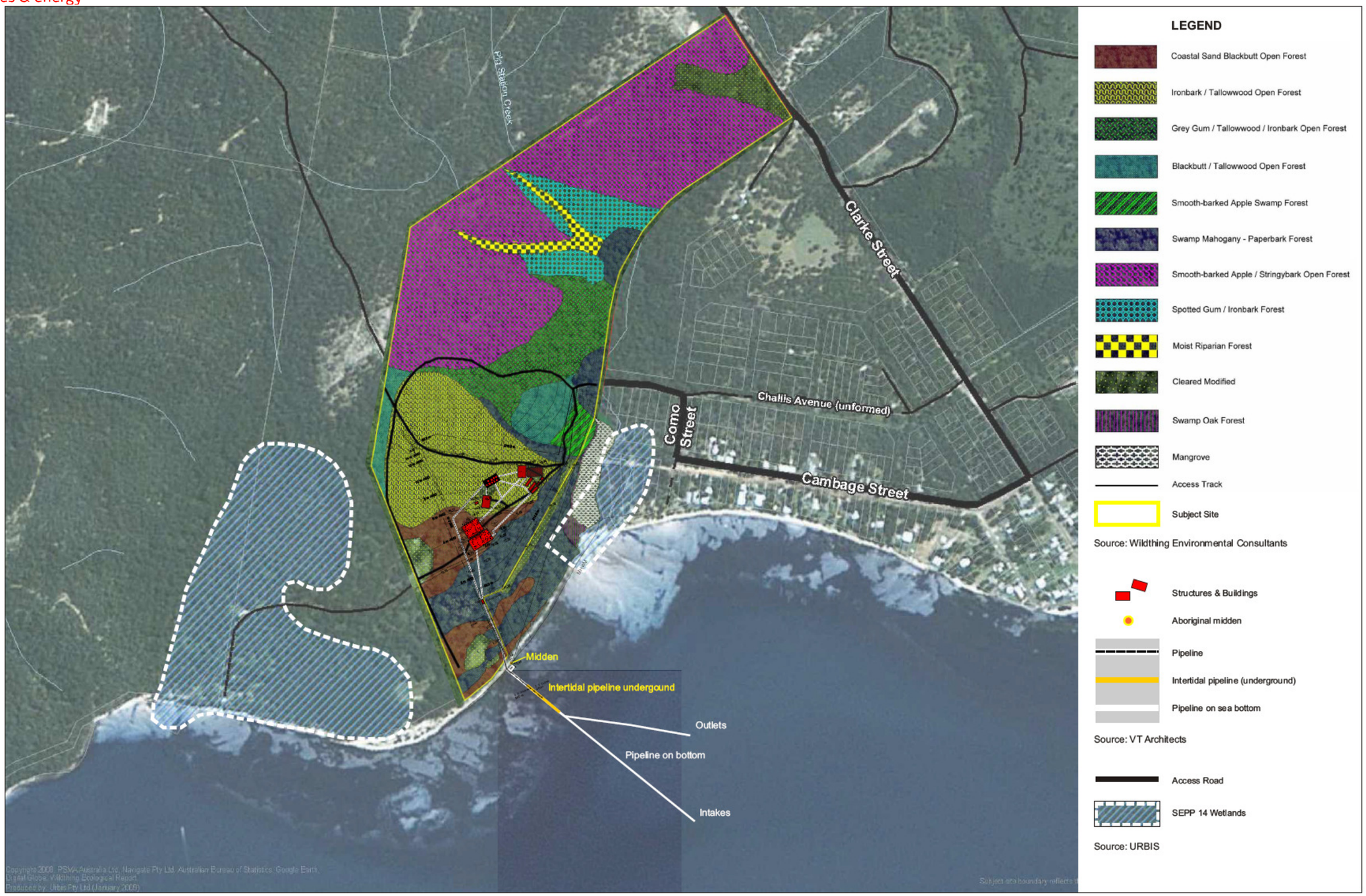

WorleyParsons
resources & energy
Incorporating **Planning Workshop Australia**

EcoNomics

Base source: Urbis - Jan 2009
File Identity: 09\WP\301017-00261\Graphics\ds-Con
Date Modified: 15 Oct 09

0 100 m

Pindimar
Proposed Abalone Aquaculture Development
Ecological Constraints Map - Land Based

FIGURE 7

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6. CONSULTATION

Extensive consultation with regard to the Project has been undertaken in the past, in relation to the previous DA. The consulted stakeholders include those listed below, in addition to the several public exhibition phases undertaken for the previous DA. Feedback from the consultation led to some refinements of the proposal to more rigorously manage potential environmental impacts. Additional updated consultation with regard to the current, similar Project (which remains predominantly unchanged from the previous, with the exception of minor amendments, including production rates) will be undertaken as required.

- Port Stephens Council
- Great Lakes Council
- Port Stephens and Myall Lakes Estuary Management Committee members, including:
  - NSW Oyster Quality Assurance Program
  - Myall Waterways Chamber of Commerce
  - Marina Operators Association
  - Hunter Water Corporation
  - Eco Network
  - Port Stephens Tourism
  - Recreational Fishing Advisory Council
  - Newcastle District Fisherman's Coop
  - Marine Waterfront Operators Association
  - Environmental Protection Authority
  - Waterways Authority
  - National Parks and Wildlife Service
  - Myall Lakes Yacht Club
  - NSW Fisheries
  - Department of Land and Water Conservation
  - Aboriginal Land Councils (Including Worimi and Karuah)
  - Mid Coast Water
  - Lower North Coast Catchment Management Board
  - Nelson Bay Chamber of Commerce
  - Coastal Council of NSW
  - NSW Waterways
  - Marine and Coastal Community Network
  - Royal Volunteer Coast Patrol, Nelson Bay
  - Coastguard, Lemon Tree Passage
  - Individual members of Portwatch (John Clark, Darrel Dawson)
  - John Bartlett MLA Port Stephens
  - John Turner MLA Great Lakes
  - Bob Baldwin MP Paterson
- Pindimar/ Bundabah Residents Association
- Other community leaders including Julie Savage, Ron Richards, Rick Wraight and Kevin Haskew.

7. CONCLUDING COMMENTS

7.1 Key Potential Environmental Issues

As identified throughout this Preliminary EAR, the key environmental issues that may require further consideration in the Environmental Assessment Report are as follows:

- Water management
- Abalone disease control
- Bushfire hazard
- Native vegetation impacts
- Seagrass and mangrove impacts

Detailed assessment of the environmental and statutory issues identified in the Preliminary EAR will provide an appropriate level of environmental assessment for the Project Application.

Appendix 1 - Record of Minister's Opinion: Applicability of Major Projects SEPP

NSW GOVERNMENT
Department of Planning

Record of Minister's opinion for the purposes of Clause 6(1) of the State Environmental Planning Policy (Major Projects) 2005

I, the Director-General of the Department of Planning, as delegate of the Minister for Planning under delegation executed on 31 October 2005, have formed the opinion that the development described in the Schedule below, is development of a kind that is described in Schedule 1 of *State Environmental Planning Policy (Major Projects) 2005* – namely development for the purposes of aquaculture located in environmentally sensitive areas if State Significance - and is thus declared to be a project to which Part 3A of the *Environmental Planning and Assessment Act 1979* applies for the purpose of section 75B of that Act.

Schedule

The development proposed by Australian Bounty Seafoods for the construction and operation of a aquaculture facility and associated infrastructure at Carruthers Avenue, Pindimar, as generally described in a letter dated 17 July 2007 from Australian Bounty Seafoods to the Department of Planning.

SHaddad

Sam Haddad
Director-General

Date: 17. 10. 2007.

Appendix 2 - Letter of Business Interest: Fresh Seafood Wholesaler Ariyasu (Japan)

Austasia Leefield Pty Ltd
鎌田英樹 様

平成20年8月14日

鮮魚問屋 有安
鈴木安廣

拝啓 時下の候 貴社におかれましては益々のご清祥のこととお喜び申し上げます。
さて、早速ですが、お問い合わせ頂きました件につきましてご連絡申し上げます。

敬具

1. 鮑の販売協力について
今般御社が扱われます鮑について、市場内外に向けて販路の拡大に努力することを確約致します。

2. 会社概要
当社は活魚から一般鮮魚、及び冷凍魚全般を取り扱っております。
取り引き先につきましては主に、
中央魚類(株)、名古屋中水(株)、大水(株)、大阪魚市場(株)、大京魚類(株)、神港魚類(株)他
全国の中央市場を中心に取り引きを行っております。

3. 魚介類保管施設・輸送機器の概略について
保管施設として、活魚水槽(150t)があります。
輸送機器として、トラック(4t、2t)等があります。

以上

To Austasia Leefield Pty Ltd.

Greetings. As per our conversation please note the following points:

1. Sales Co-operation of abalone:
We confirm our interest in providing market access for your product.

2. About our Company:
We market many species of live, chilled and frozen seafood. Our main trading partners include:
Chuo- Gyorui Inc., Nagoya Chusui Inc., Daisui Inc., Osaka Fish Market, Daikyou Gyorui Inc., Shinko Gyorui etc..
We also deal with other wholesale markets throughout Japan.

3. Our Facilities include:
Holding facilities with a capacity of 150 tonnes live seafood
A fleet of trucks capable of transporting live seafood.

Fresh Seafood Wholesaler Ariyasu
Yasuhiro Suzuki
14th August 2008