

**BUSHFIRE PROTECTION ASSESSMENT**

**FOR THE PROPOSED**

**PINDIMAR ABALONE FARM**

**ON**

**LOT 2 in DP 1014683,**

**PINDIMAR**

**FOR**

**RELIANCE HOLDINGS PTY LTD**



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B101348 - 5	Final	25.11.2010	3.2.2014	<i>G.L.Swain</i>

## EXECUTIVE SUMMARY

*Australian Bushfire Protection Planners Pty Limited*, at the request of *City Plan Services*, on behalf of *Reliance Holdings Pty Ltd*, has undertaken the bushfire consultancy to inform the Environmental Assessment [EA] on the bushfire protection measures required for the development of the proposed Pindimar Abalone Farm on Lot 2 in DP 1014683, Pindimar.

The site on which it is proposed to construct the new Pindimar Abalone Farm is located to the west of the residential area of South Pindimar on the northern shores of Port Stephens. The unmade Carruthers Avenue and the shoreline of Port Stephens borders the site's south-eastern boundary. The north-eastern boundary fronts Clarke Street while the remaining boundaries of the site are bordered by private land-holdings.

Access to the southern portion of the site is gained off Challis Avenue, via a gravel track within the road reserve of Como Street, which extends off Cambage Street. Access to the north-eastern portion of the site is available directly off Clarke Street.

The site contains numerous gravel access tracks.

The proposed Abalone Farm is located within a partially cleared area of the southern portion of the site with access provided via an upgraded road link to Challis Avenue via Como Street and Cambage Street.

The Director-General's requirements for the Environmental Assessment, issued on the 26 May 2010 require 'bushfire management including details of Asset Protection Zones and hazard reduction to be examined as a 'key issue'. The DGR's also require that consultation take place with the NSW Rural Fire Service.

The Great Lakes Bushfire Prone Land Map records the site as containing Category 1 bushfire prone vegetation. Therefore, this report undertakes an assessment to examine the measures required to minimise bushfire risk on the proposed development and determines the deemed-to-satisfy bushfire protection requirements in accordance with the provisions of *Planning for Bushfire Protection 2006*, and provides recommendations on the provision of Asset Protection Zones [Defendable Spaces] to the future buildings in the Pindimar Abalone Farm.

This report also assesses the adequacy of fire-fighting access and water supplies; construction standards of the buildings, the management of the Asset Protection Zones [Defendable Spaces] and evacuation protocols necessary to address the bushfire risk to the proposed development and to address the aim and objectives of *Planning for Bushfire Protection 2006*.

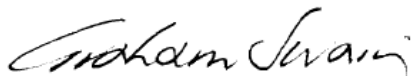
The report has found that the proposed Abalone Farm is located in a high bushfire risk area with no direct, safe vehicular/pedestrian access to the 'safer place' provided by the South Pindimar Village.

There is a requirement therefore, to investigate the provision of an alternate means of access to the Farm which provides direct access to the end of Cambage Street – this being achieved in the construction of an elevated pedestrian boardwalk across Pig Station Creek.

As a result of the consultation process and a review of the Draft Environmental Assessment, the NSW Rural Fire Service sought clarification on a number of matters as outlined below:

- 1) The standard of public road access to the site from Cambage Street, including the provision of a turning area at the end of the public road;
- 2) Detail of the turning area within the site, near the sheds;
- 3) Location of the fire fighting water tank;
- 4) Provision for a safe refuge within the development for staff and fire-fighters; and
- 5) The reference to the 'safer place' on the foreshore to Port Stephens should not be construed as being a 'Neighbourhood Safer Place' identified by the Rural Fire Service.

Discussions have occurred with Mr. Paul Creenaune from the NSW Rural Fire Service [Coffs Harbour Service Centre] and this amended report addresses the matters raised by the NSW Rural Fire Service.



Graham Swain,

Managing Director,

***Australian Bushfire Protection Planners Pty Limited.***

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## SECTION 1

### INTRODUCTION

#### 1.1 Aim of this Report.

In addition to addressing the Director General's Requirements [DGRs] issued on the 26<sup>th</sup> May 2010 and to prepare a bushfire protection assessment for the project in accordance with the aim and objectives of *Planning for Bushfire Protection 2006*, this amended report addresses the matters raised by the NSW Rural Fire Service during consultation.

#### 1.2 Statutory Requirements.

This amended report has been prepared having regard to the following legislative and planning requirements:

##### 1.2.1 Legislation.

##### ***Environmental Planning and Assessment Act - 1979 (EPA Act)***

Planning and development within NSW is regulated by the *Environmental Planning & Assessment Act, 1979* (EPA Act). Part 3A [Major Developments] of the Act commenced on the 1<sup>st</sup> August 2005 and consolidated the assessment and approval regime for all major developments previously addressed under Part 4 [Development Assessment] or Part 5 [Environmental Assessment] of the Act. Although Part 3A has since been repealed, this project will continue to be assessed under Part 3A as a 'transitional project'.

##### 1.2.2 Planning Policies.

##### ***Planning for Bushfire Protection – 2006. [Rural Fire Service]***

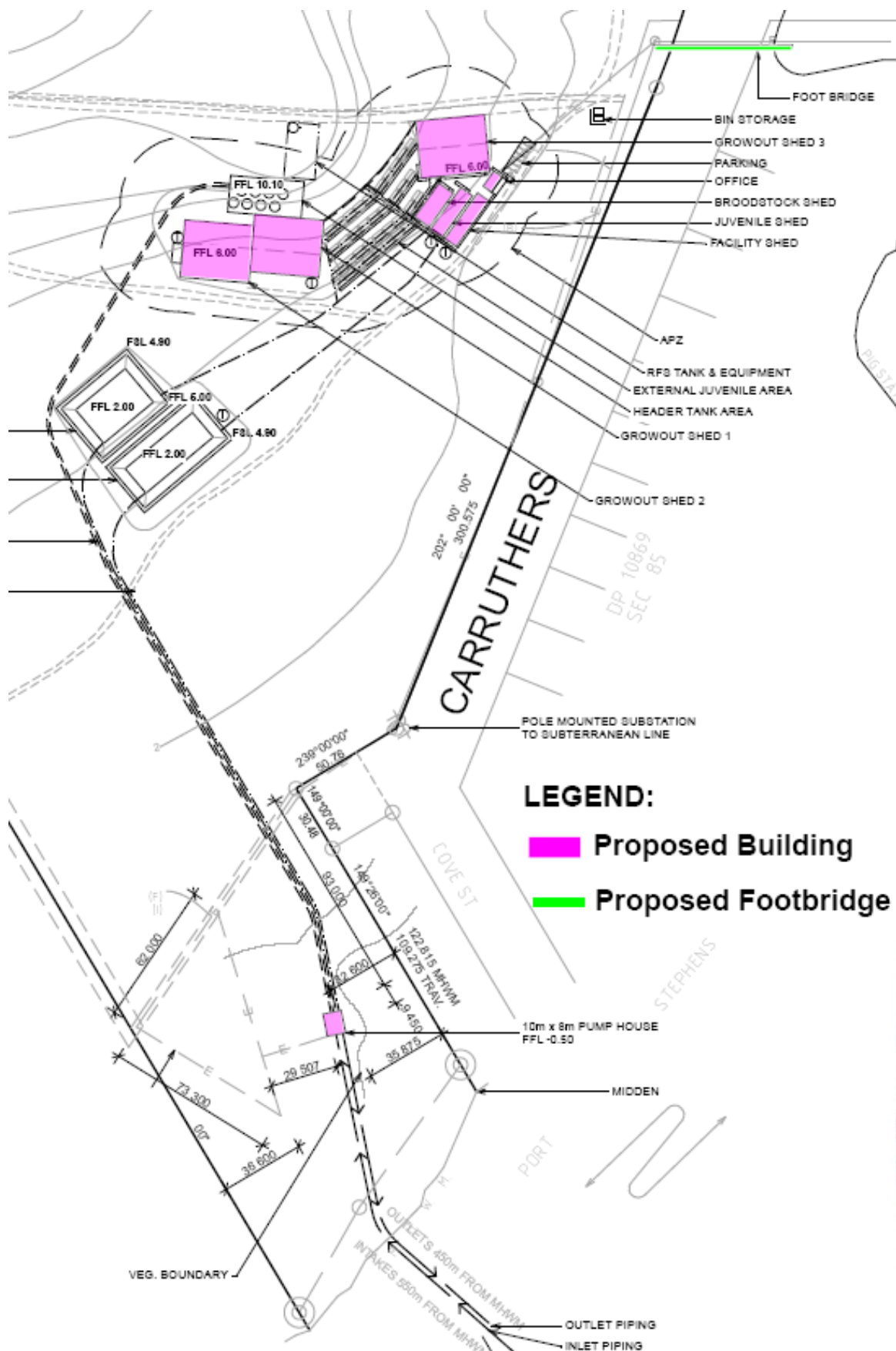
This document provides guidance on the planning and development control processes in relation to bushfire protection measures for rural residential and residential subdivision, "Special Fire Protection" and Class 5 – 8 and 10 buildings in bushfire prone areas [Industrial buildings are Class 7 as defined by the Building Code of Australia].

The document provides deemed-to-satisfy specifications on the provision of defensible space requirements to Class 5 – 8 & 10 developments; access/water supply provisions; construction standards to buildings and management / maintenance of the defensible space to buildings is also provided.

#### 1.3 Development Proposal.

*Australian Bushfire Protection Planners Pty Limited*, at the request of *Reliance Holdings Pty Ltd*, has undertaken the bushfire consultancy to inform the Environmental Assessment of the bushfire protection measures required for the development of the proposed Pindimar Abalone Farm on Lot 2 in DP 1014683, Pindimar.

**Figure 1 – Overall Site Plan of the Pindimar Abalone Farm.**



### LEGEND:

- Proposed Building
- Proposed Footbridge



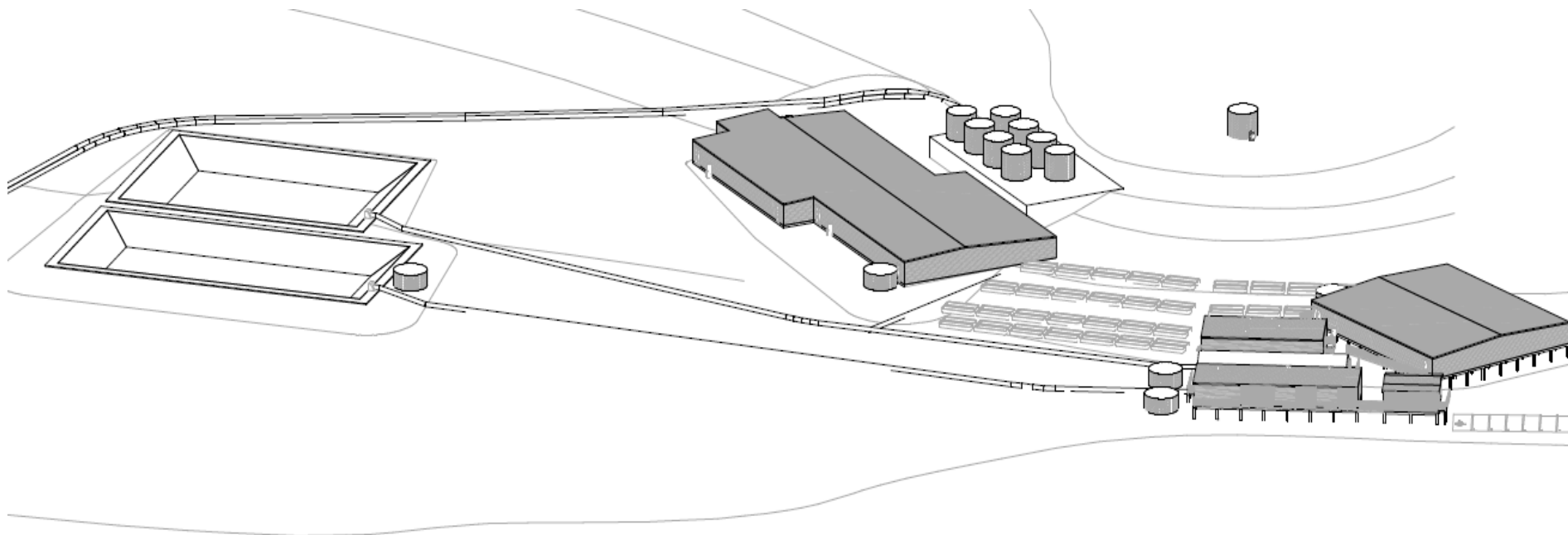


Site plan of the proposed 100,000-gallon RFS facility. The plan shows various structures including Growout Sheds 1, 2, and 3, a Broodstock Shed, a Juvenile Shed, a Facility Shed, an Office, and Bin Storage. It also indicates the location of the RFS Tank & Equipment, External Juvenile Area, Header Tank Area, and APZ. Elevation markers include FFL 10.10, FFL 6.00, FFL 5.00, FFL 2.00, and FSL 4.90. A Foot Bridge is shown crossing a water body. The plan is oriented with North at the top.

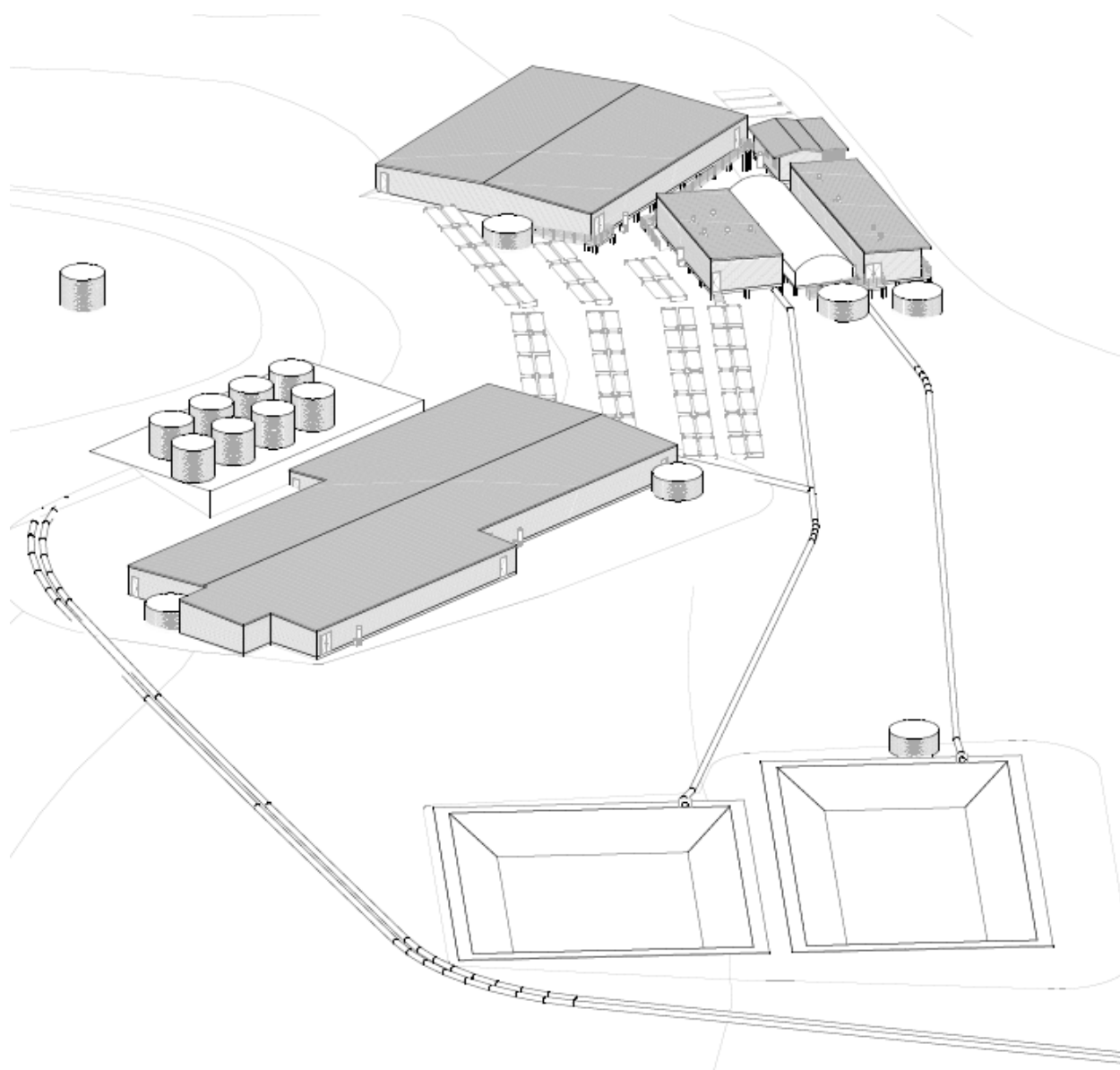


[illegible]

**Figure 4 – Southeast View of complex.**



**Figure 5 – Southwest View of complex.**



#### **1.4 Documentation reviewed in this Assessment.**

To achieve the aim of this report, a review of information relevant to the property was undertaken. Information sources reviewed included the following documents:

- Director General Requirements issued on the 26<sup>th</sup> May 2010;
- Development Plans of Abalone Farm prepared by Sorensen Design and Planning;
- *Planning for Bushfire Protection 2006* prepared by the NSW Rural Fire Service/Planning N.S.W;
- Australian Standard AS3959 *Construction of Buildings in Bushfire Prone Areas*;
- *Rural Fires Regulation 2008*;
- Great Lakes Council *Certified Bushfire Prone Land Map*;
- *Review of Draft Environmental Assessment* – DoPI.

#### **1.5 Site Inspection.**

Graham Swain of **Australian Bushfire Protection Planners Pty Limited** inspected the development site on the 7<sup>th</sup> of September 2010 to assess the topography, gradients of the land within and external to the site and vegetation classification within and adjoining the development property, existing bushfire mitigation measures and a visual assessment of bushfire threat.

Additional site inspections have occurred with the most recent being held on the 3<sup>rd</sup> August 2011. The land adjoining the development site was also inspected to determine the surrounding land use / land management practices and extent of bushfire prone vegetation.

#### **1.6 Authority Consultation.**

The DGR's specifically require consultation with the NSW Rural Fire Service in order to obtain advice on bushfire protection measures to the development. Discussions were held with Ms. Nika Foman of the Development Control Department, NSW Rural Fire Service on the 26<sup>th</sup> September 2011.

Ms. Foman acknowledged that the proposed development would require appropriate defendable spaces in accordance with Section 4.3.6(f) – Buildings of Class 5 to 8 and Class 10 buildings – of *Planning for Bushfire Protection 2006*. Ms. Foman also accepted that the proposed boardwalk provided an alternate egress to the foreshore to Port Stephens [off Cambage Avenue].

The matters raised in the Review of the Draft Environmental Assessment have been discussed with Mr. Paul Creenaune from the NSW Rural Fire Service's Coffs Harbour Customer Service Centre.

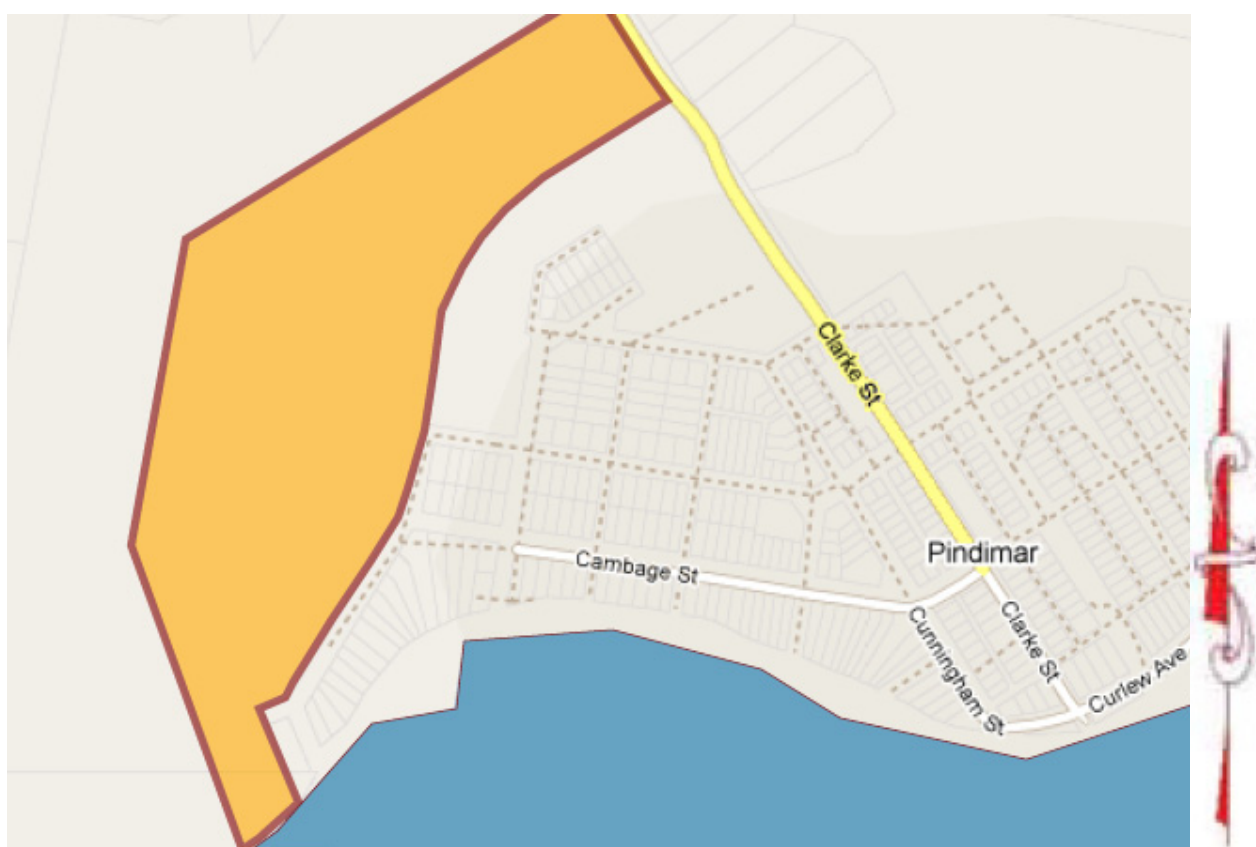
## SECTION 2

### PROPERTY DESCRIPTION

#### 2.1 Location.

The site on which it is proposed to construct the new Pindimar Abalone Farm comprises 51.32 hectares of vacant land within Lot 2 in DP 1014683, which is located to the west of the residential precinct of South Pindimar, within Great Lakes local government area.

**Figure 6 – Location of Development Site.**



#### 2.2 Existing Land Use.

The development site contains predominantly vacant land.

#### 2.3 Surrounding Land Use.

The landuse adjoining the boundaries of the development site is as follows:

**(a) North**

The land to the north of the development site contains rural and rural residential land.

**(b) East**

The land adjoining the eastern boundary of the development site contains vacant land.



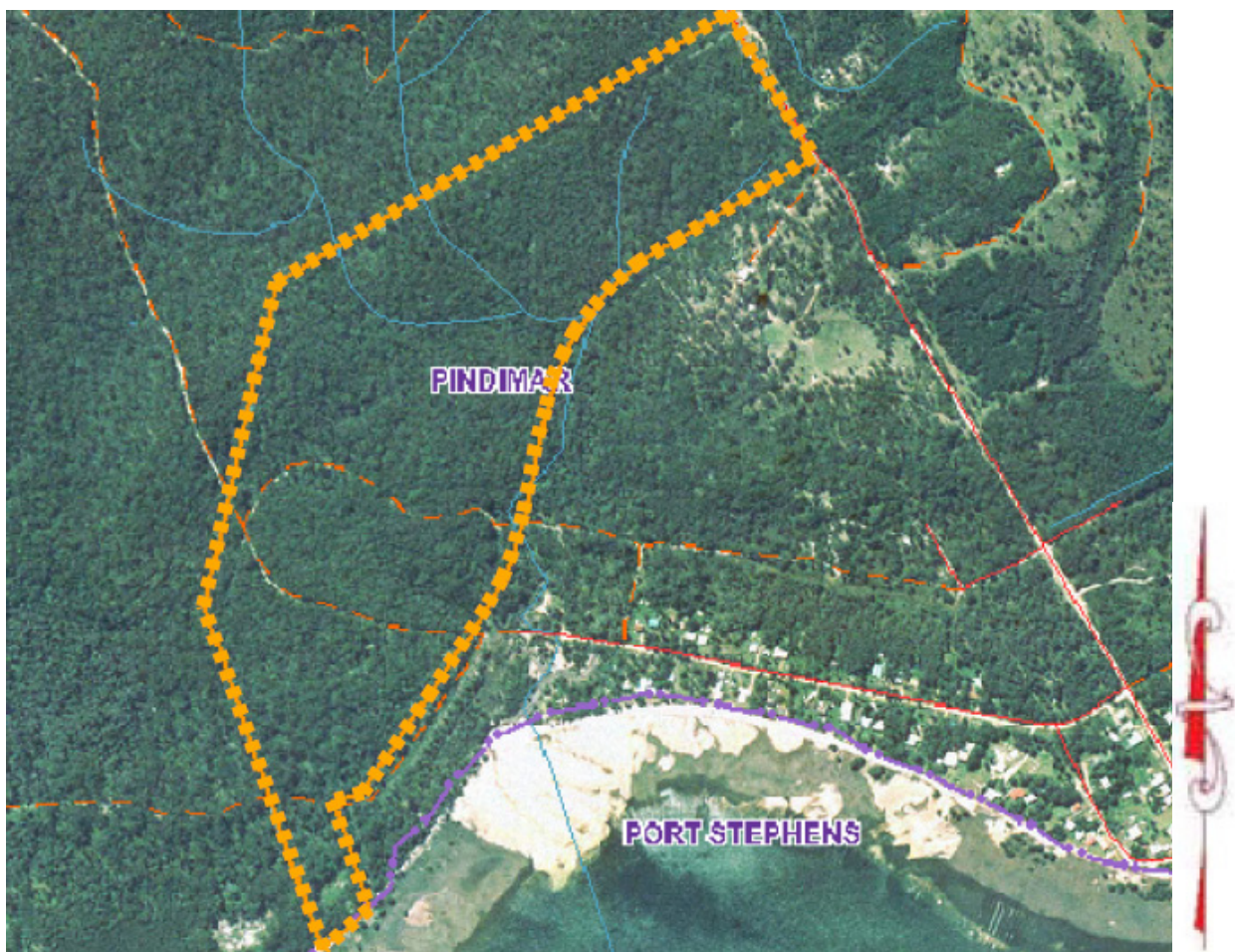
(c) **Southeast**

The land adjoining the southern boundary of the development site consists of the unmade road reserve of Carruthers Avenue which contains an access track. Beyond the road reserve vacant land extends to the shoreline of Port Stephens.

(d) **West**

The land to the west of the development site consists of mostly vacant land with a dwelling located on the land to the west of the proposed Abalone Farm site.

**Figure 7 – Aerial Photograph of Site showing adjoining landuse.**



Source – SixViewer



**Figure 8 – Aerial Photograph of the south portion of the development site showing location of Abalone Farm site.**



**Figure 9 – Cadastre Plan showing southern portion of development site.**





## 2.4 Topography.

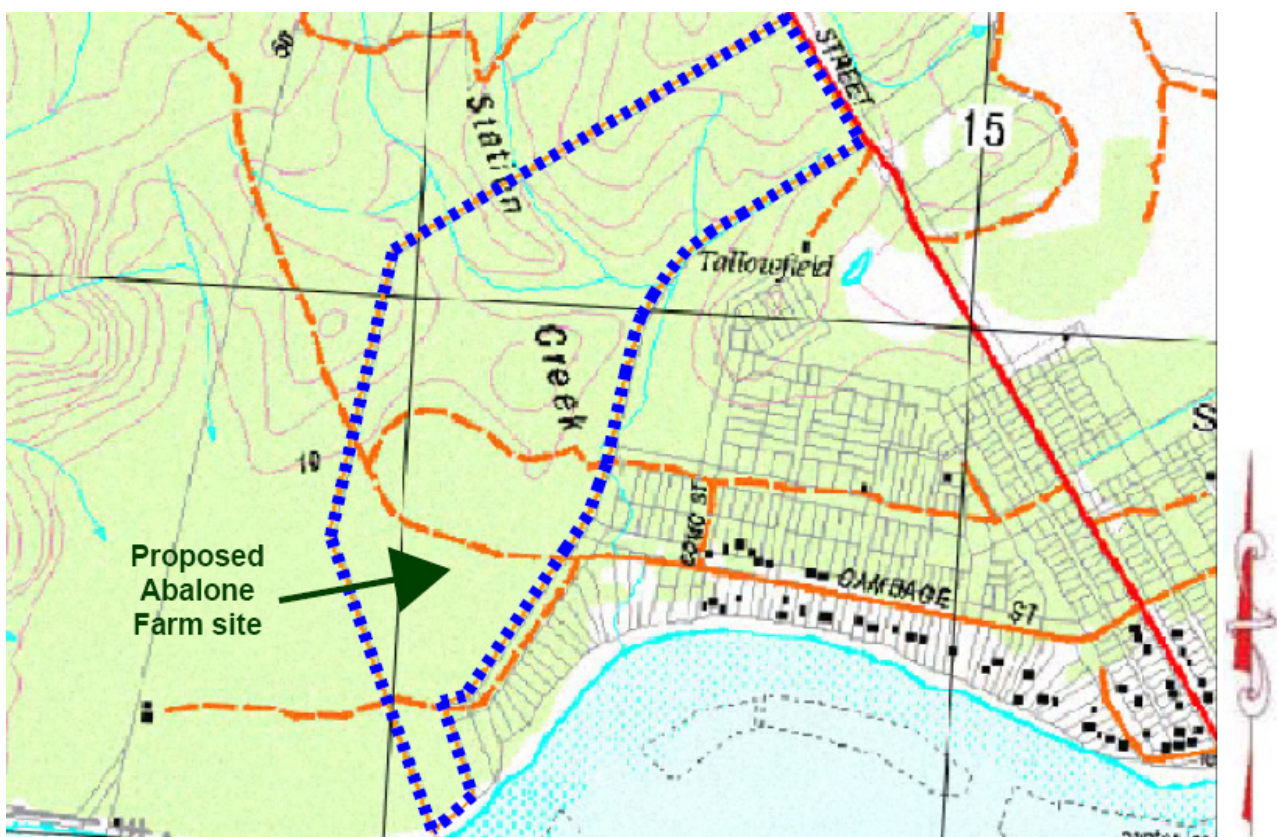
Appendix 2 of *Planning for Bushfire Protection 2006* states that slopes should be assessed, over a distance of at least 100m from a development site and that the gradient of the land should be determined which will most significantly influence the fire behaviour on the site.

### ***Within 100 metres of the proposed Abalone Farm site:***

The Abalone Farm site is located on the southern portion of the development site, on the southern face of a ridge which rises above the level land on the foreshore to Port Stephens and Pig Station Creek and turns to the northeast to form a higher knoll located in the central portion of the development site.

The land to the south, southeast and east of the Abalone Farm site is level whilst to the west the land falls at 5 degrees to the level land on the adjoining property. The land to the north of the Abalone Farm site rises at 5 degrees to the apex of the ridgeline before falling at 5 – 10 degrees into a short gully line, before rising at 5 degrees to the saddle to the north.

***Figure 10 – Topographic Map of development site and adjoining lands.***



## **2.5 Vegetation within the Development Site.**

Appendix A2.3 of *Planning for Bushfire Protection 2006* provides a methodology for determining the predominant bushfire prone vegetation for at least 140 metres in all directions from the buildings. Vegetation is classified using Table A2.1 of *Planning for Bushfire Protection 2006*, which classifies vegetation types into the following groups:

- (a) *Forests [wet & dry sclerophyll forests];*
- (b) *Woodlands;*
- (c) *Plantations – being pine plantations not native plantations;*
- (d) *Forested Wetlands;*
- (e) *Tall Heaths;*
- (f) *Freshwater Heaths;*
- (g) *Short Heaths;*
- (h) *Alpine Complex;*
- (i) *Semi – arid Woodlands;*
- (j) *Arid Woodlands; and*
- (k) *Rainforests.*

The vegetation within the development site has been investigated by Wildthing Environmental Consultants. Figure 13 [below] provides a map of the vegetation communities found within the development site. The following section provides a description of the vegetation communities within 140 metres of the proposed Abalone Farm site.

## **2.6 Vegetation within 140 metres of the proposed Abalone Farm Site.**

### **(a) North.**

The land to the north of the proposed Abalone Farm site consists of Open Eucalypt Forest.

### **(b) East.**

The land to the east of the proposed Abalone Farm site consists of Open Forest on the ridgeline extending into Swamp Mahogany / Paperbark Forest on the level land. Mangroves and Salt Marsh occupy the mud-flats of Pig Station Creek with Swamp Oak Forest on the land to the east of Pig Station Creek.

### **(c) Southeast & south.**

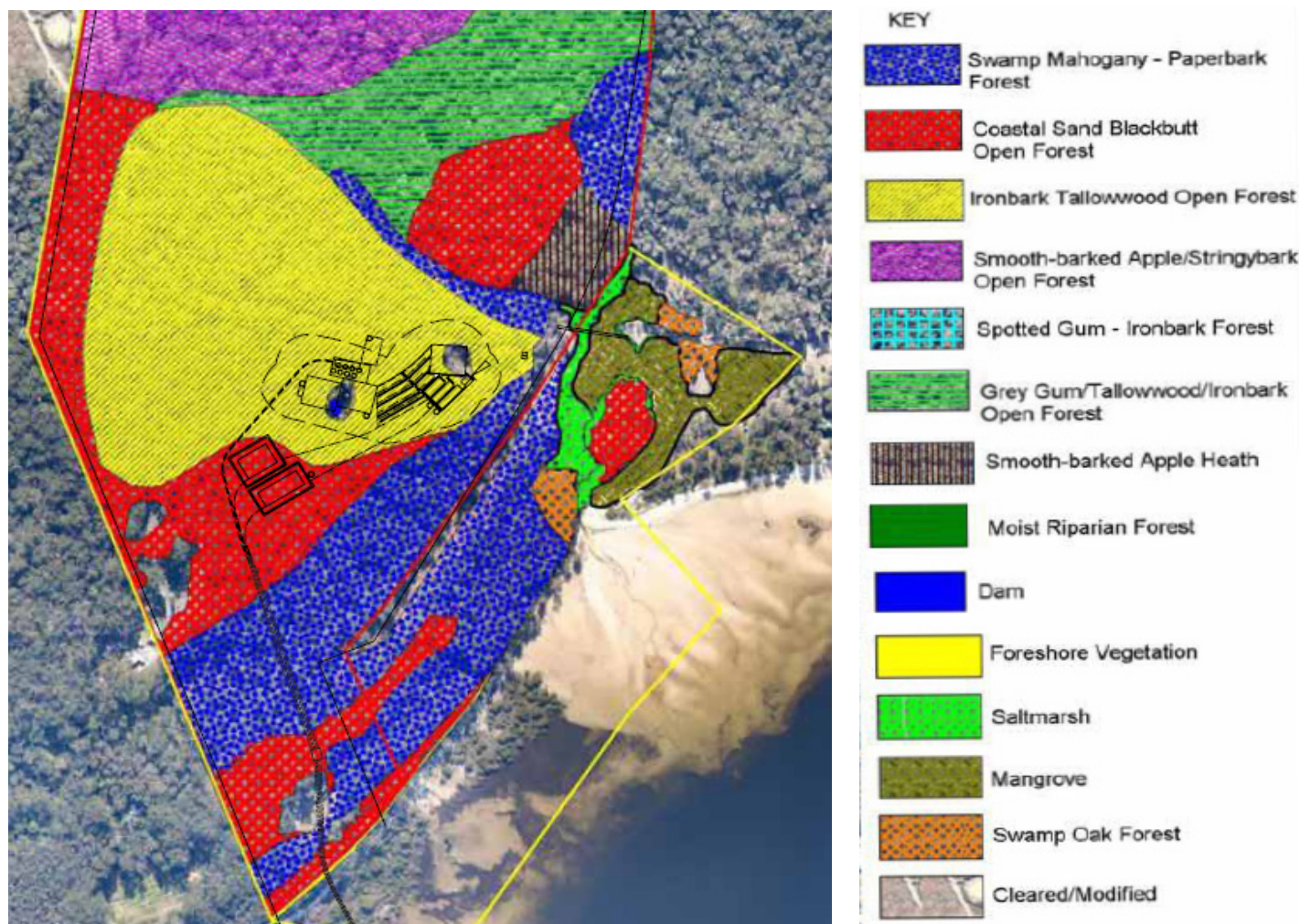
The land to the southeast and south of the proposed Abalone Farm site contains predominantly Swamp Mahogany / Paperbark Forest that extends to the Port Stephens foreshore.

### **(d) Southwest & west.**

The land to the southwest and west of the proposed Abalone Farm site contains Open Eucalypt Forest.



**Figure 11 – Plan of Vegetation within 140 metres of the Abalone Farm Site.**



Source – Wildthing Environmental Consultants



## 2.7 Site Photographs



***Photograph No. 1 – View of access track within Challis Avenue.***



***Photograph No. 2 – View of entry gate at the end of Challis Avenue.***





***Photograph No. 3 – View of existing access track from proposed Abalone Farm site to access gate.***



***Photograph No. 4 – View looking east along Power Line Easement across Pig Station Creek to the western end of Cambage Street.***





***Photograph No. 5 – View looking southwest along Power Line Easement/unmade section of Carruthers Avenue.***



***Photograph No. 6 – View of the site of proposed Abalone Farm.***

## **2.8 Significant Environmental Features within the proposed Abalone Farm Site.**

The proposed Abalone Farm development site does not contain significant environmental features such as SEPP 14 Wetlands; SEPP 26 Littoral Rainforests; land slip areas, National Parks Estate, areas of geological interest or riparian zones.

The Abalone Farm development site contains vegetation which is potential SEPP 44 Koala Habitat;

## **2.9 Known Threatened Species, Population or Ecological Community within the Abalone Farm development precinct.**

The Abalone development precinct has been located within Ironbark/Tallowwood Open Forest and Coastal Sand Blackbutt Open Forest. Neither of these vegetation communities constitutes an Endangered Ecological Community [EEC].

The proposed pipeline to the foreshore of Port Stephens extends through an area of Swamp Mahogany Paperbark Forest [EEC] vegetation however the proposed construction includes a partially elevated and partially buried pipeline which minimises the ecological footprint. The location of the Pump House is clear of vegetation.

The boardwalk will extend through 'Saltmarsh' vegetation which is an EEC however Wildthing's assessment concludes that construction of the boardwalk is unlikely to have any significant impact on this EEC.

## **2.10 Details and location of Aboriginal Relics or Aboriginal Place.**

There is a Shell Midden located on the foreshore of Port Stephens, near where the pipeline to the Abalone Farm enters the bay.

The construction of the buildings, ponds and associated facilities within the Abalone Farm development site do not impact on this site.



## SECTION 3

### FIRE MANAGEMENT RESPONSIBILITIES

Fire management within the development site is the responsibility of:

#### 3.1 Great Lakes Council.

Great Lakes Council has responsibility, under Section 66 of the *Rural Fires Act*, to issue a notice in writing requiring an owner / occupier of any land within the LGA to carry out bushfire hazard reduction works on that land. Section 100E of the *Rural Fires Act* requires Council to issue bushfire hazard reduction certificates for hazard reduction to be undertaken on private lands.

#### 3.2 New South Wales Rural Fire Service.

The NSW Rural Fire Service (RFS) has the responsibility for undertaking fire suppression activities, hazard management activities and other functions relative to emergency management, within its areas of operation. *Section 73* of the *Rural Fires Act (1997)* enables the Commissioner to carry out bush fire hazard reduction works on any land as required by a bush fire risk management plan if the work has not been carried out satisfactorily. Incurred costs can be recovered as a debt owed to the Crown.

#### 3.3 Fire & Rescue New South.

The Fire & Rescue NSW has the responsibility for undertaking fire suppression activities, and other functions relative to emergency management, within its area of operation and through Mutual Aid Agreements, provide assistance to the NSW Rural Fire Service, particularly for structural fire operations within the NSW Rural Fire Brigade Districts. Hazmat management within New South Wales is the responsibility of Fire & Rescue NSW.

#### 3.4 Great Lakes Bush Fire Management Committee.

The Great Lakes Bushfire Management Committee has the responsibility for planning for co-ordinated fire fighting activities / hazard management activities on a local government level. It is not an operational organization, a fire fighting organization or a funding source for fire management activities.

The Bush Fire Management Committee is supported by the following provisions of the Rural Fires Act 1997:

- **Section 52** requires each Bush Fire Management Committee to prepare a draft bush fire management plan for their local areas which includes a plan of operations and a bush fire risk management plan.
- **Section 54** of the Act specifies that a draft bush fire risk management plan is to 'set out schemes for the reduction of bush fire hazards in the rural fire district or other part of the State'.

*A draft bush fire risk management plan may also restrict or prohibit the use of fire or other fire hazard reduction activities in all or specified circumstances or places to which the plan applies.*

### **3.5 Public Authorities & owners/occupiers of land.**

*The Rural Fires Act, 1997 provides several legislative opportunities to require Public Authorities, land owners and occupiers to manage hazardous fuels. These are listed below:*

- **Section 63(1)** states that it is the duty of a public authority to take any practicable steps to prevent the occurrence of bushfires on, and to minimise the danger of the spread of a bushfire on or from:
  - (a) any land vested in or under its control or management, or*
  - (b) any highway, road, street, land or thoroughfare, the maintenance of which is charged on the authority.*
- **Section 63(2)** states that *'it is the duty of the owner or occupier of land to take the notified steps (if any) and any other practicable steps to prevent the occurrence of fires on, and to minimise the danger of the spread of fires on or from that land'.*
- **Section 65A** states that the *'Commissioner may nominate a member of the Service as a hazard management officer'.*
- **Section 65(2)** states that *'an authorised person may, with the permission of the fire fighting authority or other authority responsible for unoccupied Crown land or managed land or a person nominated by the authority to give such permission, enter the land and carry out bushfire hazard reduction work with the assistance of such other persons as the authorised person considers to be necessary for the purpose'.*
- **Section 65(3)** states that *'the authority responsible for unoccupied Crown land or managed land is to be taken to have given the permission under this section to the extent necessary to give effect to a bushfire risk management plan'.*
- **Section 65(4)** states that *'if permission under this section is given subject to conditions, the conditions must be complied with'.*
- **Section 66(1)** states that *'a hazard management officer may, by notice in writing, require the owner or occupier [not being a public authority] of any land to carry out bushfire hazard reduction work specified in the notice on the land'.*

- **Section 66(2)** states that *‘a hazard management officer must serve a notice under this section if required to do so by a bushfire risk management plan applicable to the land that is in force’.*
- **Section 66(3)** states that *‘a hazard management officer must issue a bushfire hazard reduction certificate in respect of any bushfire hazard reduction work required by a notice issued in accordance within section (2)’.*
- **Section 66(6)** states that *‘the requirements and conditions so specified must include any requirements in a bushfire risk management plan that is applicable to the land and is in force and may include a requirement or condition that the burning of fire breaks or of combustible material;*  
*(a) must in fire district constituted under the Fire Brigades Act 1989 be carried out by or under the supervision of the fire brigade or an officer in charge of the fire brigade;*  
*(b) must outside a fire district, be carried out by or under the supervision of the rural fire brigade specified in the notice or an appropriate officer of the rural fire brigade or any hazard management officer.*
- **Section 66(7)** states that *‘a notice requiring the establishment of a firebreak cannot require an occupier or owner to kill or remove any trees that are reasonably necessary for shade, shelter, windbreak or fodder purposes or the protection of threatened species, populations, ecological communities or critical habitats within the meaning of the ‘Threatened Species Conservation Act 1995’.*
- **Section 66(8)** states that *‘an occupier or owner to whom a bushfire hazard reduction notice is given must, despite the fact that a fire permit has not been granted under Division 5, comply with the requirements specified in the notice’.*
- **Section 70(2)** states that *‘if within the time specified in the relevant notice the owner or occupier to whom it is given fails to comply with any requirement of the notice, the Commissioner may, without prejudice to liability of the owner or occupier, enter on the land and carry out the bushfire hazard reduction work the owner or occupier was required to do under the notice’.*
- **Section 70(3)** states that *‘any costs incurred by the Commissioner in carrying out such work may be recovered from the owner or occupier of the land as a debt due to the Crown in a court of competent jurisdiction’.*
- **Section 87** allows the removal of hazards in the bush fire danger period by the provision of a permit system. The permits are valid for 21 days, excluding TOBAN [Total Fire Ban] days.

Section 10 permits are not required to adhere to *Part V* provisions of the EPA Act 1979 in the assessment of impact, except for public authorities. An owner/occupier of private land must obtain from the NSW Rural Fire Service, a bushfire hazard reduction certificate before undertaking hazard reduction works on that land (Section 100E of the *Rural Fires Act 1997*).

### **3.6 Bushfire Hazard Management within the Abalone Farm Development Site.**

The management of the defensible space to the facilities within the Abalone Farm development site will remain the responsibility of the property owner.

A condition of approval may be considered by the Consent Authority for a Positive Covenant, created under the provisions of the *Conveyancing Act of 1919*, to be placed on the title of the land to ensure compliance with the management prescriptions for the Defensible Spaces detailed in this report [Refer to Section 4.2].

## SECTION 4

### BUSHFIRE PROTECTION ASSESSMENT

#### 4.1 Introduction.

*Planning for Bushfire Protection 2006* provides deemed-to-satisfy fire protection measures for residential development [Class 1, 2 & 3 buildings]; “Special Fire Protection Developments [Hospitals, Nursing Homes / Retirement Villages / Schools / Childcare Centres & Tourist Accommodation]; Industrial / Commercial Development and residential and Special Fire Protection “infill” development.

In reference to the construction of the proposed Pindimar Abalone Farm the future buildings are classified as Class 7 buildings as defined by the Building Code of Australia [BCA].

Chapter 1, Section 1.3 of *Planning for Bushfire Protection 2006* states that the construction of Class 5 – 10 buildings on bushfire prone land, or land impacted by bushfire prone vegetation, must meet the aim and objectives of the document.

Chapter 4, Section 4.3.6(f) discusses the bushfire protection to buildings of Class 5 to 8 and 10b of the Building Code of Australia and states:

*“The Building Code of Australia does not provide for any bushfire specific performance requirements and as such AS 3959 -1999 does not apply as a set of “deemed-to-satisfy” provisions.*

*The general fire safety construction provisions [of the BCA] are taken as acceptable solutions, but the aim and objectives of Planning for Bushfire Protection 2006 apply in relation to other matters such as access, water and services, emergency planning and landscaping/vegetation management”.*

*“Where the aim and objectives of PfBFP [Section 1.1] are not met, then the construction requirements for bushfire protection will need to be considered on a case-by-case basis”.*

*“In many cases, these types of developments will require on-site parking and loading areas. In such cases, it is prudent to place these facilities in the most appropriate location in order to establish defensible space for fire-fighting purpose”.*

The objectives of *Planning for Bushfire Protection 2006* are:

- (i) Afford occupants of any building adequate protection from exposure to a bushfire;
  - (ii) Provide for a defensible space to be located around buildings;
  - (iii) Provide appropriate separation between a hazard and buildings which, in combination with other measures, prevent direct flame contact and material ignition;
  - (iv) Ensure that safe operational access and egress for emergency service personnel and residents is available;
  - (v) Provide for ongoing management and maintenance of bushfire protection measures, including fuel loads in the asset protection zones;
- and
- (vi) Ensure that utility services are adequate to meet the needs of fire-fighters and others assisting in bushfire fighting.

The document identifies six core bushfire protection requirements. These are:

- Provision of Asset Protection Zones / Defensible Spaces in accordance with the specific landuse, the predominant bushfire prone vegetation type within 140 metres of the development and the topography of the land containing the bushfire prone vegetation;
- Access for fire fighting operations;
- Water Supplies for fire fighting operations;
- Construction standards of buildings located within 100 metres of the bushfire hazard interface, dependant on specification landuse, the predominant bushfire prone vegetation type within 140 metres of the development and the topography of the land containing the bushfire prone vegetation;
- Emergency Planning;
- Landscape Management – in particular the management of the Asset Protection Zones / Defensible Spaces and residual bushfire prone vegetation.

*Planning for Bushfire Protection 2006* provides a methodology to determine the Asset Protection Zones [defensible space] and Bushfire Attack [Construction Standards] required for **habitable buildings** in development for **residential purposes** that are designated as bushfire prone.

The document does not provide deemed to satisfy solutions for Class 5 – 10 buildings constructed in bushfire prone areas but states that where the aim and objectives of the document are not met, then the construction requirements for bushfire protection will need to be considered on a case by case basis.

Sections 4.2 and 4.3 of this report examine the location of the proposed buildings in relation to the provision of a suitable “defendable space” between the bushfire hazard and the proposed buildings and the protection against the potential impacts of a future fire occurrence in the vegetation on and beyond the development site and provides recommendations on the bushfire protection measures required to be implemented to mitigate the potential bushfire threat.

The provision of access and water supplies for fire-fighting operations, management of the defendable space [Asset Protection Zone] and evacuation planning are examined in Sections 4.4 – 4.9 of this report.

#### **4.2 The provision of Defendable Space/s [Asset Protection Zones].**

Appendix 2 of *Planning for Bushfire Protection 2006* provides the following procedure for determining setback distances (Asset Protection Zones) for **residential development** in bushfire prone areas:

- (a) *Determine vegetation formations as follows:*
  - Identify vegetation in all directions from the site for a distance of 140 metres;
  - Consult Table A2.1 to determine the predominant vegetation type; and
  - Select the predominant vegetation formation as described in Table A2.1.
- (b) *Determine the effective slope of the land under the predominant vegetation Class.*
- (c) *Determine the appropriate fire [weather] area in Table A2.2.*
- (d) *Consult Table A2.3 and determine the appropriate setback [APZ] for the assessed land use, vegetation formation and slope range.*

The methodology does not determine the requisite Defendable Space requirements for Class 5 – 10 developments as defined by the Building Code of Australia [BCA].



Table 1 examines the width of defensible space requirements based on the widths required to provide a separation distance which is sufficient to minimise flame contact on the buildings and to provide a fire-fighting platform wide enough to permit the safe extinguishment of a bushfire, after the fire front has passed.

**Table 1. Determination of Defendable Space to the future buildings – Pindimar Abalone Farm**  
Fire Danger Index [FDI] for the site is 100

Aspect	Vegetation within 140m of development	Predominant Vegetation Formation Class [Table A2.1 Planning for Bushfire Protection 2006]	Effective Slope of Land for 100 metres from buildings	Flame Zone Width determined by calculation	Recommended width of Defendable Space to proposed building
North	Ironbark Tallowwood Open Forest	Forest	5 degrees upslope to the north	16 metre flame zone width	20 metre wide Defendable Space to the north of the building precinct
East	Ironbark Tallowwood Open Forest; Swamp Mahogany - Paperbark Forest; Coastal Sand Blackbutt Forest	Forest	Level	16 metre flame zone width	20 metre wide Defendable Space to the east of the building precinct
South	Swamp Mahogany - Paperbark Forest	Forest	Level	16 metre flame zone width	20 metre wide Defendable Space to the south of the building precinct
West & north west	Coastal Sand Blackbutt Forest; Ironbark Tallowwood Open Forest	Forest	< 5 degrees downslope	20 metre flame zone width	30 metre wide Defendable Space to the west and northwest of the building precinct

**Note:**

*All of the Defendable Space setbacks exceed the minimum 'flame zone' setback widths for forest vegetation.*

### 4.3 Construction Measures to Buildings.

The assessment provided in Table 1 identifies that the minimum Defendable Space widths required between the future buildings and the bushfire prone vegetation have been established so as to minimise flame contact with the buildings and therefore reduce the likely radiant heat exposure on the buildings to less than 40kW/m<sup>2</sup>.

Therefore the buildings within the proposed development shall be constructed to the standards of BAL 40 [radiant heat flux of 40kW/m<sup>2</sup>] as defined by A.S. 3959 – 2009.

In addition, there is the possibility that burning embers may impact upon the buildings. The following construction standards are therefore recommended:

- Any operable windows shall be fitted with aluminium/stainless steel mesh flyscreens having a maximum mesh aperture size of 2mm;
- Access doors to the buildings shall be fitted with seals that seal the bottom, stiles and head of the door against the opening/frame to prevent the entry of embers into the building. Particular attention shall be paid to the gap at the head of the curtain of the roller doors, where mohair type seals can be used;
- Any external vents, grilles and ventilation louvres shall have stainless steel mesh with a maximum aperture of 2mm square fitted to prevent the entry of embers into the building or be fitted with a louvre system which can be closed in order to maintain a maximum aperture or gap of no more than 2mm;
- Roof ventilators shall be fitted with stainless steel flymesh [2mm aperture] to prevent the entry of embers into the building/s or be fitted with a louvre system which can be closed in order to maintain a maximum aperture or gap of no more than 2mm;
- Roof gutters shall be fitted with a non-combustible gutter guard.

#### **4.4 Access Standards for Firefighting Operations.**

Chapter 4, Section 4.2 “Access” of *Planning for Bushfire Protection 2006* provides specifications on the access provisions for fire-fighting operations within developments which are subject to bushfire attack.

Existing vehicular access is available to the Abalone Farm development site via the gravel access road within Como Street and Challis Avenue, thence via the internal access tracks.

The road formation within Como Street and Challis Avenue was recently upgraded as part of the granting of consent by Great Lakes Council for the occupation of the dwelling house on the adjacent property to the west of the development site.

Approval for the upgrade of the public roads was granted by Great Lakes Council and an Engineering Works Permit issued on the 26<sup>th</sup> April 2012.

The extract on Page 32 is a copy of Item 11 from the Notice of Determination [Consent] detailing the public road access road upgrade requirements in order to provide safe operational access for fire services.

## 11. Works within the road reserve

Prior to the issue of a construction certificate, an application for a Public Engineering Works Permit (PEWP) must be submitted to and approved by Council for the road reserve works listed in the table below. Each work must be carried out in accordance with the standard specified in the column opposite the work. All works must include the adjustment and/or relocation of services as necessary to the requirements of the appropriate service authorities.

Work	Standard to be provided
Road pavement construction in accordance with Planning for Bushfire Protection 2006,	Provision of a 100mm compacted gravel pavement topping from the intersection of Cambage St. / Como St. to Challis Ave. to the frontage of Lot 2 DP 1014683 in accordance with Planning for Bushfire Protection 2006 Section 4.1.3 (2)

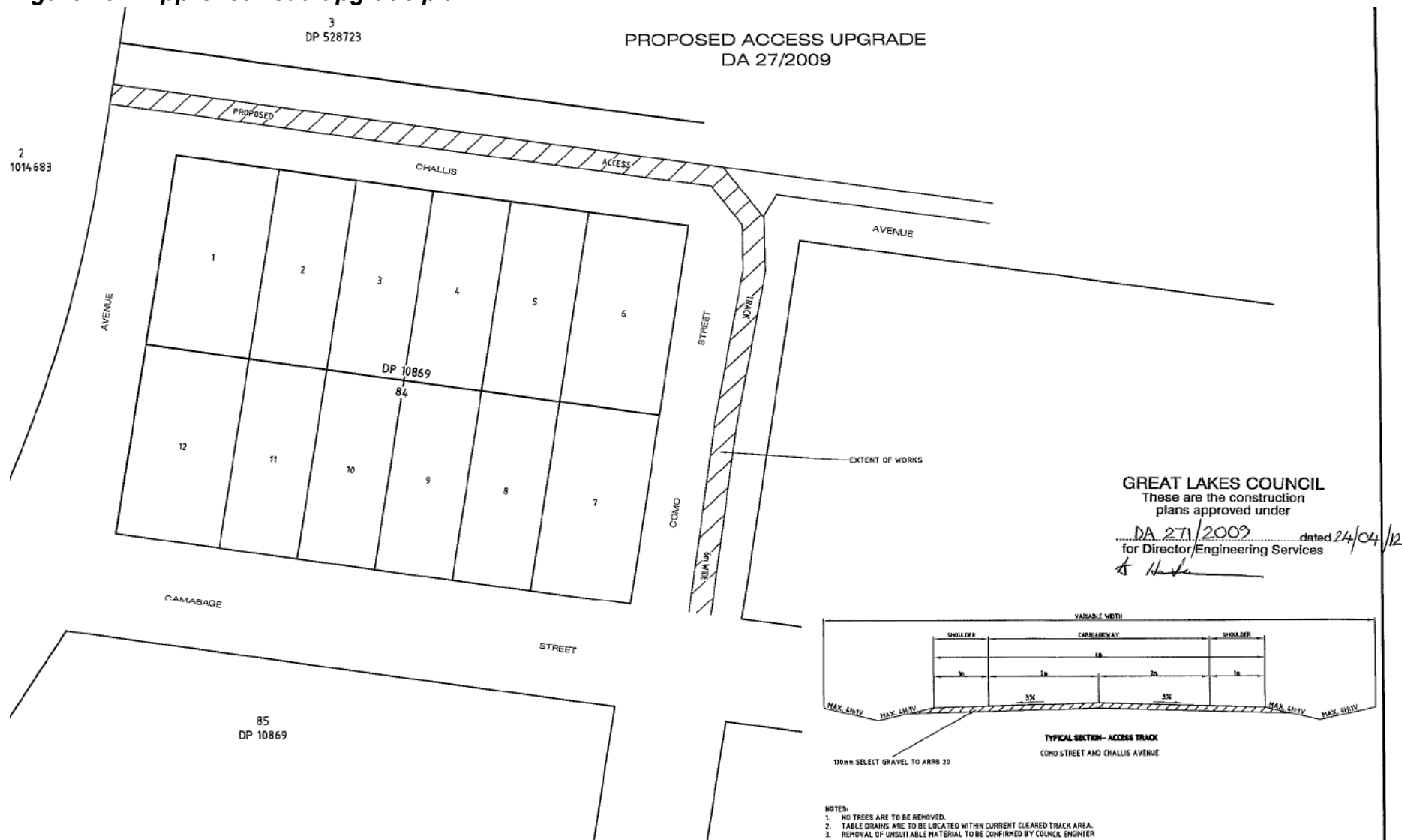
**Reason:** To provide safe operational access for emergency services while residents are seeking to evacuate from an area and to ensure works within Council's road reserve are constructed to a suitable standard for public safety.

Figure 12 is a copy of the plan submitted to Great Lakes Council for approval of the works within Como Street and Challis Avenue. Figure 13 on Page 33 is a copy of the approved Engineering Works Plan which shows that the road upgrade provides for a 6.0 metre wide compacted gravel formation [4m carriageway + 1m wide compacted gravel shoulder to both sides], which under the circumstance of the proposed use, provides for satisfactory two-way vehicular access for fire appliances and occupants of the Abalone Farm and adjoining dwelling.

**Figure 12 – Copy of the approved road upgrade plan**



**Figure 13 – Approved road upgrade plan**



**Internal Roads:**

Figure 12 on Page 32 is a copy of the Access Tracks Plan which was approved by Great Lakes Council for the occupation of the dwelling on the adjoining land to the west and shows the existing access tracks within the property.

The internal tracks which provide access to the proposed Abalone Farm precinct shall be upgraded to provide a minimum formed width of 4.0 metres, within a cleared corridor of 6.0 metres wide x 4.0 metres high. The road surface and bridge across Pig Station Creek shall be designed and constructed to carry a rigid heavy vehicle of 15 tonne GVM.

The access gate to the property shall be relocated to the west of Pig Station Creek so as to provide a turning area at the intersection of the existing access roads.

Access gates shall be minimum 3.6 metre clear width with a new gate erected on the road to the Abalone Farm and a second gate erected on the existing access road to the neighbouring land to the west – Refer to Figures 12 below.

The main access road to the Abalone Farm complex follows the route of the existing access track from the existing property access gate with connection to the existing fire trail which runs parallel to the north of the plant complex, extending to the west where it connects with the access track to the adjoining property. The intersection of the access road/fire trail provides a suitable turning area for fire appliances.

A second turning area is provided at the intersection of the access road and the fire trail which runs along the southern side of the plant complex. Turning areas are also provided at the intersection of the Abalone Farm access road and the access track to the neighbouring property and the fire trails and the access track to the neighbouring property – Refer to Figure 12.

‘T’ or ‘Y’ turning heads shall be constructed to provide a 6.0 metre radius to internal corners.

Passing bays shall be provided at 200 metre intervals or at strategic locations which permit fire appliances to pass safely [i.e. blind corners] – Refer to Figure 14.

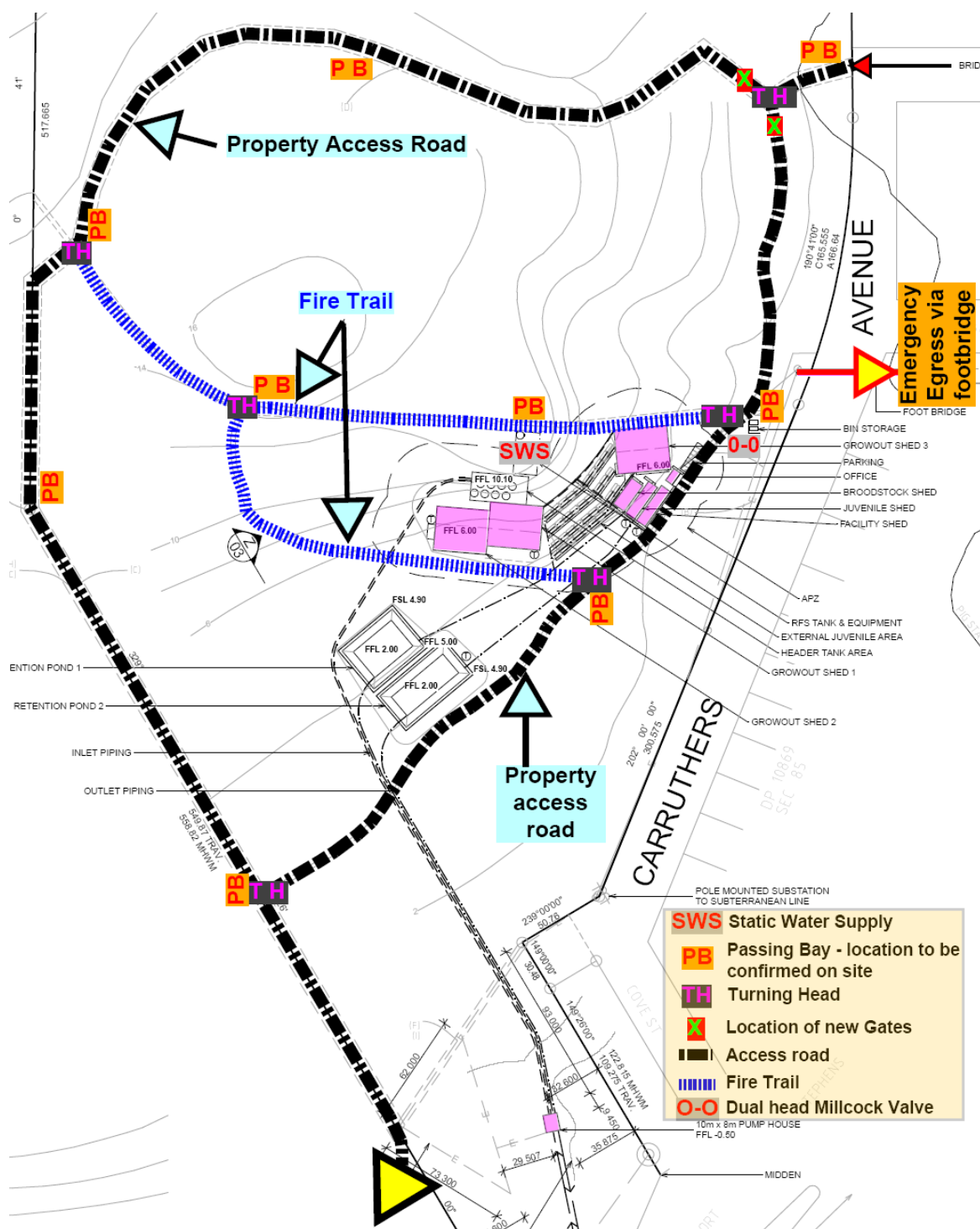
**Fire Trails:**

Existing fire trails within the development site shall be maintained to a width of 4.0 metres within a 6.0 metre width x 4.0 metre high corridor kept clear of grasses and shrubs.



Passing bays shall be provided at 200 metre intervals or at strategic locations which permit fire appliances to pass safely [i.e. blind corners] – Refer to Figure 14.

**Figure 14 – Schematic Diagram of fire-fighting access routes; Static Water Supply Tank and location of Millcock Valve [Hydrant].**



#### **4.5 Water Supplies for Firefighting Operations.**

The proposed Abalone Farm will draw water from Port Stephens for the culture of the Abalone with potable water supplied from freshwater storage tanks as there is no reticulated water supply within the Pindimar Village.

There shall be a static water supply of 50,000 litres provided for fire-fighting operations, complete with diesel powered pump and fire hose reels installed in locations throughout the development precinct in order to enable wet-down of each building within the facility.

The Static Water Supply shall be provided in a concrete or steel tank located to the south of the internal Fire Trial as shown on the Site Plan.

There shall be installed a 65mm diameter gravity fill line fed from the Static Water Supply tanks to a 2 x 65mm outlet Millcock Valve [Hydrant] located at the Passing Bay, adjacent to the Bin Storage area - Refer to Figure 12 for diagrammatic location of Millcock Valve.

#### **4.6 Emergency Management for Fire Protection / Evacuation.**

The proposed development precinct is located within a high bushfire risk area with access to the facility provided by gravel access roads which do not provide a safe means of escape for the operators of the Farm or attending fire –fighters.

It is therefore recommended that there shall be provided an alternate means of pedestrian access, via a new board-walk across Pig Station Creek, to the western terminus of Cabbage Street. Access to this emergency egress shall be clearly sign posted with gates provided for security with a key located in a 'break-glass' enclosure on the development side of the board-walk.

An onsite 'Safe Refuge' shall be provided in the Office Complex with appropriate signage provided to identify the location of the Assembly Area/Safe Refuge – Refer to Figure 15 below.

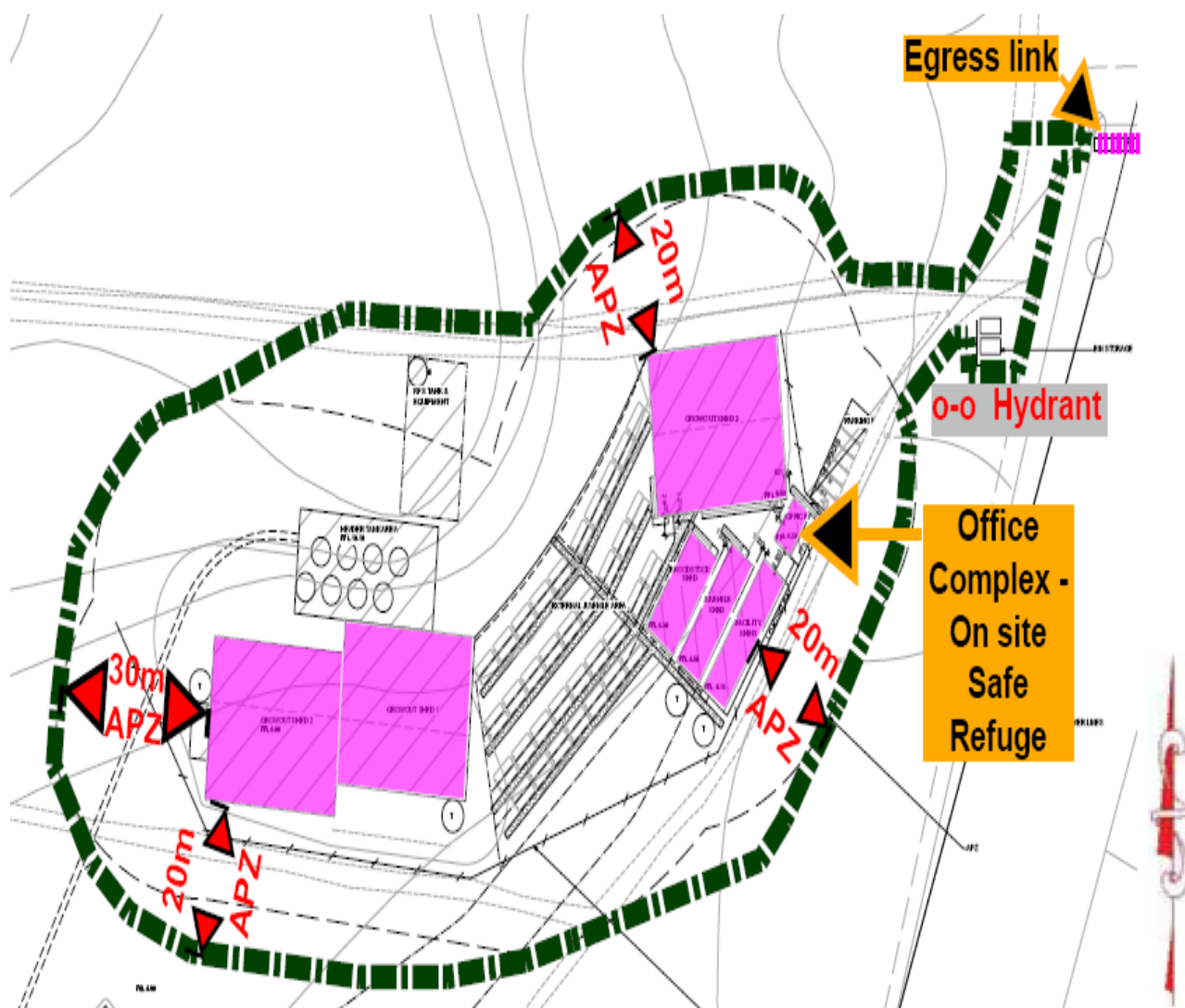
The location of the Office Complex provides ready access to the pedestrian egress via the board-walk over Pig Station Creek, is shielded to the north, northwest, west and southwest, being the predominant fire paths, by the Growout Shed No. 3; Broodstock Shed; Juvenile Shed and Facility Shed and is adjacent to the main access road to the facility.

This report has also recommended that all buildings shall be constructed to comply with BAL 40, pursuant to the specifications of A.S. 3959 – 2009, increasing the protection and survivability of the Office Complex [Safe Refuge].

An Evacuation Plan shall be prepared for the facility and shall be submitted to the Great Lakes Shire Council and the New South Wales Rural Fire Service prior to commencement of the construction works.



**Figure 15 – Location of on-site Safe Refuge.**



#### **4.7 Bushfire Hazard Management.**

The intention of bushfire hazard management is to prevent flame contact with a structure, reduce radiant heat to below the ignition thresholds for various elements of a building, to minimize the potential for wind driven embers to cause ignition and to reduce the effects of smoke on occupants and fire-fighters.

The management of the Defendable Space shall comply with the recommendations of Appendix A5.4 & Appendix A5.5 of *Planning for Bushfire Protection 2006* and the NSW Rural Fire Service's *Standards for Asset Protection Zones [Inner Protection Area]*.

Management of the Defendable Space within the development shall comply with the following minimum standards:

- Maintain a clear area of low cut lawn or pavement adjacent to the buildings; utilise non-flammable materials such as Scoria, pebbles and recycled crushed bricks as ground cover to landscaped areas in close proximity to buildings;
- Keep areas under shrubs and trees raked and clear of combustible fuels;
- Trees and shrubs should be maintained in such a manner that tree canopies are separated by 2 metres and understorey vegetation is not continuous [retained as clumps];
- Tree crowns shall not over-hang buildings and shall be maintained to provide a minimum clearance of 5 metres between the buildings and mature tree canopies;
- Trees are under-pruned to provide a minimum 2 metre clearance between the ground and the lower limbs of the tree;
- Accumulated ground fuels [grasses, leaves & twigs] shall be regularly managed to maintain a maximum fuel loading of 3 – 5 tonnes/hectare.

## SECTION 5

### BUSHFIRE MANAGEMENT STRATEGIES

Strategies to mitigate the potential bushfire risk to the future buildings within the proposed Pindimar Abalone Farm are as follows:

#### 5.1 Strategy 1 – Defendable Space Requirements

**Table 2. Defendable Space to the future buildings**

Aspect	Vegetation within 140m of development	Predominant Vegetation Formation Class	Effective Slope of Land for 100 metres from buildings	Recommended width of Defendable Space to proposed building
North	Ironbark Tallowwood Open Forest	Forest	5 degrees upslope to the north	20 metre wide Defendable Space to the north of the building precinct
East	Ironbark Tallowwood Open Forest; Swamp Mahogany - Paperbark Forest; Coastal Sand Blackbutt Forest	Forest	Level	20 metre wide Defendable Space to the east of the building precinct
South	Swamp Mahogany - Paperbark Forest	Forest	Level	20 metre wide Defendable Space to the south of the building precinct
West & north west	Coastal Sand Blackbutt Forest; Ironbark Tallowwood Open Forest	Forest	< 5 degrees downslope	30 metre wide Defendable Space to the west and northwest of the building precinct

#### 5.2 Strategy 2 – Defendable Space management Requirements

Management of the Defendable Space within the development shall comply with the following minimum standards:

- Maintain a clear area of low cut lawn or pavement adjacent to the buildings; utilise non-flammable materials such as Scoria, pebbles and recycled crushed bricks as ground cover to landscaped areas in close proximity to buildings;
- Keep areas under shrubs and trees raked and clear of combustible fuels;
- Trees and shrubs should be maintained in such a manner that tree canopies are separated by 2 metres and understorey vegetation is not continuous [retained as clumps];
- Tree crowns shall not over-hang buildings and shall be maintained to provide a minimum clearance of 5 metres between the buildings and mature tree canopies;

- Trees are under-pruned to provide a minimum 2 metre clearance between the ground and the lower limbs of the tree;
- Accumulated ground fuels [grasses, leaves & twigs] shall be regularly managed to maintain a maximum fuel loading of 3 – 5 tonnes/hectare.

### **5.3 Strategy 3 – Construction Standards to the proposed buildings:**

The buildings within the proposed development shall be constructed to the standards of BAL 40 [radiant heat flux of 40kW/m<sup>2</sup>] as defined by A.S. 3959 – 2009.

In addition, there is the possibility that burning embers may impact upon the buildings. The following construction standards are therefore recommended:

- Any operable windows shall be fitted with aluminium/stainless steel mesh flyscreens having a maximum mesh aperture size of 2mm;
- Access doors to the buildings shall be fitted with seals that seal the bottom, stiles and head of the door against the opening/frame to prevent the entry of embers into the building. Particular attention shall be paid to the gap at the head of the curtain of the roller doors, where mohair type seals can be used;
- Any external vents, grilles and ventilation louvres shall have stainless steel mesh with a maximum aperture of 2mm square fitted to prevent the entry of embers into the building or be fitted with a louvre system which can be closed in order to maintain a maximum aperture or gap of no more than 2mm;
- Roof ventilators shall be fitted with stainless steel flymesh [2mm aperture] to prevent the entry of embers into the building/s or be fitted with a louvre system which can be closed in order to maintain a maximum aperture or gap of no more than 2mm;
- Roof gutters shall be fitted with a non-combustible gutter guard.

### **5.4 Strategy 4 – Water Supplies for Firefighting Operations:**

There shall be a static water supply of 50,000 litres provided for fire-fighting operations, complete with diesel powered pump and fire hose reels installed in locations throughout the development precinct in order to enable wet-down of each building within the facility.

The Static Water Supply shall be provided in a concrete or steel tank located to the south of the internal Fire Trail as shown on the Site Plan. There shall be installed a 65mm diameter gravity fill line fed from the Static Water Supply tanks to a 2 x 65mm outlet Millcock Valve [Hydrant] located at the Passing Bay, adjacent to the Bin Storage area - Refer to Figure 15 for diagrammatic location of Millcock Valve.

### **5.5 Strategy 5 – Emergency Management for Fire Protection / Evacuation:**

There shall be an alternate means of pedestrian access provided, via a new board-walk across Pig Station Creek, to the western terminus of Cambage Street. Access to this emergency egress shall be clearly sign posted with gates provided for security with a key located in a 'break-glass' enclosure on the development side of the board-walk.

An onsite 'Safe Refuge' shall be provided in the Office Complex with appropriate signage provided to identify the location of the Assembly Area/Safe Refuge.

An Evacuation Plan shall be prepared for the facility and shall be submitted to the Great Lakes Shire Council and the New South Wales Rural Fire Service prior to commencement of the construction works.

### **5.6 Strategy 6 – Access Standards for Firefighting Operations.**

#### ***Internal Roads:***

The internal tracks which provide access to the proposed development shall be upgraded to provide a minimum formed width of 4.0 metres, within a cleared corridor of 6.0 metres wide x 4.0 metres high. The road surface and bridge across Pig Station Creek shall be designed and constructed to carry a rigid heavy vehicle of 15 tonne GVM.

The access gate to the property shall be relocated to the west of Pig Station Creek so as to provide a turning area at the intersection of the existing access roads. Access gates shall be minimum 3.6 metre clear width with a new gate erected on the road to the Abalone Farm and a second gate erected on the existing access road to the neighbouring land to the west – Refer to Figure 15.

The main access road to the Abalone Farm complex follows the route of the existing access track from the existing property access gate with connection to the existing fire trail which runs parallel to the north of the plant complex, extending to the west where it connects with the access track to the adjoining property. The intersection of the access road/fire trail provides a suitable turning area for fire appliances.

A second turning area is provided at the intersection of the access road and the fire trail which runs along the southern side of the plant complex. Turning areas are also provided at the intersection of the Abalone Farm access road and the access track to the neighbouring property and the fire trails and the access track to the neighbouring property – Refer to Figure 15.

‘T’ or ‘Y’ turning heads shall be constructed to provide a 6.0 metre radius to internal corners.

Passing bays shall be provided at 200 metre intervals or at strategic locations which permit fire appliances to pass safely [i.e. blind corners] – Refer to Figure 15.

***Fire Trails:***

Existing fire trails within the development site shall be maintained to a width of 4.0 metres within a 6.0 metre width x 4.0 metre high corridor kept clear of grasses and shrubs.

Passing bays shall be provided at 200 metre intervals or at strategic locations which permit fire appliances to pass safely [i.e. blind corners] – Refer to Figure 15.

**5.7 Strategy 7 – Emergency Procedures Plan:**

A Bushfire Emergency Procedures Plan shall be prepared for the facility and shall identify the protocols for protection of the operation of the farm during bushfire emergencies.

## SECTION 6

### CONCLUSION

A Project Approval is being sought, under transitional Part 3A [Major Developments] provisions of the *Environmental Planning & Assessment Act 1979*, for the construction of the Pindimar Abalone Farm on Lot 2 in Deposited Plan 1014683, a 51.32 hectare site to the west of Pindimar Village, on the northern shore of Port Stephens.

The Director General's Requirements [DGRs] for the preparation of the Environmental Assessment for the project include, under 'key issues' states that "Bushfire management including details of Asset Protection Zones and hazard reduction must be examined. The DGR's also require that consultation take place with the NSW Rural Fire Service.

The Great Lakes Bushfire Prone Land Map records the site as containing bushfire prone vegetation.

This report has reviewed the proposed development against the deemed-to-satisfy provisions of *Planning for Bushfire Protection 2006* and has found that the construction of the proposed Abalone Farm buildings in the location as shown on the Project Application documentation can provide defensible spaces between the buildings and the bushfire prone vegetation.

These setback widths exceed the 'flame zone' widths required to address the NSW Rural Fire Service's requirements for Class 5 – 10 buildings [as defined by the Building Code of Australia]. However, the proposed development precinct is located in a high bushfire risk area and the access/egress roads will not be safe to use during bushfire events which spread rapidly through the vegetation on the land within the development site and on adjoining lands.

In order to address the requirement for an alternate egress from the development precinct it has been recommended that a board-walk shall be constructed across Pig Station Creek linking to the western end of Cambage Street and that a site specific Evacuation Plan be prepared for the facility.

This amended report also examines the matters raised in the Review of Draft Environmental Assessment by the NSW Rural Fire Service, resulting in the additional provision of the Office Complex as an onsite Safe Refuge.

Access to the Abalone Farm complex has also been reviewed in light of the matters raised by the Rural Fire Service and clarification of those requirements included in the road design, including the location of passing bays and turning areas for fire appliances and relocation of the property access gate in order to provide a turning area at the end of the public road.



The provision of a fire-fighting water supply has also been clarified with the Static Water Supply remaining as shown on the Site Plan with a 65mm diameter supply line taken to a point adjacent to the Bin Storage including the provision of a dual-head 65mm Millcock Valve.

Table 3 summarises the extent to which the Concept Plan conforms to the deemed-to-satisfy specifications of *Planning for Bushfire Protection 2006*.

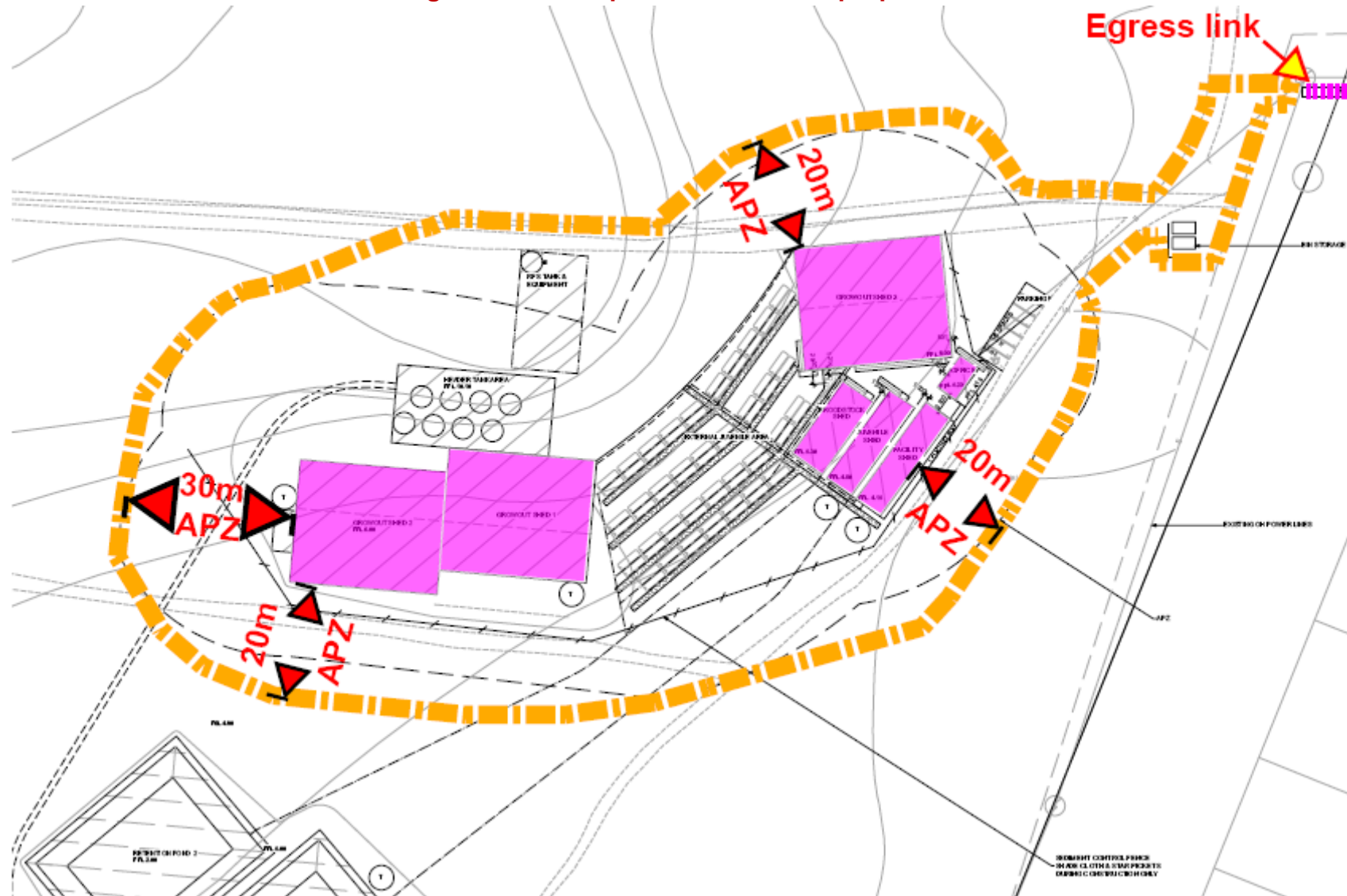
**Table 3. Compliance with the deemed-to-satisfy provisions of *Planning for Bushfire Protection 2006*.**

<b>Bushfire Protection Measure</b>	<b>Compliance with deemed-to-satisfy provisions of <i>Planning for Bushfire Protection 2006</i>.</b>
Asset Protection Zone/Defendable Space setbacks	Widths of the Defendable Spaces to the proposed Class 7 Buildings exceed the minimum 'flame zone' setback width required by the NSW Rural Fire Service.
The siting and adequacy of water supplies for fire fighting	Static Water supply to be provided complete with Diesel pump and Fire Hose Reels to each building and dual head Millcock Valve with 65mm outlets
Design of Public Roads	Existing access roads to be upgraded and maintained to comply with the specifications of Section 4.1.3(2) of <i>Planning for Bushfire Protection 2006</i> .
Design of Fire Trail network	Existing fire trail network to be upgraded and maintained to comply with Section 4.1.3(3) of <i>Planning for Bushfire Protection 2006</i>
Adequacy of emergency response access and egress	Emergency response access and egress available via access road network – alternate emergency pedestrian egress to be provided to Cambage Street.
Adequacy of bushfire maintenance plans and fire emergency procedures	A Fire Management Plan is to be prepared, identifying the protocols for the management of the vegetation within and external to the development precinct. A Bushfire Emergency Procedures Plan shall also be prepared for the facility and shall identify the protocols for protection of the operation of the farm during bushfire emergencies. These plans shall be prepared prior to commencement of the operation of the plant.
Building construction standards	Construction standards shall be applied to the proposed buildings [BAL40]
Adequacy of sprinkler systems and other fire protection measures to be incorporated into the development	Bushfire Sprinkler Systems not applicable.
Emergency Management	A Safe Refuge is to be provided within the Office Complex. A Bushfire Evacuation Plan is shall be prepared which provides protocols for the safe relocation of staff/visitors/others during emergency events, including bushfire occurrences in the surrounding vegetation. A copy of the Evacuation Plan shall be provided to Great Lakes Shire Council and the NSW Rural Fire Service prior to commencement of the construction of the plant.



Graham Swain,  
Managing Director,  
***Australian Bushfire Protection Planners Pty Limited.***

**ATTACHMENT A – Plan showing Defendable Space widths to the proposed Pindimar Abalone Farm.**



## REFERENCES:

- N.S.W Rural Fire Service – *Planning for Bushfire Protection 2006*;
- *Environmental Planning & Assessment Act – 1979*;
- *Rural Fires Act – 1997*;
- *Rural Fires Regulation 2008*;
- NSW Rural Fire Service – *Guideline for Bushfire Prone Land Mapping 2006*;
- *Bushfire Environmental Assessment Code 2006*;
- Building Code of Australia;
- Australian Standard A.S 3959-2009 “*Construction of Buildings in Bushfire Prone Areas*”;
- *Great Lakes Council Bushfire Prone Land Map*.