



ESSENTIAL ECONOMICS



Port Welshpool Marina

Economic and Design Assessment

Prepared for

South Gippsland Shire Council

By

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and

Water Technology

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INTRODUCTION

Background

South Gippsland Shire Council commissioned Essential Economics Pty Ltd and Water Technology to prepare an economic and design assessment for the proposed Port Welshpool Marina.

Council is currently managing the Corner Inlet Tourism Development Project. The Project will be undertaken in a number of stages, which include:

- Extension of the Great Southern Rail Trail (currently underway)
- Redevelopment of the Port Welshpool Long Jetty
- Port Welshpool Marina Development (this project)
- Toora Channel Dredging
- Agnes Falls Redevelopment (currently underway).

The main components and opportunities associated with the proposed marina development are described as follows.

The proposed development involves the construction of a new Marina through the use of a portion of the existing car park near the former Ferry Terminal. The land and water facilities at Port Welshpool are jointly managed by Council, Gippsland Ports and the Department of Sustainability and Environment, and input from these stakeholders will be critical in ensuring a successful outcome.

The development has the potential to leverage significant positive economic impacts for the Port Welshpool Township and broader region, including construction-related benefits (local contractors and businesses), direct and indirect employment benefits, increased visitation and tourism spending, and generation of new marine and tourist-related businesses such as boat services, accommodation, cafes/restaurants, gift shops, tours etc.

Importantly, the marina will provide another safe haven for vessels in the region, noting that Port Welshpool is a significant attractor for boat owners and their visitors.

It is recognised that the project will require considerable financial and planning input from Council, State and Federal governments, and the private sector; therefore, a robust economic and design analysis is required to ensure the project's viability is suitably assessed.

Objective

The objective of the study, as highlighted on page 36 of the study brief, is to:

“Prepare an Economic and Design Assessment of the proposed Port Welshpool Marina to establish the framework and viability of the project as part of the Corner Inlet Tourism Development Project”.

This Report

This report contains the following chapters:

- Chapter 1: **Context Assessment** – Describes the local and regional study areas, highlights the role of Welshpool and Port Welshpool townships, and describes the Corner Inlet Tourism Development Project of which the proposed marina development is a key component.
- Chapter 2: **Literature Review** – Presents an overview of key State and local policies and strategies relevant to this project.
- Chapter 3: **Concept Design** – Describes the preliminary design concept and presents a technical assessment (topography, bathymetry, geotechnical and water quality), and an environmental conditions review. Based on this analysis alternative options are assessed and a preferred concept recommended.
- Chapter 4: **Market Assessment** – Provides an analysis of the market for a marina at Port Welshpool with respect to supply of existing and planned marina berths and facilities in other locations and key demand drivers associated with recreational boating.
- Chapter 4: **Economic Impact Assessment** – Presents an assessment of employment, investment, visitation and other economic impacts arising from the marina development, together with Return on Investment and Benefit Cost Analysis under three operating scenarios.
- Chapter 5: **Recommended Design, Funding and Management Structure** – Provides advice on development funding, lease arrangements and management structure.
- Chapter 6: **Key Findings** – Presents a summary of the main findings of this assessment.

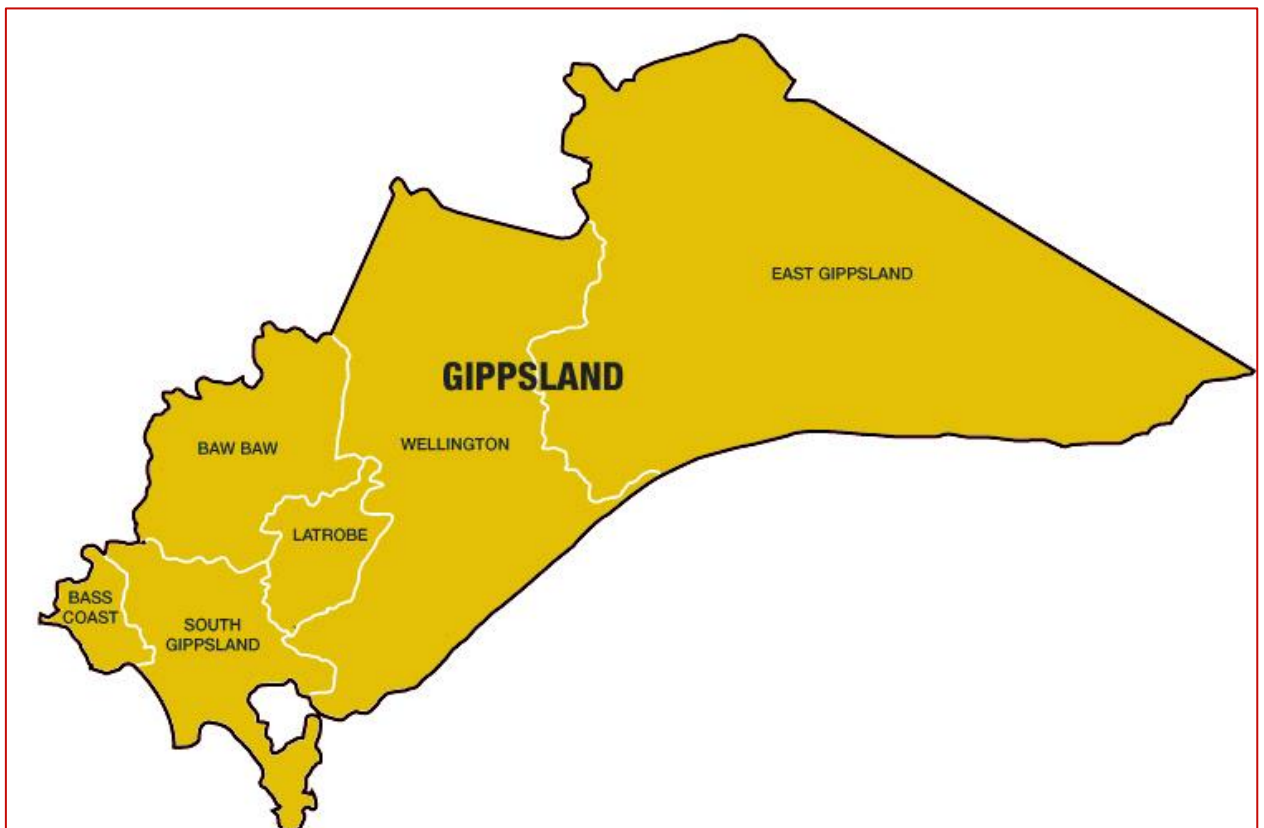
1 CONTEXT ASSESSMENT

1.1 Regional Overview

South Gippsland Shire is located in Gippsland and is surrounded by the Local Government Areas (LGAs) of Bass Coast to the west, Baw Baw to the north, Latrobe to the north-east and Wellington to the east, as shown in Figure 1.1. According to ABS 2013 Estimated Resident Population (ERP) data, the combined population of these adjoining LGAs is 220,310 persons, with the population of the whole Gippsland region (which also includes East Gippsland Shire) being approximately 263,720 persons.

South Gippsland Shire has a population of approximately 27,930 persons (ABS ERP, June 2013), with the municipality's main settlements being Leongatha (5,330 people), Korumburra (4,370 people), Mirboo North (2,300 people) and Foster (1,680 people). Welshpool has a population of 440 people and Port Welshpool a population of 180 people. This small town data is sourced from the 2011 ABS Census of Population and Housing.

Figure 1.1: Regional Study Area



Source: <http://www.rdv.vic.gov.au>

1.2 Local Study Area

The Local Study Area, as shown in Figure 1.2, is considered to be the townships of Port Welshpool and Welshpool which have a combined population of 620 persons.

Figure 1.2: Local Study Area



Source: <http://www.southgippsland.vic.gov.au>

Welshpool

Welshpool is located on the South Gippsland Highway, approximately 22 km south of Foster. The township has a small number of commercial businesses located with frontage to the highway, including a café/sandwich bar; hotel/motel (9 units accommodating approximately 20 persons); small supermarket; petrol station; rural sales; opportunity shop; and kitchen manufacturer. Prom Port Cottages, located just off the Highway on Port Welshpool Road, offer 3 units which accommodate a maximum of 15 persons. The golf course is located further along Port Welshpool Road. In addition, a boat storage and bait supplier business is located approximately 2km outside Port Welshpool, and this business services the storage needs of the local area. Images of Welshpool are included in Figure 1.3.

In 2011, Welshpool had 211 resident workers (or 48% of the population), with many involved in farming, construction, accommodation, cafes/food services.

Figure 1.3: Welshpool



Source: <http://www.travelvictoria.com.au/portwelshpool/photos>

Port Welshpool

Port Welshpool is the only natural deep sea port east of Western Port Bay and is sheltered from most weather by Wilsons Promontory, Big Snake and Little Snake Islands. The Port is located at the entrance to Corner Inlet and offers good views of the Promontory. Port Welshpool is well-known for its productive fishing grounds and as a base for the local fishing fleet, as well as wildlife cruises.

Port Welshpool's commercial activity, which is mainly focused on Lewis Street, comprises a general store, The Pier Port Hotel, a Maritime Museum, boat storage, and a garage. Many of the townships residents are involved in commercial and recreational fishing. A large number of retired residents live in the township, and this is reflected in the median age of 61 years with 40% of residents aged over 65 years in 2011. Only 36% of Port Welshpool's residents were in the workforce (65 resident workers) at the last Census, and these workers were mainly involved in retail, accommodation, farming, road transport and construction. Images of Port Welshpool are shown in Figure 1.4.

Figure 1.4: Port Welshpool



Source: <http://www.travelvictoria.com.au/portwelshpool/photos>

Port Welshpool's overnight accommodation comprises:

- Long Jetty Caravan Park – located on Port Welshpool Road and comprising approximately 100 sites and cabins
- Port Welshpool Caravan Park – located on Lewis Street and comprising approximately 20 sites and cabins
- Port Hideaway holiday house – sleeps up to 8 persons
- Victoria's Secret holiday house – sleeps up to 5 persons
- Blue Oar Cottage holiday house – sleeps up to 6 persons

Over recent years a significant loss of commercial activity has occurred in Port Welshpool, including a reduction in the size of the fishing fleet, closure of the local abattoir, removal of the Seacat Tasmania ferry service (from Port Welshpool to Georgetown, Tasmania), and closure of the historic Long Jetty.

These factors have contributed to a decline in local population, workforce and visitors. This decline highlights the importance of maximising the township's remaining assets – particularly the Port and foreshore – so as to stimulate new economic activity.

1.3 Corner Inlet Tourism Development Project

This project comprises five separate tourism-related infrastructure projects, described as follows:

- The Great Southern Rail Trail extension from Foster to Welshpool
- The restoration of the Port Welshpool Long Jetty
- The dredging of the Toora Channel for boating and recreational activities
- Agnes Falls visitor facilities upgrades
- A feasibility study including detailed design of a marina at Port Welshpool

The four projects have many synergies which have the potential to boost visitation and economic development in this part of South Gippsland Shire. Council will allocate funds ranging from \$1.5 million and \$2.1 million across the projects, with further funding sought from State and Commonwealth governments and the private sector.

Each project is briefly described below.

Great Southern Rail Trial Extension

This project involves extending the existing Leongatha-Foster 49km trail, shown in Figure 1.5, from Foster to Welshpool. The extension is approximately 18.5km in length and is estimated to cost approximately \$2.9 million. The project will involve the following stages:

- Section 1: Foster to Toora, involving construction of 8.6km of trail, with four bridges and associated infrastructure including signage, safety crossings, seating and bike parking.

- Section 2: Toora to Agnes, involving construction of 4.54km of trail, with three bridges and associated infrastructure.
- Section 3: Agnes to Welshpool, involving construction of 5.33km of trail, with five bridges and infrastructure.

State funding of \$2m was announced for the project from the Regional Growth Fund in 2012, with Council providing the remaining \$900,000. Works commenced on the Foster to Toora section in February 2013 and were completed in August 2013. The continuation of the rail trail between Toora and Welshpool is in the detailed design phase, with the project expected to be finished by 2015.

In view of the popularity of the existing rail trail with cyclists and walkers, it can be expected the extension of the route to Welshpool will provide an opportunity for nearby townships such as Port Welshpool to capture new visitors, especially if the visitor 'offer' is enhanced through infrastructure projects like the proposed marina development.

Figure 1.5: Great Southern Rail Trail



Source: www.railtrails.org.au

Restoration of Port Welshpool Long Jetty

The Port Welshpool Jetty is a heritage-listed 906m jetty which was constructed in 1938. In the past the jetty was used for recreational and commercial fishing and attracted a large number of boaters and visitors. The jetty was closed in 2003 and is now in state of disrepair. Figure 1.6 provides an image of the existing redundant jetty.

Various options for restoration of the jetty have been examined and the preferred option is estimated to cost approximately \$15 million. The restoration project involves the following:

- Stage 1: Rehabilitation of the two pile trestle
- Stage 2: Rehabilitation of the jetty to its pre-1982 condition

The restoration of the jetty aims to:

- Provide a minimum working life of 25 to 30 years
- Maximise pedestrian accessibility
- Provide significant environmental and heritage features of the Long Jetty
- Optimise commercial, recreational, tourism and industry development opportunities.

The project is currently at the detailed design phase, with funding being sought from the Federal Government to support commitments from the State Government (\$5 million) and South Gippsland Shire Council (\$1 million).

Port Welshpool Jetty is located approximately 1km east of the proposed Port Welshpool marina at the entrance to the township. In view of its historic significance, restoration of the jetty is likely to have synergistic benefits with the marina development by stimulating new boating related activity and encouraging higher levels of visitors to the township.

Figure 1.6: Port Welshpool Long Jetty



Source: <http://www.travelvictoria.com.au/portwelshpool/photos>

Toora Channel Dredging

The Toora Boat Ramp, which is shown in Figure 1.7, has two launching bays, one of which is flanked by a pontoon. The Toora Jetty Road connects the Boat Ramp to the Toora Township. The access channel servicing the Boat Ramp was created by dredging approximately 20 years ago. This channel links the boat ramp with the main Toora Channel which allows access for small motor boats to the Corner Inlet area for fishing and recreational activities. Both the boat ramp and the access channel are located within the Corner Inlet Marine and Coastal Park, and are also located within the Corner Inlet Ramsar Wetland area. As a Ramsar site, it is deemed to be an area of national importance under the Commonwealth Environment Protection and Biodiversity Conservation Act.

The access channel requires regular maintenance to ensure safe boating; currently, the boat ramp can only be used by small vessels one hour either side of high tide as the approach to the boat ramp is shallow. This significantly restricts boat access to Corner Inlet from Toora.

Council has proposed channel dredging be undertaken at the Toora Boat Ramp involving the use of a barge to dredge sediments from the floor of Toora Channel. The estimate cost of the dredging is \$500,000. If these works are approved by the relevant State and Federal regulatory authorities, dredging will result in significantly improved access to the Toora Boat Ramp and a considerable increase in boat launching and associated fishing and recreational activity in Corner Inlet.

Increased boating activity facilitated by improved access from the Toora Boat Ramp will be beneficial to the broader region, including Port Welshpool, as this will support increased visitation to the Corner Inlet area.

Figure 1.7: Toora Boat Ramp



Source: South Gippsland Shire Council

Agnes Falls Redevelopment

Agnes Falls, located within the hills of the Strzelecki Ranges, are the highest single span falls in Victoria at 59 metres. Agnes Falls is a popular walking, viewing and picnicking area which attracts many visitors all year round to experience the picturesque gorge and its surrounds, as shown in Figure 1.8.

In July 2013, the Minister for Environment and Climate Change announced \$180,000 funding to improve visitor facilities and help protect the environment at the Agnes Falls Scenic Reserve. Works will include the installation of a new toilet and visitor shelter. A site master plan will also be developed that will include options for an improved lookout area to view the falls and details to help guide the reserve's future management. All works are expected to be completed by the end of 2014.

In April 2014, Council announced plans for a \$400,000 new cantilever platform at Agnes Falls. The platform will protrude five metres into the gorge, offering visitors a 180 degree views and will include a section of mesh floor that will enable visitors to look straight to the gorge below.

Council is currently seeking co-funding from RDV for this project.

Figure 1.8: Agnes Falls, Toora



Source: lifegames.com.au/agnes-falls/

Port Welshpool Marina

The Port Welshpool Marina development proposal is focused on a marina development on land owned by Council and located around the existing car park near the former Port Welshpool ferry terminal. The development aims to provide a major economic boost to the

town and result in significant flow-on effects for the benefit of existing and new businesses. The development would have a secondary benefit of improved safety, as it would provide another safe haven for vessels.

Overall, the Port Welshpool Marina will provide a major attraction for the region and support visitation benefits associated with the other four projects that form part of the Corner Inlet Tourism Project.

This study will provide the key direction to guide the marina development.

1.4 Summary

1. Port Welshpool is located in the Gippsland population catchment which includes approximately 265,000 persons, and provides a strong base for recreational boating demand.
2. The local study area includes the settlements of Welshpool and Port Welshpool which have a combined population of 620 persons and offer a limited range of visitor facilities.
3. Port Welshpool is significant in terms of commercial and recreational boating activities as it is generally well-sheltered, provides a natural deep sea port, and is attractive in terms of fishing stocks and wildlife.
4. The proposed Port Welshpool Marina development is one of five projects included in the Corner Inlet Tourism Development Project which is an initiative of South Gippsland Shire Council. Together with the Great Southern Trail Extension, restoration of Port Welshpool Long Jetty, dredging of Toora Channel and Agnes Falls Redevelopment, the marina development aims to boost economic development and tourism in this part of the Shire.

The following chapters examine marina design concepts with regard to policy support, market demand, and environmental, technical and financial feasibility.

2 LITERATURE REVIEW

This Chapter presents an overview of key State and local policies and strategies relevant to this project including the Victorian Coastal Strategy, Gippsland Boating Action Plan, Port Welshpool Strategy Plan, and Council's Economic Development and Tourism Plan and Priority Projects document.

2.1 Victorian Coastal Strategy 2008

The Victorian Coastal Strategy was prepared in 2008 by the State Government and provides a comprehensive integrated management framework for the coast of Victoria under the terms of the Coastal Management Act 1995. The Act directs the Victorian Coastal Strategy to provide for long-term planning of the Victorian coast for the next 100 years and beyond.

The purpose of the strategy is to provide (p5):

1. A vision for the planning, management and use of coastal, estuarine and marine environments
2. The government's policy commitment for coastal, estuarine and marine environments
3. A framework for the development and implementation of other specific strategies and plans such as Coastal Action Plans, management plans and planning schemes
4. A guide for exercising discretion by decision-makers, where appropriate.

With regard to boating, the strategy notes the following (p48):

- Boating is an important recreational and social outlet for many people. Boat registration is increasing faster than population growth. The size of boats is increasing, as is the demand for launching and retrieval and for boat storage facilities.
- The boating industry contributes significantly to employment and economic activity in Victoria, with direct expenditure on boating of \$1.4 billion in 2005, as well as contributing to the wider community's health and enjoyment of the coast (Central Coastal Board, 2007).
- Economically important commercial fishing fleets, diving vessels, tourism operations and marine management, research, and search and rescue boats also operate from boat ramps and facilities along the coast.
- It is important to understand and strategically manage the increasing demand for new and improved boating facilities. Safe access to, from and on the water is required, while ensuring impacts on the natural environment and coastal processes are minimised. The safety of boat users and swimmers is paramount.
- The high capital and maintenance cost of infrastructure to support boating activities remains a challenge for coastal planners, managers and community-based clubs and groups. Balancing these needs with those of other coastal user groups and the ongoing pressure for commercial development will become an increasing challenge.

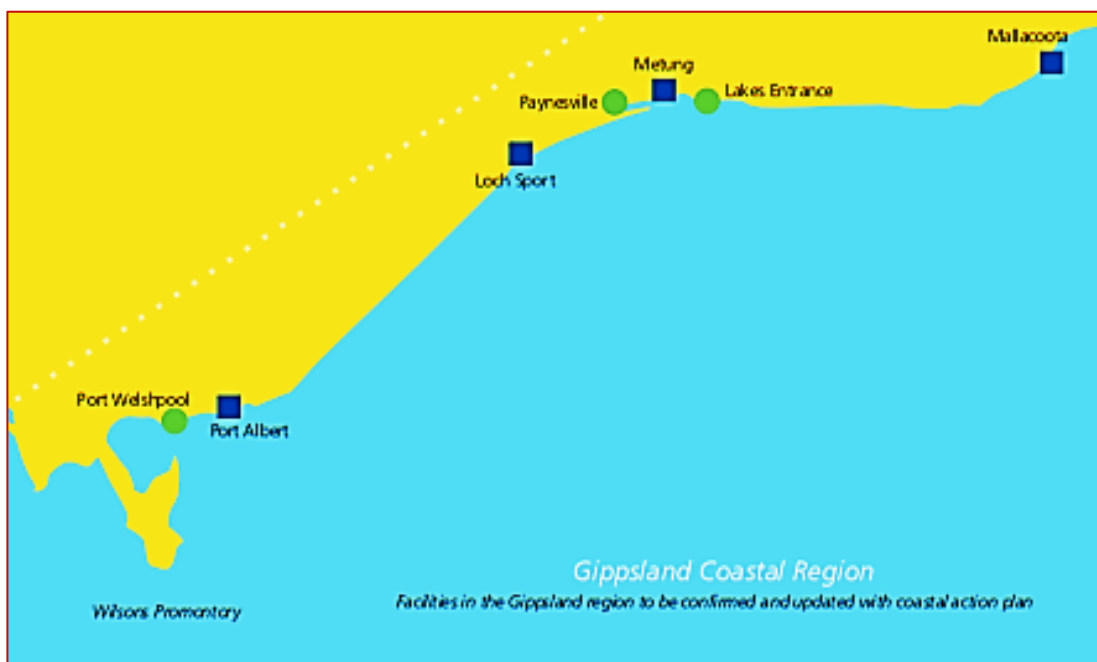
Policy

1. Strategically plan for and deliver sustainable boating facilities and infrastructure on the coast via Coastal Action Plans that respond to a demand assessment, safety considerations, the protection and sustainable management of coastal processes, conservation objectives, and quality of experience for all beach users.
2. The protection and sustainable management of coastal processes, conservation objectives, and quality of experience for all beach users.
3. Provide new access and review existing inappropriate access in accordance with the recreational boating facilities hierarchy (refer to Figure 2.1).
4. Ensure the provision of effluent disposal facilities at strategic boating locations to address illegal sewage discharge from boats.

The Victorian Coastal Strategy provides a hierarchy of boating facilities in the Gippsland Coastal Region and identifies Port Welshpool, together with Paynesville and Lakes Entrance, as State Marine Precincts. These localities are shown in Figure 2.1.

A State Marine Precinct incorporates facilities of international, national, state, regional and local significance. These include ports, marinas, charter boat facilities, slip facilities, waterfront activities, marine services, piers, jetties and ramps. Such locations are anticipated to generate major investment to harness and use the synergy of facilities.

Figure 2.1: Gippsland Coastal Region – Boating Hierarchy, Victorian Coastal Strategy 2008



Source: Victorian Coastal Strategy 2008

2.2 Gippsland Coastal Boating Action Plan 2013

The Gippsland Coastal Action Plan 2013, provides strategic guidance for managing recreational boating and associated infrastructure and facilities in the Gippsland region.

The key issues identified are:

- Climate change and sea level rise
- Coastal planning and management
- Boating and the natural environment
- Dredging
- Ocean access
- Boating and local communities
- Competition between users
- The adequacy of current facilities
- The potential role of new technologies.

The strategic directions for recreational boating in the Gippsland region are:

- To develop a coordinated network of facilities
- Make boating safer, enjoyable and available to users of all abilities
- To ensure the long-term sustainability of facilities
- To provide a coordinated management approach.

These directions aim to ensure that recreational boating facilities are located where:

- They are supported by appropriate onshore facilities
- They do not impact adversely on the natural environment
- They can be maintained effectively and efficiently

The Gippsland region has been split into three boating areas: South Gippsland (in which Port Welshpool is located); Gippsland Lakes; and East Gippsland.

The draft Action Plan confirms the recreational boating facilities hierarchy included in the Victorian Coastal Strategy, and which classifies Port Welshpool as a Regional Boating Precinct.

With respect to Port Welshpool, the following is noted (p44):

Role

Port Welshpool is a significant commercial port servicing the offshore oil, gas and fishing industries, as well as being a popular recreational boating area. It is well-positioned for recreational boating, and with the potential to accommodate more boating activity. However, Port Welshpool does not yet have the community facilities and land-based attractions to

support a state marine precinct – the classification given to it in the *Victorian Coastal Strategy* – but could grow to function as a regional boating precinct in the next five years and onwards.

Figure 2.2 identifies the level of service that might be expected at a regional boating precinct, and these requirements should be considered with respect to the design of Port Welshpool Marina and associated land and water-based facilities.

Figure 2.2: Recreational Boating Facilities Hierarchy, Gippsland Coastal Boating Action Plan 2013

The following elements are generally provided at each level of service in the hierarchy:
 ✓ Required ● Optional x Not required

Typical components	Level of service					
	State marine precinct	Regional boating precinct	District boating facility	Local boating facility	Basic boating facility	Informal boating facility
Access						
Safe harbour	✓	●	●	x	x	x
Public access	✓	✓	✓	✓	✓	✓
Car parking	✓	✓	✓	✓	✓	●
Car access to beach	x	●	●	●	●	●
Disabled access	✓	✓	●	●	x	x
Launch and retrieval						
Boat ramps	✓	✓	●	●	●	x
Pier/jetty	✓	●	●	●	●	x
Berthing						
Public berths (itinerant)	✓	✓	●	x	x	x
Wet berths	✓	●	●	●	x	x
Dry berths	●	●	●	x	x	x
Mooring jetties	✓	✓	●	●	x	x
Swing moorings	●	●	●	●	●	●
Commercial shipping facilities	●	●	●	x	x	x
Supplementary services						
Fuel	✓	●	●	x	x	x
Pump-out	✓	✓	●	●	x	x
Toilets	✓	✓	✓	●	x	x
Wash down	✓	✓	●	●	x	x
Fish cleaning	●	●	●	●	●	x
Security	✓	✓	●	x	x	x
Signage	✓	✓	✓	✓	✓	●
Service utilities (power/water/lighting)	✓	✓	✓	●	x	x
Recreational/tourist facilities						
Capacity for major public boating events	✓	●	x	x	x	x
Boat hire/charter	✓	●	●	x	x	x
Commercial vessel berthing facilities	✓	●	●	x	x	x
Community facilities (including club rooms)	✓	✓	●	●	x	x
Recreational facilities (picnic tables, BBQs)	✓	✓	●	●	●	●
Retail or entertainment and land based uses/attractions	✓	●	x	x	x	x
Maintenance						
Boat repair and servicing	✓	●	●	x	x	x
Chandlery / boating retail	✓	●	●	x	x	x

Source: Gippsland Coastal Boating Action Plan 2013

Existing facilities

Existing facilities include a three-lane boat ramp with an alongside jetty and a floating jetty at the end, supported by a large parking area. The position of the ramp creates conflict between commercial and recreational waterway users. Wet berths are also available on several jetties. The recreational boating facilities at Port Welshpool are well used throughout the year, with most of the use being for launching and retrieval of powerboats. Users identified that boat launching could be made more efficient through better design of the launching area and car park.

The Long Jetty at Port Welshpool is closed to public access at present. South Gippsland Shire Council is seeking funding for its reopening with a general recreational and tourism focus.

Future planning and development

A marina has been proposed for Port Welshpool along with other projects to provide increases recreational boating capacity. Development of a Foreshore Management Plan for Port Welshpool would enable these proposals to be evaluated in conjunction with town planning and infrastructure requirements, as well as considering environmental and climate change issues that may affect the town.

Table 2.2 and Figure 2.3 outline Port Welshpool’s facilities, management and current and future roles.

Table 2.2: Port Welshpool – Facilities, Management and Current and Future Roles

Location	Facility	Manager	Current role	Future role
Port Welshpool	Three ramp lanes	South Gippsland Shire	District	Regional
	Jetty (Marginal Wharf)	Gippsland Ports	District	
	Jetty (Catwalk Jetty)	Gippsland Ports	District	
	Jetty (Fisherman’s Jetty)	Gippsland Ports	District	
	Jetty (Ferry Terminal Jetty)	Gippsland Ports	District	
	Jetty (Long Jetty)	Gippsland Ports	Closed	<i>To be determined by facility manager</i>

Source: Gippsland Coastal Boating Action Plan 2013

Figure 2.3: Port Welshpool – Key Coastal Facilities



Source: Gippsland Coastal Boating Action Plan 2013

2.3 Port Welshpool Strategy Plan

The Port Welshpool Strategy Plan 2005 (Urban Initiatives) was prepared to guide development over a 10-15 year period with the aim of realising the town's substantial potential.

The following attributes of the township were noted (p vii):

- Excellent direct access to protected and ocean fishing waters
- Close proximity to several outstanding natural areas including Wilsons Promontory, Corner Inlet and the Strzelecki foothills
- Important port for the commercial fishing of the eastern waters of Bass Strait
- High quality natural setting
- Town contains a full range of urban infrastructure as well as substantial areas with development potential
- Excellent access available from the main touring route linking Westernport/South Gippsland to the Latrobe Valley/Gippsland Lakes areas and further east.

The study notes that Port Welshpool has the potential to become a boating and recreation destination of State significance, which – through its location, assets and accessibility – is likely to attract increasing levels of tourism and recreational activity over the coming decades.

An Action Plan program was developed which included the following components:

- Projects for immediate / medium-term implementation include:
- Establishment of the Village Green and an upgrade of the former ferry terminal building for mixed government, community and commercial use
- Foreshore improvements, particularly under-grounding of power-lines in Lewis Street
- Upgrading of the boat launching facilities
- A rolling program of street improvements and landscaping
- Establishment of a recreational pathway network in and around the town

Priority strategic actions included:

- Definition of the Gippsland Ports boat maintenance area and preparation of a site masterplan
- Investigation of options for the development of a marina adjacent to the Long Jetty
- Detailed planning and design of long term improvements required to the public boat launching area
- Preparation of a program of Planning Scheme amendments to implement as strategic policy contained in the plan

The Port Welshpool Strategy Plan was not adopted by Council, and therefore the actions outlined above are provided for information purposes only and do not represent commitments by South Gippsland Shire Council.

2.4 South Gippsland Shire Economic Development and Tourism Study 2012-17

The South Gippsland Shire Economic and Tourism Study was prepared by Council in 2012 and covers the five-year period 2012-17.

The strategy is based on the following three Strategic Directions:

- Strategic Direction 1: Business Attraction and Development
- Strategic Direction 2: Supportive Business Environment
- Strategic Direction 3: Promotion, Marketing and Networks

The strategy recognises that tourism is one of the most important sectors for the Shire's economy, supporting a wide range of business activities including accommodation, retail and cafes, as well as having a role to play in attracting new residents to the area (ie relocate after positive visitor experiences in the Shire).

The strategy recognises Port Welshpool's boating facilities are key tourism asset for the Shire.

The Corner Inlet Tourism Development project (which includes the Port Welshpool Marina development) is seen as critical to providing new or refurbished infrastructure assets that will provide long-term support for the tourism industry.

This Corner Inlet Tourism Development project has been identified as a strategic investment and infrastructure priority for Council.

2.5 South Gippsland Shire Council – Priority Projects

In September 2012, South Gippsland Shire Council prepared a document "*Priority Projects for Support – Coming Together to Plan our Future and Build our Dreams*".

The document identifies projects and initiatives which are priorities for the communities of South Gippsland Shire and for which funding partnerships are sought with state and federal government to support committed Council funding.

The Corner Inlet Tourism Development Project, of which the Port Welshpool Marina project is an integral part, has been afforded priority project status by Council. A total of \$2.1 million in Council funding has been allocated to the project in order to leverage significant additional funds from programs such as the State government's Regional Growth Fund and the Federal government's Regional Development Australia Fund (RDAF).

The inclusion of the Corner Inlet Tourism Development Project as part of a short list of just nine priority projects highlights the strategic importance of the project and sub-components (such as the Port Welshpool Marina) to the Shire.

2.6 Conclusion

Strong policy support exists for the development of a marina at Port Welshpool, this includes:

1. The Victorian Coastal Strategy which provides a hierarchy of boating facilities in the Gippsland Coastal Region and identifies Port Welshpool as State Marine Precinct.
2. The Gippsland Coastal Action Plan which highlights the significance of Port Welshpool as a commercial port and an important recreational boating area with potential to cater for more boating activity. While enhanced community facilities and land based attractions are required if it is to become a state marine precinct, Port Welshpool has the potential to become regional boating precinct in the short-term.
3. The South Gippsland Shire Economic and Tourism Study which identifies Port Welshpool's boating facilities as key tourism asset for the Shire. The development of Port Welshpool Marina as part of the Corner Inlet Tourism Development Project is also identified as important for the long-term economic regeneration of the area.
4. South Gippsland Shire Council's priority projects which identify the Corner Inlet Tourism Development project as a key strategic investment and infrastructure priority for Council and the community.

3 CONCEPT DESIGN

This Chapter presents a technical assessment of the study area and describes the development of a Preferred Design for the marina, including a description of design components, a technical assessment (topography, bathymetry, geotechnical and water quality), and an environmental conditions review. A number of alternative concepts have been developed and considered, and a preferred option recommended.

The new design for the harbour is required to accommodate the existing usages of the marginal wharf along the landward edge of the marina, and provide clear separation from the Gippsland Ports working area, as shown in Figure 3.1.

The Yarabah, seen along the angled jetty in the figure below has shifted to the Barry Beach marine terminal and the berth is currently not utilised. The berths along the eastern side of the angled jetty (highlighted) are able to be removed and incorporated into the new marina.

Figure 3.1: Existing Marina Uses



3.1 Design Overview

This design review has been completed in line with the guidelines set out in the Standards Australia's "Australian Standard: Guidelines for design of marinas" AS-3962-2001. The Standard "sets out guidelines for the design of marinas suitable for vessels up to 50m in length". This approach is considered suitable for the proposed marina at Port Welshpool.

The environmental conditions have been assessed and the general and extreme conditions in the vicinity of Port Welshpool described. The environmental conditions review is designed to assist in the identification of any potential issues which may present an obstacle to the marina design. Any potential mitigation options which may alleviate these potential issues, or improve the usability of the marina are noted.

3.2 Technical Assessment

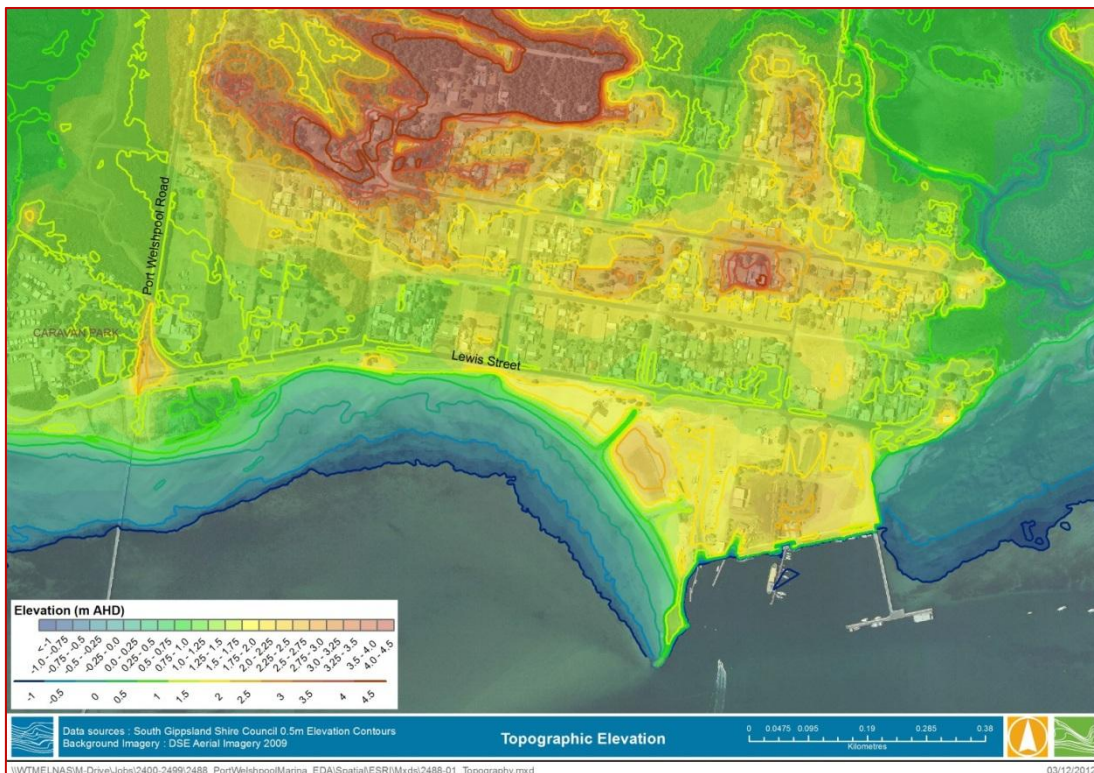
Port Welshpool Topography

Elevation contours have been provided by the South Gippsland Shire Council. The contours, provided in 0.5m steps have been used to create the digital terrain map (DTM) as shown in Figure 3.2. The figure illustrates the low lying nature of the township, with the majority of the properties along Lewis Street below 1.5m Australian Height Datum (AHD).

The land between Lewis Street and the basin of the Port Welshpool harbour was artificially nourished during development of the harbour, levels are between 1.75m AHD and 2.5m AHD around the existing ferry terminal building and carpark.

The intertidal banks to the east and west of the harbour area are visible, the shoreline sloping gently from 1.0m AHD at the back of the beach to -1m AHD at the extent of the topography shown. Significant beach nourishment with material dredged from the Lewis Channel has taken place to the west of the harbour and established the wide beach and vegetated sand dunes along Lewis Street and to the existing port area.

Figure 3.2: Port Welshpool Topography



Source: South Gippsland Shire Council

Bathymetry

Bed levels surveyed within the Port Welshpool boat harbour area during 2007 and 2012 are shown in Figure 3.3, provided by Gippsland Ports. The survey of levels was undertaken on 7th October, 1999 and 19th-20th April 2012. Levels are shown to Chart Datum (CD) which is 1.51m below (AHD).

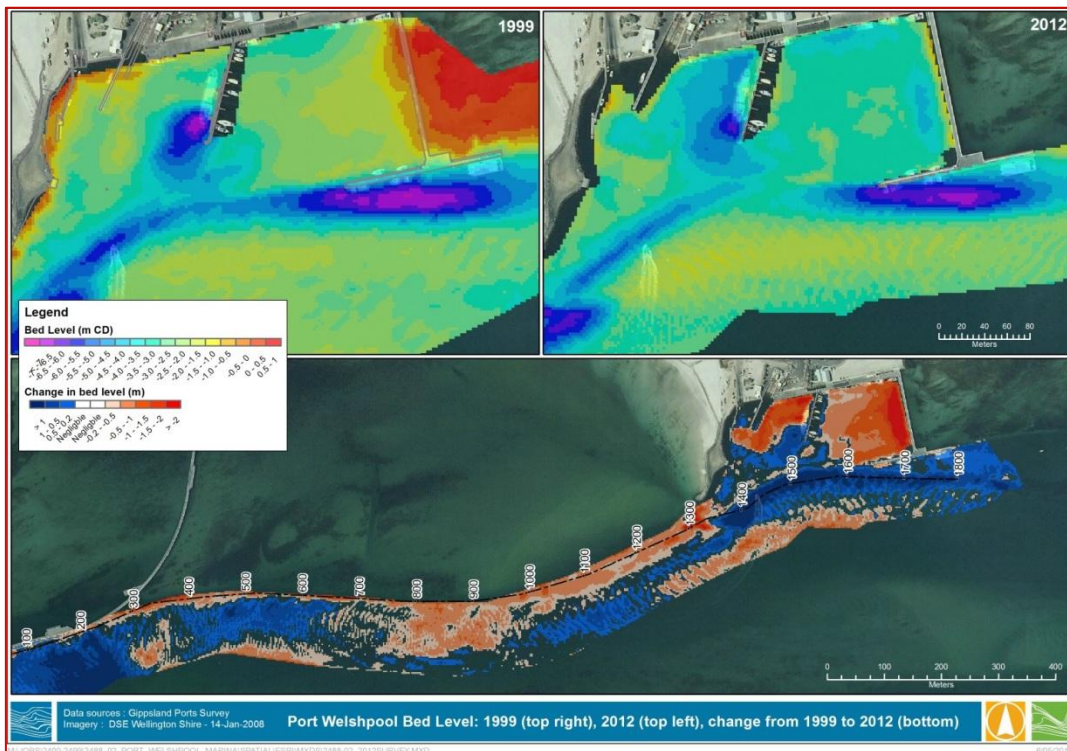
The survey shows depths within the harbour vary between -7.0m CD and 0m CD during 1999. Depths within the proposed marina area are mostly less than -2.5m CD, and along the Fisherman’s Jetty sediment has drifted westward from the shallow intertidal area into the harbour and the bed is exposed below the Jetty at low tides. On the south side of the Fisherman’s Jetty the channel is below -7.0m CD.

Dredging of the Lewis Channel and harbour area occurred during 2007 and included the over-dredging of the area adjacent to the Fisherman’s Jetty to form a silt trap within the marina area. This silt trap was included in the dredging design to allow sediment from east of the Fisherman’s Jetty to accumulate in the silt trap, reducing the frequency of future maintenance dredging. Evidence of the silt trap dredged in 2007 can be seen in the 2012 survey where depths along the Fisherman’s Jetty vary between -3.0m CD and -4.5m CD.

Elsewhere within the harbour a sand shoal is evident at the entrance and in the centre of the new marina area in the 2012 image. These shoals are between -2.0 and -3.0m CD and are likely to be the result of deposition of the bed as sediment falls from suspension once in the sheltered area of the harbour. Infilling of the harbour area appears to be relatively slow.

On the southern face of the Fisherman’s Jetty there is an incised channel with depths of greater than -6.5m CD in parts. The distance from the Fisherman’s Jetty to the sand bar across the channel is 40 - 50m.

Figure 3.3: Port Welshpool Bathymetry (Gippsland Ports)



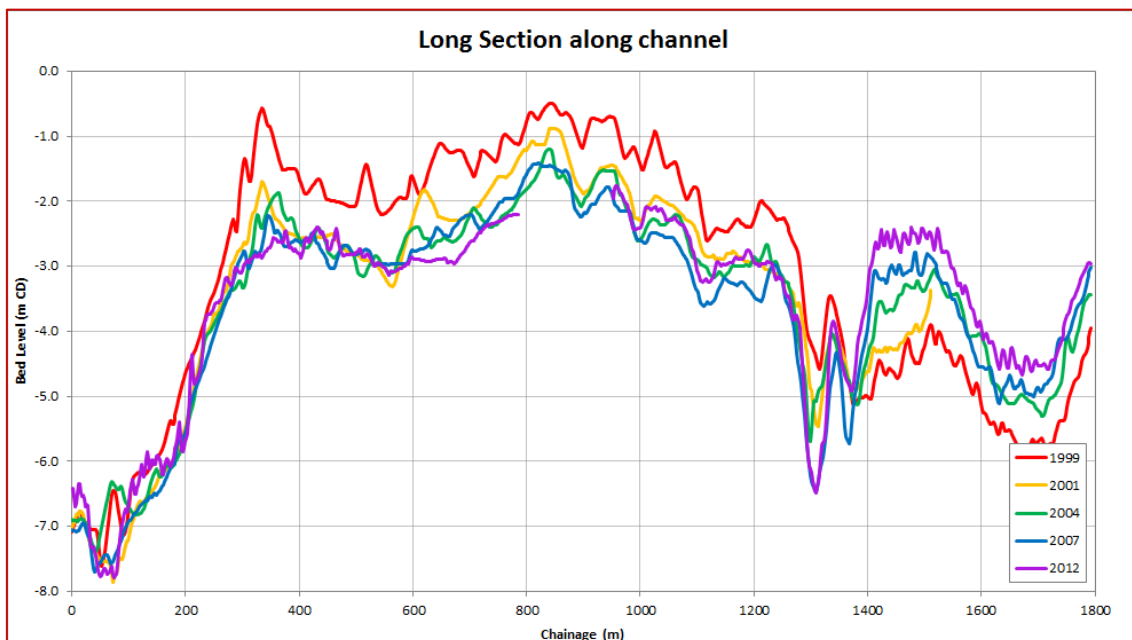
Change in Bed Levels

As shown above, Gippsland Ports undertakes bathymetric survey of the Lewis Channel and Port Welshpool harbour area on a regular basis. The bed surface levels recorded in 1999, 2001, 2004, 2007 and 2012 have been analysed to assess the variability and movement of the sediment in the area.

The long-term change between 1999 and 2012 is highlighted above in Figure 3.4. The image indicates the scour of the bed (red) and accretion of sand (blue). The strong red path on the northern side of the survey area indicates that there has been significant (1m – 2m) scour of the main tidal, or a shift in the channel alignment between the Long Jetty and the harbour area. Adjacent to the harbour area the strong blue path indicates there has been significant (1m – 1.5m) infilling of the tidal channel in this area and some associated scour of the sand bar south of the channel.

Further analysis of the change between each survey (refer to appendices) indicates there is gradual accretion adjacent to the Long Jetty. Scour of the Lewis Channel west of the breakwater occurs between 1999 and 2001. To the east of the breakwater, accretion can be seen in the Lewis Channel between 1999 and 2001. A long section of the bed level through the channel is shown in Figure 3.4 highlights the jump from the 1999 survey (red) to 2001 (orange) west of the harbour breakwater where the profile remains largely stable for the 2004, 2007 and 2012 surveys. Adjacent to the harbour breakwater the channel has become shallower between 1999 and 2012 in the area between the rock breakwater and the angled jetty. Further east and adjacent to the Fisherman's Jetty levels remained constant between 2004 and 2007 before infilling slightly to 2012.

Figure 3.4: Change in Bathymetry Cross Section, 1999 – 2012 (Gippsland Ports)



Source: South Gippsland Shire Council

Geomorphology

Port Welshpool is located on the seaward side of an early Pleistocene coastal barrier, indicating the position of the shore front during the last interglacial high (approximately 100,000 years ago) (Victorian DPI, 2007). As sea levels fell, successive coastal dunes were formed and the area around Port Welshpool subsequently comprises a number Pleistocene quartzose dune ridges interspersed with swampy corridors (Bird, 1993). As shown in Figure 3.2, the shoreline at Port Welshpool is very low, with a low backshore ridge separating the intertidal area from the lower, vegetated corridor landward of the town.

Sediments

Previous dredging operations have been supported by sediment sampling and analysis of material within the harbour area (Kowarsky, 2003). The sediment analysis indicated that the material within the harbour is predominantly fine sand (0.125 – 0.25mm diameter), although there was evidence of a higher concentration of fines (i.e. silts or clays, diameter less than 0.063mm) along the edge of the wharf frontage. Samples were taken from the surface and 0.5m below the bed.

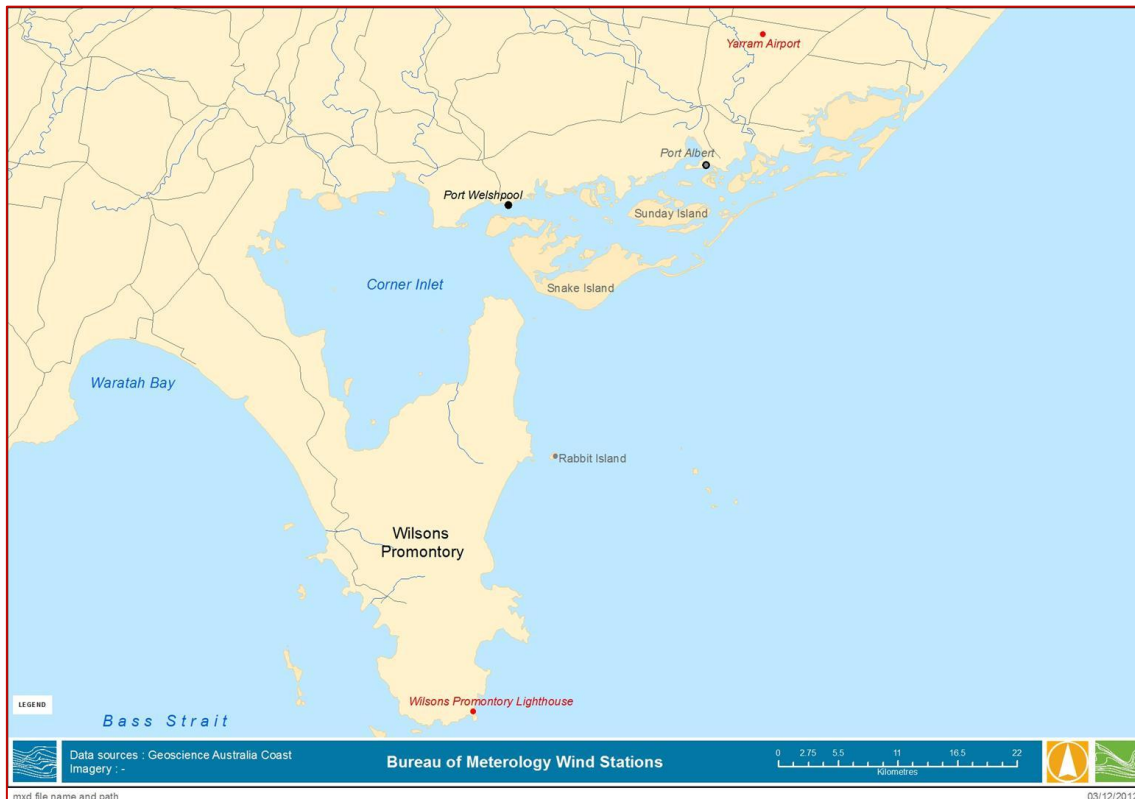
Visual inspection of the sediment material to the west and east of the site indicated predominantly fine sand. The area to the east of the marina contains substantial patches of seagrass which had formed stable platforms within the intertidal area, drained by defined channels. In contrast, the sandy beach to the west of the harbour area has a typical concave beach shape with a gentle sloping face. Sand dredged from the Lewis channel and the harbour area is deposited on the beach to the west.

Physical Oceanography

The physical oceanography of Port Welshpool is influenced by a range of factors that impact the conditions at the marina site. The following sections describe the contributions that different physical phenomena make to the overall hydrodynamic variability observed at Port Welshpool.

Wind Climate

In the vicinity of Port Welshpool, winds are recorded by the Bureau of Meteorology at the Wilsons Promontory Lighthouse and Yarram Airport. The location of the gauges in relation to Port Welshpool is shown in Figure 3.5.

Figure 3.5: Location of Wind Data Stations

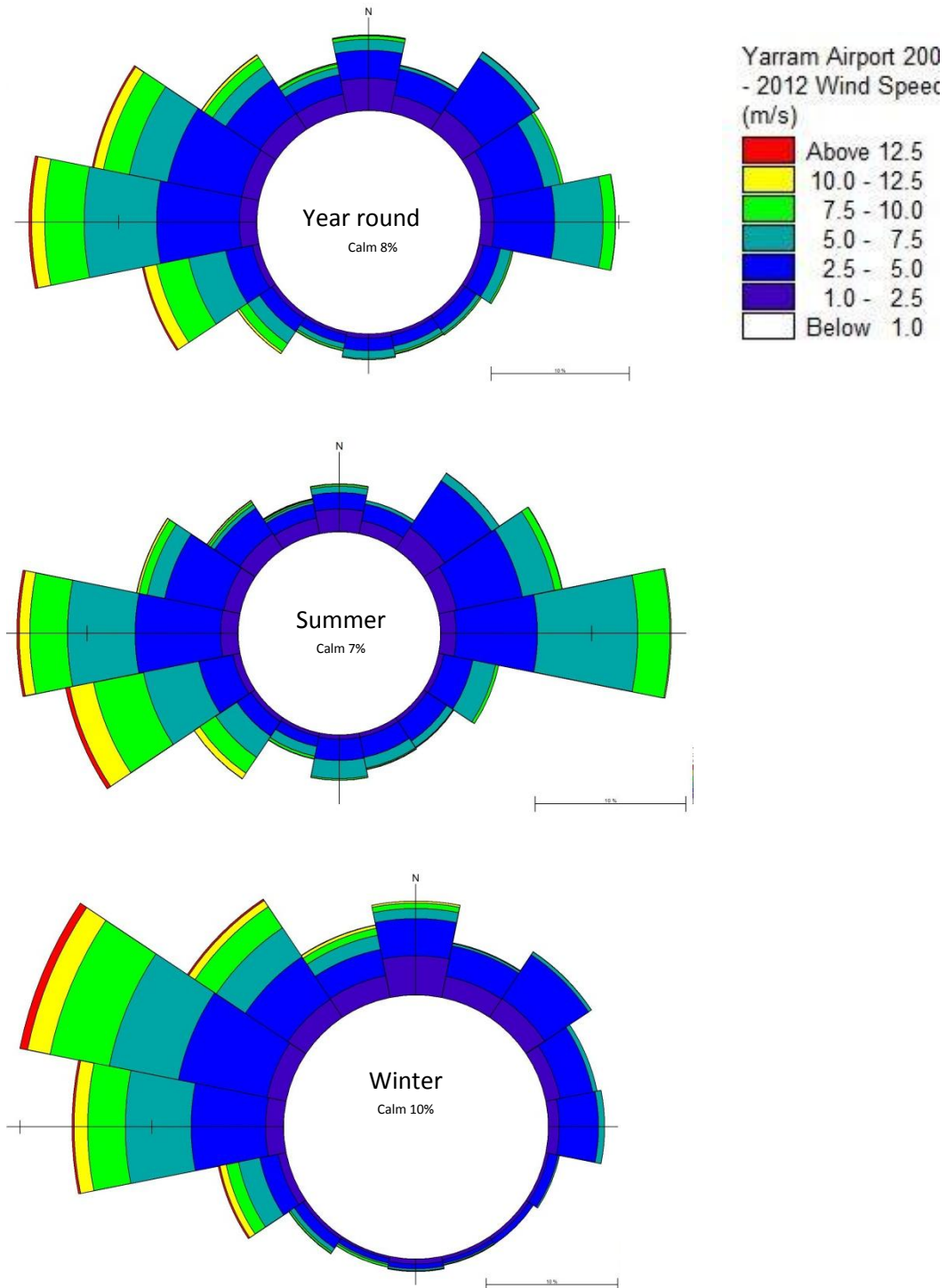
Source: South Gippsland Shire Council

Wind data has been recorded at the Wilsons Promontory lighthouse since 1957, with data for the period 2000 to 2008 assessed for this study. The Wilsons Promontory Lighthouse anemometer sits on an elevated and exposed headland on the southeast coast of the Promontory. There is considerable local acceleration to the gauge which leads to an overestimation in local wind speed by 20% or more.

Data has been recorded at Yarram Airport since 2007 and provides a more useful picture of the variation of wind across Corner Inlet and the Nooramunga National Park area to the east of Port Welshpool.

The stations record half-hourly observations of six minute average wind speed and direction. Year round, summer and winter wind speed and direction rose plots are presented in Figure 3.6.

Figure 3.6: Seasonal Distribution of Wind Speeds and Directions at Yarram Airport (2007 – 2012)



Source: Bureau of Meteorology

Features of the wind climate at Yarram Airport can be summarised as follows:

- Wilsons Promontory protects the Corner Inlet area from the strong westerly winds. At the Yarram station, winds are from the west around 15% of the time and only a small proportion is above 10m/s.
- Winds in summer have a more significant north-easterly and south westerly component compared to the winter months.
- Winds in winter have a strong westerly component, with an increased north-west proportion of wind. Average winter wind speeds are higher than the summer winds.

While the wind climate experienced at Port Welshpool is expected to be closer to those measured at Yarram, wind conditions have a strong influence on the type and distribution of currents and waves within Corner Inlet, and the conditions at Wilsons Promontory may be of use when considering the offshore conditions within Bass Strait.

Design Winds

Design winds have been estimated using the Australian Standards “AS/NZS 1170.2:2002 *Structural Design Actions – Part 2: Wind Actions*”. The 1 and 50 year ARI hourly average wind speeds are shown in Table 3-1. The hourly wind speeds are converted from the 3 second gusts provided by AS/NZS 1170.2:2002 using the relationship developed by the USA Core of Engineers *Coastal Engineering Manual* (USACE, 2003). These hourly average wind speeds have been used in modelling described below.

Table 3.1: Design Wind Conditions (Australian Standards & USACE)

Wind Direction	Hourly Average Wind Speed (m/s)	
	1 year ARI	50 year ARI
East	13.8	20.7
East Southeast	13.8	20.7
Southeast	13.8	20.7
South-southeast	14.2	21.3
South	14.6	22.0
South-Southeast	15.5	23.3
South West	16.4	24.5
South-Southwest	16.8	25.2
West	17.2	25.8

Source: AS/NZS 1170.2:2002 & USACE, 2003

Wave Climate

Port Welshpool is protected from large swell waves generated in the Southern Ocean and Bass Strait by Wilsons Promontory, the narrow entrance to Corner Inlet and the intertidal banks and channels within the inlet. The median annual significant wave height outside of the entrance is less than 1.5m (Water Technology, 2004). Median annual wave periods offshore are less than 9 seconds.

Any larger oceanic swell waves reaching Corner Inlet will develop within the Tasman Sea during east coast low events. Waves have been recorded at offshore oil platforms east of Corner Inlet at heights greater than 8.0m significant. Offshore of the Corner Inlet entrance, storm wave heights may exceed 4m significant, however much of the wave energy will be dissipated through the narrow Corner Inlet entrance channel, and on the tidal shoals around the entrance.

Within Corner Inlet, wind driven waves will be limited by the available fetch (distance wind can blow across the open water) to Port Welshpool. The largest fetch, to the east of the site across the Middle Ground is very shallow, with depths less than 1m below low water restricting the growth of unbroken waves to a fetch of approximately 5km. Design wave heights across a fetch of this length could be expected to be around 1.0m significant, with a peak period of around 3.5 seconds (USACE Shore Protection Manual, 1984).

Astronomical Tides

The astronomical tides are generated by the gravitational attraction and relative motions of the earth, moon and sun. Astronomical tides within Corner Inlet and at Port Welshpool are semi-diurnal (two tides a day) with a minor diurnal inequality. The spring tidal range at Port Welshpool can be quite large and varies between 2.0 and 2.3m. Neap tide range is in the order of 1.2 to 1.3m.

Tidal water levels at Port Welshpool are derived from 2 years of data collected by Gippsland Ports between 2001 and 2003. Standard water levels at Port Welshpool are shown in Table 3.2.

Table 3.2: Water Levels at Port Welshpool

	Tidal Elevation (m AHD)
HAT	1.3
MHWS	0.9
MHWN	0.6
MSL	0.0
MLWN	-0.6
MLWS	-1.0

Source: Australian National Tide Tables, 2013

Tidal currents

The tide approaches Port Welshpool from both Lewis Channel to the west and Middle Bank Channel to the east. The tidal divide (where the two incoming tides meet) is located approximately 4.5km east of Port Welshpool. The tidal current speed reduces from a maximum at the entrance to Corner Inlet to virtually nothing at the tidal divide. Currents through the Lewis Channel and adjacent to Port Welshpool are in the order of 0.5 – 1.5m/s (Kowarsky, 2003).

Extreme Water Levels

Estimates of extreme coastal water levels (storm tides), including the impact of the projected sea level rise, have been developed by the CSIRO (2009) for different planning and sea level rise scenarios and are displayed in Table 3.3 for Port Welshpool.

The term *storm tide* refers to coastal water levels produced by the combination of astronomical and meteorological ocean water level forcing. The meteorological component of the storm tide is commonly referred to as *storm surge* and collectively describes the variation in coastal water levels in response to atmospheric pressure fluctuations and wind/wave setup.

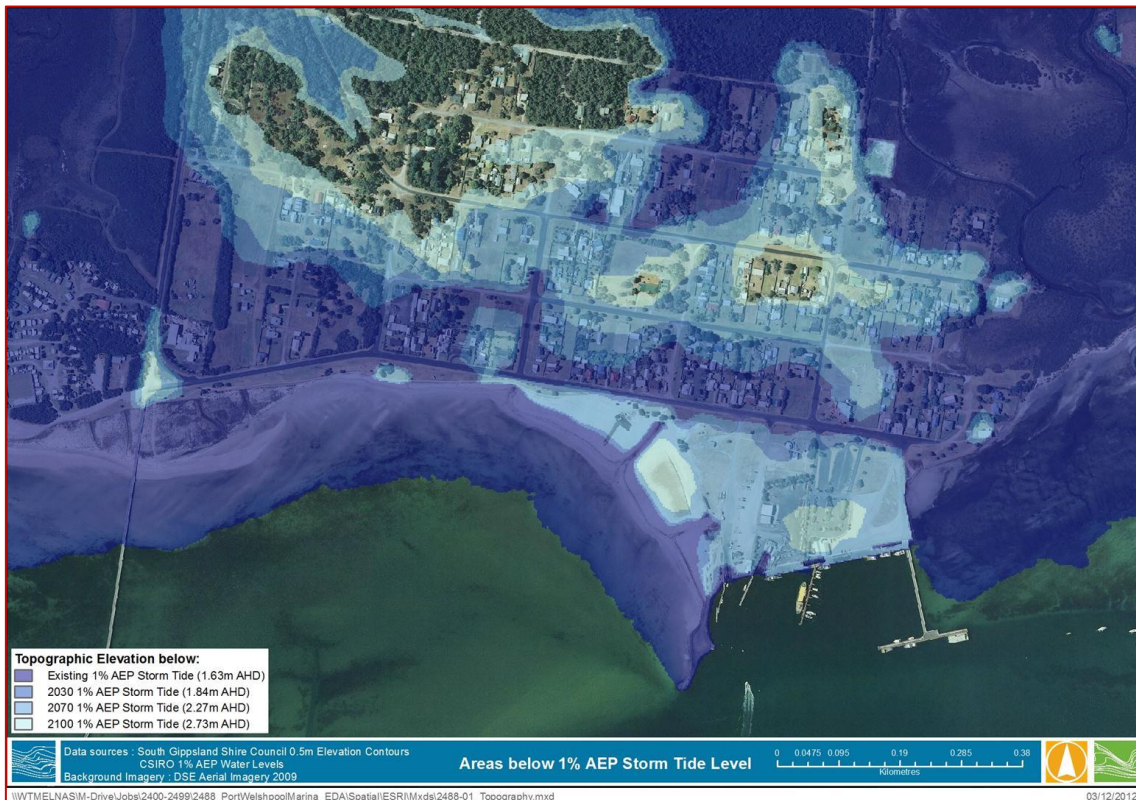
The areas at or below the existing and projected 1% Annual Exceedance Probability(AEP) storm tide levels are shown in Figure 3.7. The image shows levels below the 1% AEP storm tide level only and should not be considered as modelled flood levels. However, there is evidence that much of the township at Port Welshpool is currently at risk of inundation from the existing 1% AEP storm tide, as shown in the dark blue area. All but isolated patches of the township are below the projected 2100 1% AEP level – the area shown in pale blue.

Table 3.3: AEP Storm Tide Levels Incorporating Mean Sea Level Rise Scenarios

	Existing (m AHD)	2030 High (m AHD)	2070 High (m AHD)	2100 High (m AHD)
Port Welshpool (10% AEP)	1.35	1.55	1.96	2.45
Port Welshpool (1% AEP)	1.63	1.84	2.27	2.73

Source: CSIRO, 2009

Figure 3.7: Port Welshpool Elevation below 1% AEP Storm Tides



Source: South Gippsland Shire Council

Coastal Processes

Little analysis has been undertaken in the past to assess the coastal processes at Port Welshpool. Historical aerial photography found in Kowarsky (2007) has been reviewed to provide information on the general changes of the Port Welshpool town and harbour area.

Key features from each of the images area described below:

1941

- The Long Jetty and the Fisherman's Jetty have been constructed and partially constructed respectively;
- The Lewis Channel is well formed with visible tidal shoals and channels, as well as some sand wave patterns;
- Little to no beach is apparent above the high water mark along the Port Welshpool foreshore.

1952

- The Fisherman's Jetty has been completed to the existing extent;
- The harbour breakwater has been constructed, along with the northern harbour wall. The bed of the harbour basin has not been dredged;
- Considerably more seagrass is evident in the intertidal areas;
- The sand bar near the long jetty appears to have increased in size and the main Lewis channel has migrated to the south;
- The area covered by vegetation has increased on the sand bar south of the Fishermans Jetty.

1984

- The harbour hardstand area has been filled and the basin has been dredged. A large sand wedge is visible within the harbour appears to be spreading westward from the shallow banks to the east of the Jetty;
- Significant sediment volume has accumulated/been deposited on the western edge of the harbour breakwater. A beach above the high water mark appears to have been established in the landward end of the breakwater;
- The channel to the east of the Fisherman's Jetty appears to be less defined than previously and the sand bar flatter and wider;
- The sand bar south of the Long Jetty has continued to grow and both the channel and sand bar have continued to migrate south;
- Less seagrass or vegetation is evident within the intertidal areas.

1991

- An additional jetty has been added in the centre of the harbour basin (the angled jetty);
- The harbour basin sand bar observed in the previous image is no longer visible;
- Channels east of the Fishermans Jetty are well defined and it appears dredging has also been undertaken along the bar to the east;

- Additional areas of beach above the high water mark are evident along the Lewis Street foreshore and adjacent to the breakwater. The area previously noted as being new beach has been colonised by vegetation;
- The channel to the immediate south of the Long Jetty has been dredged through to the main channel approach to Port Welshpool. The sand bank in this area has continued to increase in size;
- An increase in the area of seagrass and vegetation is evident in the intertidal zones.

1997

- Additional works (car-parking, vegetation) have been completed on the harbour hardstand area;
- There is evidence of siltation occurring within the harbour basin;
- Increased areas of vegetation on the beach west of the breakwater is evident, and the area of beach above the high water mark appears to have increased;
- The area of seagrass/vegetation on the island to the south of the harbour area has increased significantly.

2009 (DSE Imagery)

- The carpark area of the hardstand has been paved and further development (buildings) are evident;
- The harbour appears to have been dredged and a 50m long vessel is moored at the angled jetty. A dredged cut is visible to the east of the Fisherman's Jetty;
- The sandy beach above the high water mark has remained approximately constant in area. An excavator/dump truck is visible and sand management operations are being undertaken. This suggests dredging has recently been completed and dredged sand was deposited on the beach area;
- The original main channel south of the Long Jetty appears to be infilling at the eastern end and the dredged channel becoming the primary tidal flow route;
- Sea grass/vegetation cover has increased to the east of the Fisherman's Jetty but reduced on the sand bar to the south.

Water Quality Conditions

Water quality around Port Welshpool is generally considered to be good, and conditions are maintained by the enhanced tidal flushing through both Corner Inlet and the Nooramunga area to the east.

High rainfall and subsequent high flow events in the catchments supplying Corner Inlet and Nooramunga can result in a temporary lowering of water quality within the coastal water bodies. The high flow events are usually accompanied with high concentrations of nutrient and sediment inflows; however, these are usually diluted by the tidal inflows within a short period.

3.3 Potential Design Constraints

Table 3.4 describes the impact of the environmental conditions detailed above on the design of the marina at Port Welshpool. Potential mitigation options are noted and included in the alternative designs.

Table 3.4: Environmental Conditions Review

Condition	Impact	Mitigation
Topography		
	Much of the land within Port Welshpool is at or below a level of 1.63m AHD, equivalent to the existing 1% AEP return water level.	The ground surface level of Port Welshpool and surrounding areas may present a risk for the project which cannot be mitigated without extensive capital works.
	By 2030 access to the Port Welshpool marina and township could be expected to be cut during the 10% AEP storm tide event.	Construction within the marina, including the dry berth area, should be to levels above the existing 1% AEP flood tide level with freeboard to allow for future rises in sea levels.
Bathymetry		
	Sediment has been shown to accumulate within the main body of the proposed marina area. This will impact the size of boats which can safely access the marina.	Maintenance dredging and/or over dredging during the capital works phase may reduce the impact of sedimentation within the marina basin.
	Sediment has been shown accumulating in the area east of the Fisherman's Jetty since the original works were completed at Port Welshpool. This accumulation has, at times, spilled westwards into the new marina area preventing safe berthing of vessels.	A physical barrier or significant over dredging will be required in the design of the marina to prevent the ingress of sand from east of Fisherman's Jetty.
	The intertidal area in the area to the east of the marina has a significant covering of seagrass. Works within this area to prevent sediment ingress into the marina (such as dredging) may cause loss of habitat for a number of species.	Detailed study will be required to determine the risks and consequences associated with any removal of the seagrass. This may pose a risk to the development as the site is located within a RAMSAR wetland.
	Sediments within Lewis Channel can shift and cause the channel to become too shallow for navigation of deeper vessels.	Gippsland Ports currently undertakes dredging of Lewis Channel every 4 – 5 years. This maintenance dredging would need to be maintained to continue access to the new marina.
Geotechnical		
	Information on the subsurface material is not readily available for the marina area. The condition of the subsurface material will have an impact on the constructability of the marina and piling.	A detailed geotechnical investigation should be carried out following the Economic Feasibility Study. Corings within the marina and along the proposed alignment of the wave attenuator will enable further design decisions to be made. As the geotechnical conditions are unknown at this time, there is potential risk to the design and cost of the harbour until this information has been established.
	The makeup of material to be dredged is not readily available and removal and	A detailed geotechnical investigation should be carried out following the Economic

Condition	Impact	Mitigation
	subsequent disposal of this material may present issues.	Feasibility Study. Corings and sediment analysis within the marina area will enable further design decisions to be made. The disposal of dredged material requires a number of State Government approvals. Whilst this could be a risk , dredging and dredge material disposal has been completed in the past and such there is some precedent for works within the area.
Wind Climate		
	Strong winds may cause excessive loading on boats and berthing infrastructure.	Stability analyses can be carried out in detailed design to ensure maximum wind speeds are allowed for.
	Strong winds may cause higher waves, water levels and stronger currents through Corner Inlet and around Port Welshpool, putting pressure on structures, vessels and inundating infrastructure.	Stability analyses can be carried out in detailed design to ensure maximum waves and currents are allowed for. Extreme water levels caused by storm surge can be allowed for in detailed design.
Wave climate		
	No measured wind or wave data is available at Port Welshpool, and as such conditions described in this report may under or overestimate the wave climate within the harbour.	A wave monitor should be established at Port Welshpool prior to detailed design. A good record (1 – 2 months) of measured wave data will allow calibration of numerical modelling and a more accurate determination of the wave climate.
	Waves impacting navigation to and from the marina are likely to come along Lewis channel from the west.	Aligning the entrance channel so boats are running with the westerly wave until in the lee of the wavescreen will reduce navigational hazards.
	Waves from the west may reflect off the inside of the marina and cause unacceptable water level variations at the berths	This can be addressed and reflection of waves reviewed within the detailed design phase.
	To maintain a “Good” wave climate, waves should be less than 0.3m within the harbour area.	Construction of wave attenuator and wavescreens along the existing jetty will prevent direct wave action within the harbour. Further work should be completed in the detailed design phase to ensure there are no internal reflections or seiching issues created within the harbour.
Water Levels		
	The 2m tidal range at Port Welshpool will require adequate draft to be provided during the low tide.	Adequate draft can be provided during capital dredging of the marina.
	The 2m tidal range may cause the access to the floating pontoons to become hazardously steep.	Longer access ramps can be designed to ensure recommended maximum grades are not exceeded.

Condition	Impact	Mitigation
Tidal currents		
	Relatively strong tidal currents can cause strong forces on the vertical wavescreeens along the jetty.	Detailed design of the wavescreeens will be required to ensure currents do not cause excessive forces on the walls. Detailed design will also assess the likelihood of scour at the bed of the wall and the implications of scour on stability.
Extreme Water Levels		
	Much of the Port Welshpool township and access to the town will be inundated by the existing 1% AEP and 2030 10% storm tide events.	This may present a risk to the project.
Sediment Transport		
	Sediment from the beaches to the east and west of the marina may be suspended during larger wave energy events. This sediment may be transported into the harbour area and settle out in the calm waters.	Physical barriers, maintenance and/or over-dredging can prevent/manage sedimentation of the harbour.
Water Quality		
	Corner Inlet is a RAMSAR listed area and accidental spills within the proposed marina may have significant impact on both Corner Inlet and the Nooramunga National Marine Park.	Well maintained emergency response systems can help to mitigate the impact of accidental spills within the harbour. Proper maintenance and response guidelines should be developed during detailed design.
	Increased levels of antifouling paint may cause an impact on marine life.	There is little that can be done to mitigate the leaching of antifouling paint from the hulls of vessels. Further investigation during detailed design can assess the specific risks associated with anti-fouling material.

3.4 Concept Designs for Consideration

Aim of Alternative Concepts

Alternative concept designs for the Port Welshpool marina have been assessed to both investigate means of mitigating, or managing, the risks identified in the Technical Assessment, and to test the initial design for suitability. The key items of consideration for design are:

- Inundation of the low lying land around the development site by extreme water levels;
- Wave conditions within the harbour to provide safe mooring;
- Sediment transport into harbour from the eastern intertidal area;
- Sufficient berthing volume for cost feasibility.

The inundation of the low lying site can be mitigated by increasing the design floor level to provide a freeboard above the 1.63m AHD existing 1% AEP storm tide. Additional freeboard above future storm tides can also be incorporated in the detailed design phase. Council has advised that the current inundation of access roads to Port Welshpool will be managed with rises in sea levels and access will continue to be provided to the town under extreme weather events.

Alternative Concepts

A number of features are required in each alternative concept:

Dry Storage: The provision of dry storage at Port Welshpool was identified as a feature which should be incorporated into all of the alternative concepts.

Dry storage is a popular facility at many marinas, particularly with owners of small to medium trailer boats. Dry storage can increase the number of effective “berths” without large initial capital costs, and can begin as a low level facility with a securely fenced area and tractor to transfer vessels to the boat ramp before progressing to a higher level facility with multitier undercover dry storage and a number of forklifts in operation to a dedicated launch site, and additional boat service offerings such as cleaning and repair as demand increases.

Dry storage will be located within the existing car park area and mast-up transfer of boats to the existing boat ramp provided.

Obstruction to Sediment Transport: Sediment transport from the eastern intertidal area into the marina basin will occur unless an impermeable barrier is positioned along the eastern side of the marina. A barrier will also act as a wavescreen along the eastern side of the existing jetty to reduce the incidence of easterly waves entering the harbour during high tides. It is likely (although geotechnical data may deem otherwise) that construction of a rock or geotextile sand bag will be a more cost effective option than a full depths wavescreen with associated scour protection.

The alternative concepts reviewed during the project are shown in Figure 3.8. The positives and negatives of each concept design are listed in Table 3.5.

Figure 3.8: Alternative Harbour Concept Designs



Table 3.5 Positive and Negative Aspects of Concept Designs

Option	Components	Positive Aspects	Negative Aspects
Purple	150m wavescreeen Potential for 40-60 new berths	Increased wave protection for larger area of existing harbour Utilises existing infrastructure Additional deep berths provided on south side of eastern wavescreeen	Minimal extra berthing provided by western wavescreeen Large walking distance to berths at end of eastern wavescreeen Not a total separation of Ports and public areas
Yellow	130m wavescreeen Potential for 30-50 new berths	Greater wave protection for larger area of existing harbour Utilises existing infrastructure Additional deep berths provided on southern side of western wavescreeen	Minimal extra berthing provided by western wavescreeen Entrance navigation could be hazardous for larger boats Not a total separation of Ports and public areas
Green	105m wavescreeen Potential for 40-60 new berths	Greater wave protection for larger area of existing harbour Utilises existing infrastructure Minimal additional infrastructure required Additional deep berths provided on south side of wavescreeen	Large walking distance to berths at end of eastern wavescreeen Not a total separation of Ports and public areas
Orange	500m rubble mound breakwater Large volume of new berths	Complete separation of public and Gippsland Ports areas Dredging of reclaimed land/previous dredge spoil material No dredging of seagrass More opportunity for integrated marina facilities (eg club house) Provides a large area suitable for a Stage 2 berthing	Loss of public beach Much larger development including construction of breakwater and dredging of basin Limited opportunity for staging
Blue	400m wavescreeen Large volume of new berths	Greater wave protection for existing area of harbour Utilises existing infrastructure Provides a large area suitable for a Stage 2 berthing	Large walking distance to berths at end of wavescreeen Large costs for long wavescreeen in deeper waters Limited opportunity for staging whilst providing good wave protection of berthing areas Not a total separation of Ports and public areas
Dry Storage (not shown on map)	Hard stand area and tractor to launch and retrieve boats Low demand – secure fenced area, use of public boat ramp High demand – Dry stack building, multitier storage, dedicated launching place (not shown)	Suits boats less than 12-13m Suits most trailer boats which are common in region Cheaper (for both owner and users) than wet storage Reduces need for hull cleaning (and therefore prevalence of harmful antifouling paints in water) Easily staged to grow with demand Reduces trailer traffic into Port Welshpool Reduces congestion at boat ramp Creates employment opportunities	Uses up existing carparking/park area Requires staff Could be deemed unsightly

3.5 Preferred Design

Following discussions with Council and stakeholders, a variation of the “Green Option” has been deemed to provide the best configuration for the new marina. The elements of the preferred option are described below and illustrated in Figure 3.9.

Feature drawings of the marina are provided in the appendices.

Features of the design include:

- A significant number of new wet berths;
- A new dry berth area with capacity for over 50 boats and mast up storage and access to the public boat ramp;
- Commercial berths along the Marginal Wharf have been retained;
- Additional large/commercial berths have been retained along the outside of the Fisherman’s Jetty (as current condition);
- A number of temporary berths are provided along the inside of the Fisherman’s Jetty (as currently available) and along the landward side of the new walkway;
- The berths along the existing angled jetty have been removed and provision for boats currently moored along this facility provided for in the new layout;
- A wide berthing mix has been provided with a range of smaller (10m) and larger boats (up to 20m) able to be accommodated.

Structural components of the design include:

- A primary walkway, connected via gangway to the existing Jetty;
- Three secondary walkways allowing access to the newly constructed berths;
- A floating wave attenuator extending 150m from the existing Fisherman’s Jetty westward to provide the bulk of wave protection to the marina;
- A supplementary floating wave attenuator extending 10m from the angled jetty to provide additional wave protection to berths from west-southwest waves;
- A vertical wavescreen of approximately 100m length adjacent to the existing Fisherman’s Jetty to provide wave protection to the marina;
- A rubble mound or sand filled geotextile breakwater running parallel to the Fisherman’s Jetty to prevent infilling of the harbour by sediment.

Figure 3.9: Preferred Option

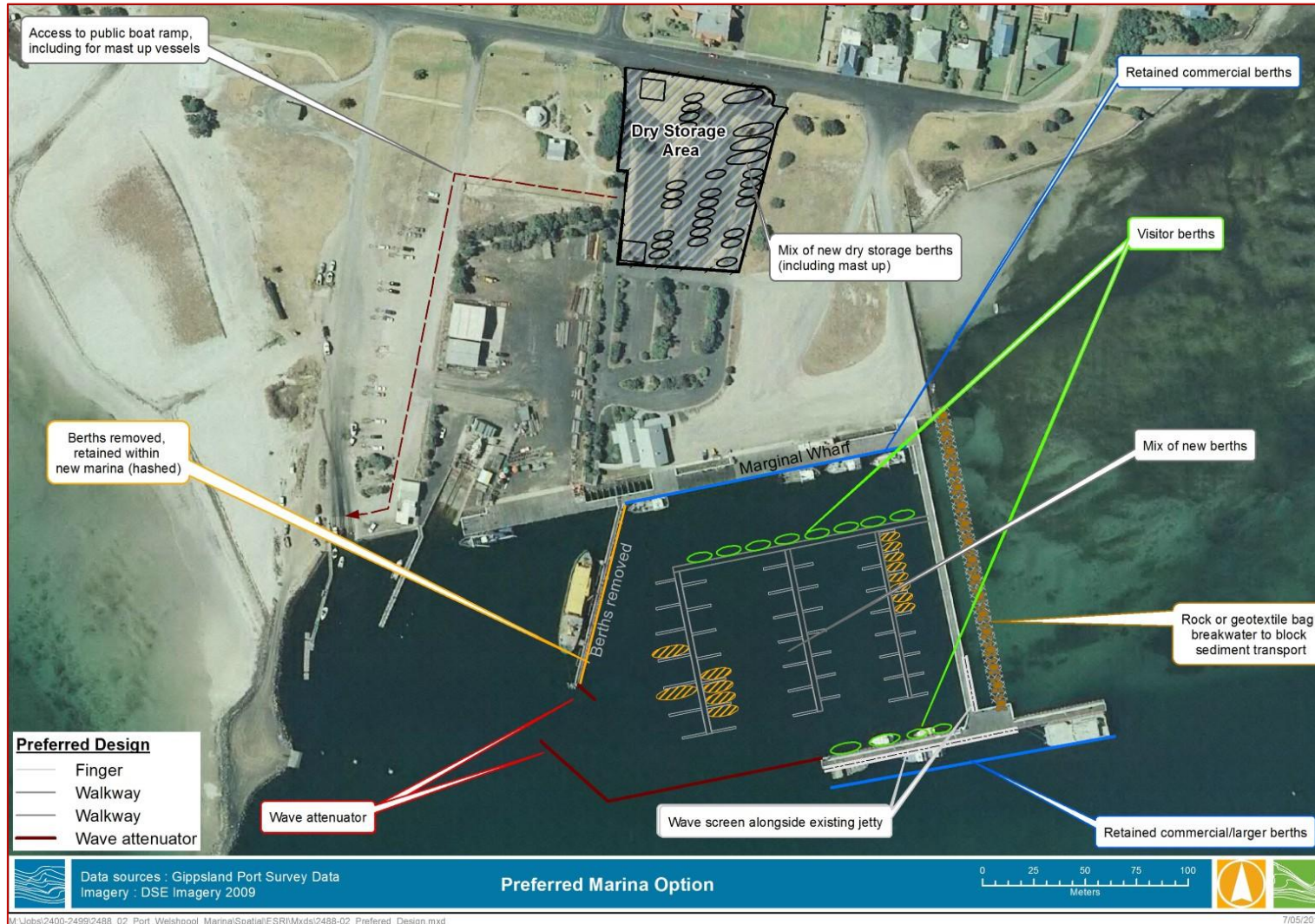


Table 3.6: Preferred Option Details

Item	Details
Wet Berths (permanent)	4 x 20m berth 2 x 18m berth 31 x 15m berth 27 x 12m berth 18 x 10m berth
Wet Berths (temporary/guest)	2 x 15m berth 8 x 12m berth 2 x 10m berth (or other combinations of similar)
Dry Berths	approx. 6,400 m ² area 330m fences 3 entry gates Office unit Tractor for transferring boats, storage shed for tractor
Wave attenuator	150 linear meter (southern section) 10 linear meter (angle jetty section)
Wavescreen	100 linear meter (on southern side of existing jetty) 40 linear meter (on eastern side of existing jetty)*
Breakwater	130 linear meter (on eastern side of existing jetty)

*to be established following geotechnical studies

Design Details

Preliminary assessment has been carried out to progress the design to the stage shown above. These assessments are briefly described below.

Wave Conditions

The length and configuration of the wave attenuator has been optimised using the Mike Spectral Wave model by DHI. It should be noted the use of this model is for preliminary assessment only and does not include the impacts of wave reflection within the harbour which could lead to increased wave conditions or standing wave patterns. This should be assessed during detailed design.

The wave modelling has used the 1 and 50 year ARI design wind conditions described above in Section 3.2 to assess the conditions within the harbour and optimise the length and position of the wave attenuator. The Australian Standards Guidelines for Design of Marinas (AS 3962-2001) provides details on the wave conditions within the harbour which should be met by a marina, as shown in Table 3.7.

Table 3.7 AS 3962-2001: Criteria for a “Good” Wave Climate in Small Craft Harbours

Direction and peak period of design harbour wave	Significant wave height (H_s)	
	Wave event exceeded once in 50 years	Wave event exceeded once a year
Head seas less than 2 s	Conditions not likely to occur during this event	Less than 0.3 m wave height
Head seas greater than 2 s	Less than 0.6 m wave height	Less than 0.3 m wave height
Oblique seas greater than 2s	Less than 0.4 m	Less than 0.3 m wave height
Beam seas less than 2 s	Conditions not likely to occur during this event	Less than 0.3 m wave height
Beams seas greater than 2 s	Less than 0.25 m wave height	Less than 0.15 m wave height

NOTE: For criteria for an ‘excellent’ wave climate multiply wave height by 0.75, and for a ‘moderate’ wave climate multiply wave height by 1.25. For vessels of less than 20 m in length, the most severe wave climate should satisfy moderate conditions. For vessels larger than 20 m in length, the wave climate may be more severe.

Source: Adapted from MERCER, A.G., ISAACSON, M. and MULCAHY, M.W. *Design wave climate in small craft harbours*. 18th Conference on Coastal Engineering, Capetown. 1982.

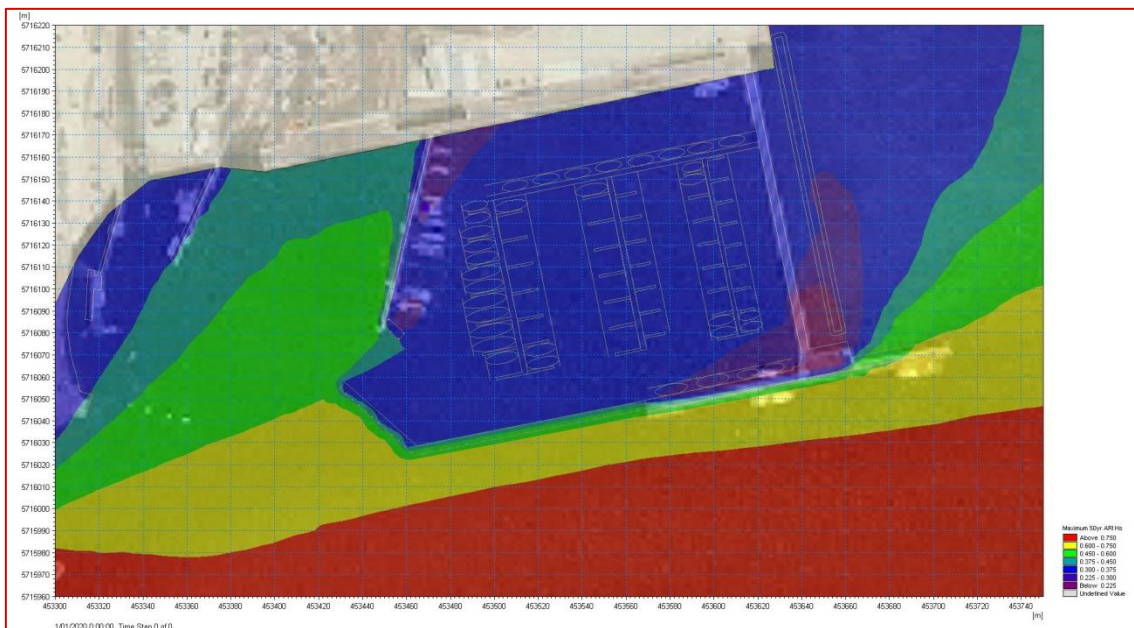
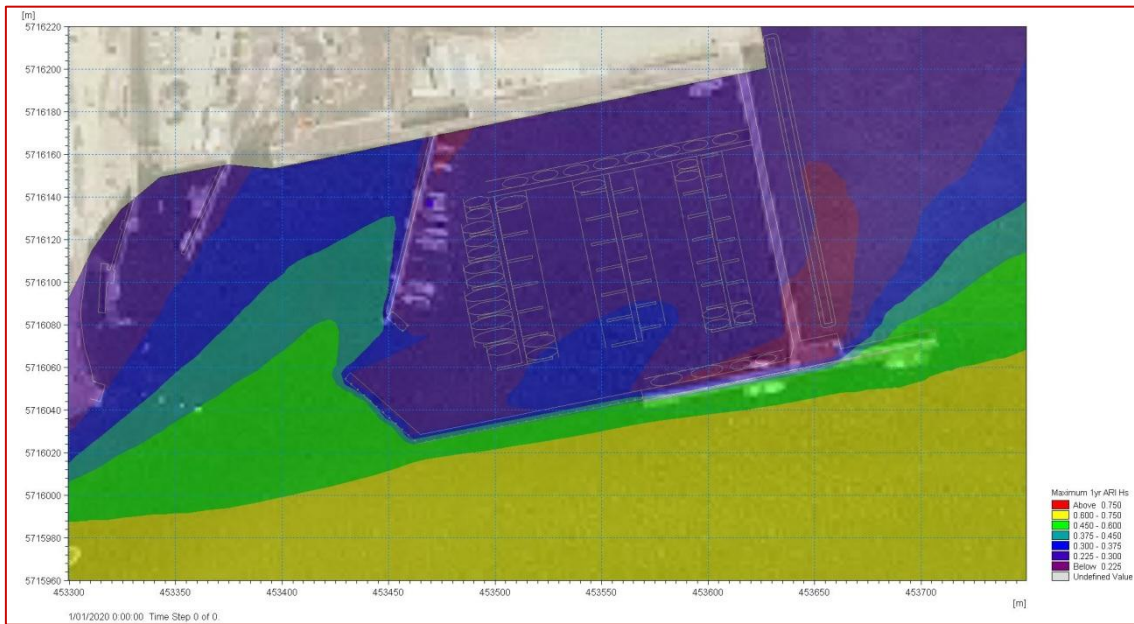
A number of assumptions have been made regarding the wave transmission properties of the floating wave attenuator, vertical wavescreeen attached to the pier and the adjacent breakwater based on construction information and published works (Bellingham Marine, 2004 & ASCE, 2012).

The results of the wave modelling are shown below in Figure 3.10. The maximum 1 year ARI wind wave conditions are shown in the top image and the 50 year ARI wind wave conditions are shown in the bottom image.

The preliminary wave modelling indicates a “Good” wave climate, i.e. wave heights less than 0.3m can be achieved for the majority of berths during 1 year storm conditions (purple). Some berths may be subjected to conditions which fulfil the “Moderate” condition criteria closer to the wavescreeen as shown (blue).

The preliminary modelling indicates conditions in a 50 year ARI storm are considered “Excellent” for the whole harbour.

Figure 3.10 Wave Modelling Results



Water Quality

Currents within the Lewis Channel adjacent to the Fisherman’s Jetty range between 0.5 and 1.5m/s, as described above in Section 3.2. Preliminary numerical modelling of the hydrodynamics indicates that the tidal currents within the marina will be less than 0.05m/s.

The low currents within the marina could result in lower levels of water quality as tidal currents alone are slow to flush clean water through the marina basin. The e-folding time (the time taken for a conservative tracer to reduce to 1/e, or 36.8% of the initial concentration) calculated for the basin is, however, still less than 30 days which is considered acceptable within other marinas around Victoria.

Conversely, the low currents can provide additional response time in the event of a pollution spill within the harbour. This additional response time could be considered beneficial given the location of the harbour within the Corner Inlet RMSAR wetland.

Flow below the wavescreen has not been included in the modelling and it is likely this will improve flushing through the marina.

Sediment Transport

To prevent the infilling of the marina basin with sand from the intertidal region to the east of Fisherman's Jetty, a rock, or geotextile sand bag breakwater is proposed. The length of the breakwater will be determined following geotechnical studies to assess the stability of the bed. Ideally, the breakwater would extend to the head of the Fisherman's Jetty to prevent infilling around the end of the structure. If geotechnical studies show the breakwater cannot extend to the T-section of the Fisherman's Jetty, a vertical wave screen may be required on the seaward end of the main Jetty to prevent wave energy entering the harbour from the east.

The construction of the breakwater adjacent to the Jetty is a common option to reduce or prevent regular maintenance dredging within the marina basin, and can be seen along the St Kilda Jetty at the Royal Melbourne Yacht Squadron.

Alternatively, a full depth wavescreen could be placed along the eastern side of the Jetty, similar to the partial depth screen on the southern side but used to block sediment movement as well as wave energy.

Detailed geotechnical studies are required to determine the most cost effective method of blocking this sediment transport and providing wave protection to the marina.

3.6 Cost Assessment

A preliminary cost assessment has been completed for construction of the Preferred Option. The unit prices of elements within the design have been derived from a number of sources, including:

- Bellingham Marina Australia
- Superior Jetties Australia
- Rawlinsons Construction Handbook
- Piling contractors
- Similar previous works completed around Victoria.

Additional technical investigations and detailed design, in particular geotechnical studies, will be required to further refine costs and design details.

Construction costs for each of the main elements outlined in the Preferred Option and are displayed in Table 3.8. Total construction costs, including contingencies, are estimates at approximately \$4.9 million (plus landside development costs as outlined in Chapter 5).

Table 3.8: Preliminary Cost Estimate

Item	Units	Cost per Unit	Total Cost
Wet berths (including piles, pontoons, and services)	1,500m ²	\$1,700	\$2,550,000
Wave attenuator	150m	\$2,000	\$300,000
Wavescreens*	100m	\$3,600	\$360,000
Breakwater*	140m	\$1,400	\$200,000
Removal of angle jetty piling	15	\$1,500	\$25,000
Dry berths			\$200,000
<i>Sub-total</i>			<i>\$3,635,000</i>
Contingency (+20%)			\$727,000
Total Construction Cost			\$4,362,000
Detailed Design Costs [†]		4% of construction cost	\$174,480
Construction and Supervision Costs		7% of construction cost	\$305,340
Total Implementation Cost			\$4,841,820

*Includes southern wavescreen only. Length of rock breakwater and need for wavescreen along the eastern side of the jetty will need to be established following geotechnical studies

[†]Costs will vary depending on the level of work required outside of Council to complete assessments required for Act approval

3.7 Implementation and Approvals

Port Welshpool is located in the Corner Inlet RAMSAR wetlands. Whilst commercial and recreational boating operations have been active at Port Welshpool for well over a century, further studies will be required to gain approval for the development of a marina.

In particular, the Federal Environmental Protection and Biodiversity Conservation (EPBC) Act requires that *“any action that has, will have, or is likely to have a significant impact on a matter of Nations Environmental Significance (NES) is required to undergo an assessment and approvals processes”*. Preliminary environmental impact studies will determine if the proposal is likely to cause a *“significant impact”*. A flowchart showing the progress to obtaining EPBC Act approval is provided in the appendices.

Likewise, to use or develop coastal Crown Land, consent under the Victorian State Government Coastal Management Act (CMA) is required. The purpose of the act is (amongst other items) *“to provide a co-ordinated approach to approvals for the use and development of coastal Crown land”*. The coastal Crown Land includes the sea bed of Victorian coastal waters.

Table 3.9 details items which are likely to be required to gain both EPBC approval and CMA consent. A number of these studies may be able to be prepared in house by Council, however others may need technical experts to assist in their preparation.

Table 3.9: Works required for EPBC and CMA approval

Primary Assessments Likely to be Required
Flora and Fauna Assessment (including Local, State and Commonwealth legislation)
Marine Ecology Assessment Transport and Parking Management Plan
Coastal Processes Report (including wave modelling and sand management plan)
Geotechnical investigation
Dredging Investigation Report
Detailed Design and Maritime Infrastructure Report
Works Methodology Report
Groundwater Protection Management Plan (especially if dredging or piling involved)
Construction Environmental Management Plan
Operations Environment Management Plan
Secondary Assessments Potentially Required
Landscape concept plans
Drainage and stormwater management plans
Servicing reports
Cultural Heritage Management Plan
Site Contamination Report (including Acid Sulphate Soils)

3.8 Summary

A preliminary assessment, which includes technical analysis, has been carried out to ascertain a preferred design and likely construction costs for the development.

- Features of the preferred design include:
 - 82 new wet berths and retention of commercial berths along Marginal Wharf and Fishermans Jetty
 - A new dry berth area with capacity for over 50 boats and mast up storage and access to the public boat ramp;
 - Provision for 10-14 temporary berths along the inside of the Fisherman's Jetty and along the landward side of the new walkway;
 - Berths along the existing angled jetty have been removed and provision for boats currently moored along this facility provided for in the new layout;
 - A wide berthing mix has been provided with a range of smaller (10m) and larger boats (up to 20m) able to be accommodated.
- Structural components of the design include:
 - A primary walkway, connected via gangway to the existing Jetty;
 - Three secondary walkways allowing access to the newly constructed berths;
 - A floating wave attenuator extending 150m from the existing Fisherman's Jetty westward to provide the bulk of wave protection to the marina;
 - A supplementary floating wave attenuator extending 10m from the angled jetty to provide additional wave protection to berths from west-southwest waves;

- A vertical wavescreen of approximately 100m length adjacent to the existing Fisherman's Jetty to provide wave protection to the marina;
- A rubble mound or sand filled geotextile breakwater running parallel to the Fisherman's Jetty to prevent infilling of the harbour by sediment.
- Total construction costs, including contingencies, are estimates at approximately \$4.9 million (plus landside development costs).
- Further detailed design of the marina, and a number of additional studies are required prior to approval being granted and construction works commence.

4 MARKET ASSESSMENT

This Chapter provides an analysis of the market for a marina at Port Welshpool with respect to supply of marina berths and facilities in other locations, and key demand drivers associated with recreational boating such as population growth and trends in boat registrations.

4.1 Supply Analysis

Thirty-eight major marinas are located across Victoria, comprising:

- Port Phillip Bay: 16 marinas
- Yarra River: 5 marinas
- Murray River and Inland Marinas: 4 marinas
- Victorian Coast: 13 marinas

Of importance to this study are marinas located along the Victorian coast, and in this regard it is noted that most marinas are clustered in the Lakes Entrance area of East Gippsland (eg Metung and Paynesville), approximately 210km (or a 150-minute drive) east of Port Welshpool, with the remaining coastal marinas located on or near Phillip Island (eg New Haven, San Remo) approximately 110km (or a 90-minute drive) west of Port Welshpool.

Importantly, no major coastal marinas are located between Phillip Island and Lakes Entrance, making Port Welshpool an important strategic location in terms of providing a facility to support a large recreational boating area which includes large populations in south-east Melbourne and the Latrobe Valley.

The location of major marinas in Victoria and primary and secondary marinas along Victoria's coast are mapped in Figures 4.1 and 4.2.

A number of small marinas/ports are located on the coast in proximity to Port Welshpool and these include:

Port Albert – includes an all-weather boat launching ramp, several sheltered jetties and a small number of private moorings, fuel and boat hire. Port Albert is located approximately 35km (a 25-minute drive) east of Port Welshpool.

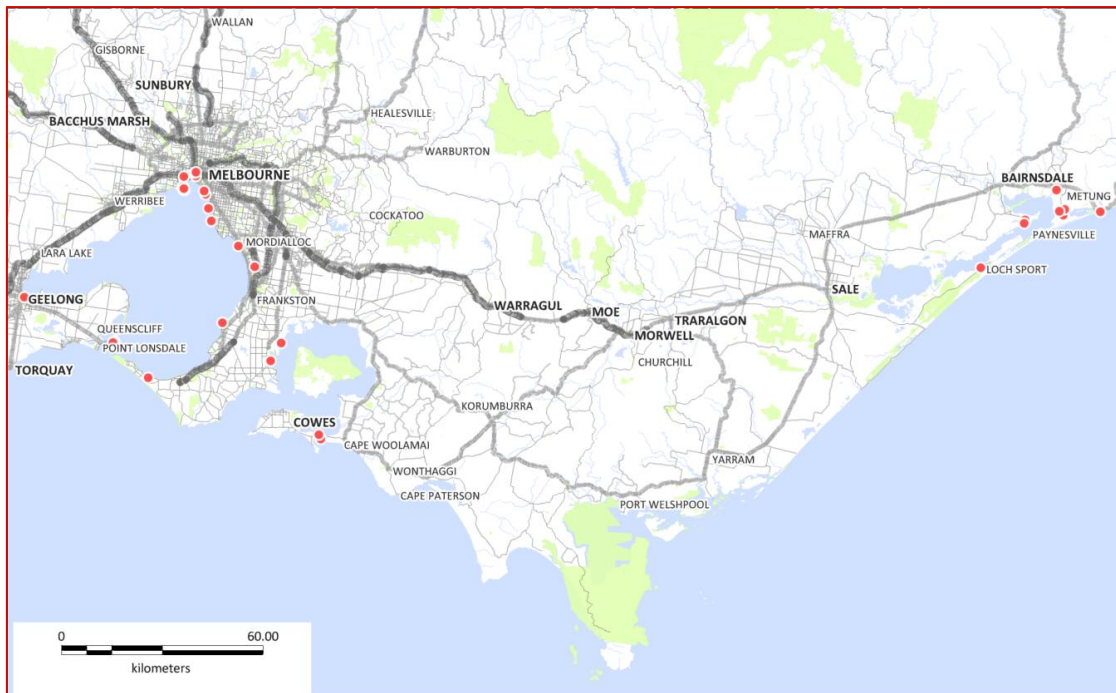
Port Franklin – provides moorings for professional fishing boats, commercial charter vessels and some private vessels. Port Franklin is located approximately 25km (a 25-minute drive) west of Port Welshpool.

Table 4.1: Major Marinas Located in Victoria

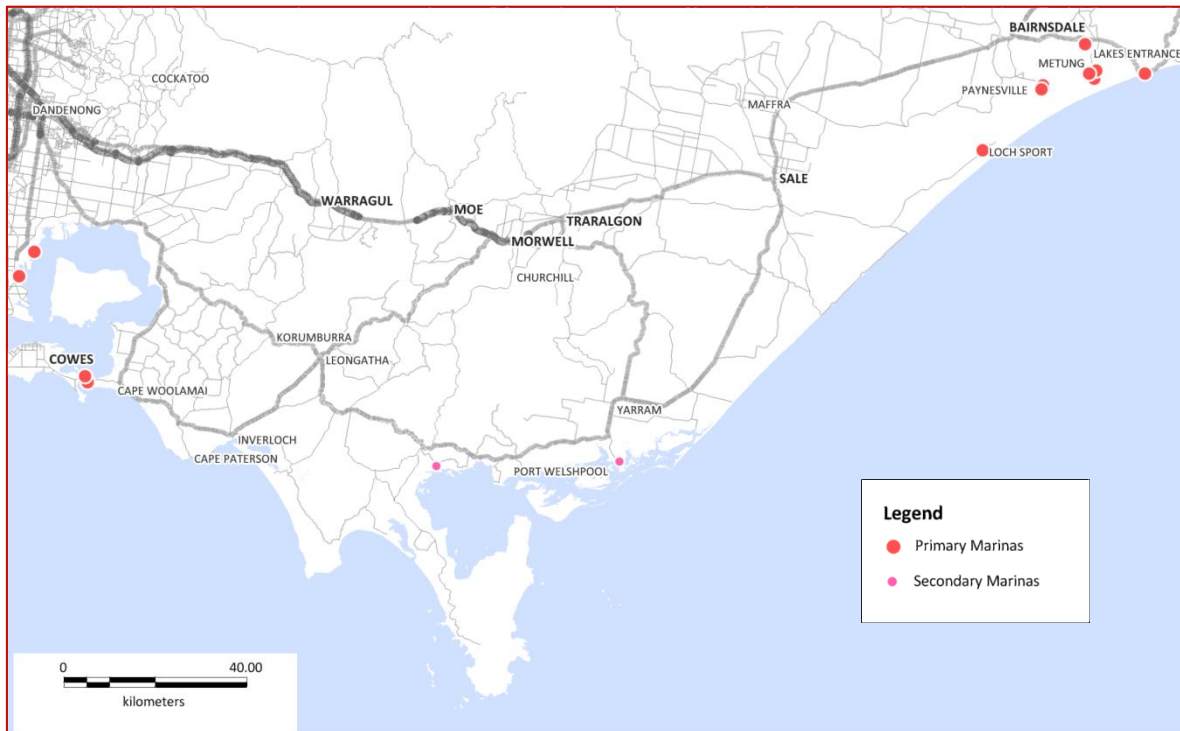
Port Phillip Bay	Yarra River	Murray River and Inland Marina	Victorian Coast
Anchorage Marina	d’Albora Victoria Harbour	Lake Eildon Marina	Loch Sport Marina
Blairstown Yacht Squadron	d’Albora Pier 35	Murray Downs Marina, Swan Hill	Metung Chinamans Creek
Queenscliff Harbour	Marina Yarras Edge	Wahgunyah Marina	Slip Bight Marina, Paynesville
Royal Brighton Yacht Club	Melbourne City Marina	Dockside Mildura Marina	Lakes Entrance Marina
Royal Geelong Yacht Club	New Quay Marina		Western Port Marina, Hastings
Royal Melbourne Yacht Club			Yaringa Marina, Somerville
Royal Victorian Motor Yacht Club			Newhaven Yacht Squadron, Phillip Island
Royal Yacht Club of Victoria			San Remo Harbour
Savages Wharf			Gippsland Lakes Yacht Club, Paynesville
St Kilda Marina			Mariners Cove, Paynesville
Hobsons Bay Yacht Club			5 Knots Marina, Metung
Mordialloc Motor Yacht Club			Berths @ Beaches Kings Cove, Metung
Mornington Yacht Club			Tambo Marine
Queenscliff Cruising Yacht Club			
Sandringham Yacht Club			
Patterson Lakes Marina			

Source: <http://www.maps.redlid.com.au/marinas/map-vic.htm>

Figure 4.1: Major Marinas Located In Victoria



Source: Produced by Essential Economics using MapInfo

Figure 4.2: Primary and Secondary Marinas Located along Victoria's Coast

Source: Produced by Essential Economics using MapInfo

4.2 Proposed Marina Developments

A number of major coastal marina projects are currently proposed which are at various stages of planning. A brief summary of key proposals is provided as follows.

Yaringa Boat Harbour Expansion

A \$50 million marina development is proposed which will expand the number of berths from 600 to 1,000. The development is currently being assessed under the Federal Government's Environment Protection and Biodiversity Conservation Act, prior to final approval by the State Government.

Bancroft Bay Marina, Metung

The Bancroft Bay Marina Redevelopment Project is a \$10 million project, involving demolition of the existing marina and construction of a new marina. Phase 1 of this project involves the removal of marina and construction of 206 berths (144 exclusive-use berths, 17 public berths, and 45 public moorings) and supporting infrastructure. The redeveloped marina will provide slightly more berths than the previous marina (185 berths). Phase 2 of the development will involve land and foreshore improvements.

It is expected the development will be funded jointly by East Gippsland Shire Council and the Federal Government, with a funding application currently being considered as part of the RDAF funding round.

Mornington Safe Harbour Development

The \$20 million proposal involves the development of a safe harbour at Mornington, including a full length wavescreen, new jetty and provision of 200 berths/moorings (a significant increase from the current provision of 90 berths/moorings). The proposal was subject to an Environment Effects Statement (EES) and subsequent Inquiry (in 2011). The Inquiry concluded that the environmental effects of the project are manageable and that the Mornington Safe Harbour proposal has strong policy support and should proceed.

However, a Planning Scheme Amendment required to facilitate the development was abandoned by Mornington Peninsula Shire Council (February 2012), with Council resolving to commence a new process for the future policy and planning with regard to development for Mornington Harbour. The future of the development of Mornington Marina is therefore unclear at present, but unlikely to include a development of the scale originally proposed.

4.3 Demand Analysis

Population Trends

Strong population growth is projected for the Regional Study Area over the coming 20 years, with population levels increasing from approximately 260,000 persons in 2011 to 346,000 persons in 2031. This represents an expansion in the regional population of 86,000 persons and an annual average growth rate of 1.5%, which is slightly higher than projected growth rates for the Melbourne Statistical District (1.4%) and Victoria (1.4%).

Based on the existing ratio of 15 persons for every registered boat in Gippsland, projected population growth could stimulate demand for a further 5,700 boats in Gippsland over the coming years (or approximately 285 new boat registration per year on average). This is on top of existing boat registrations which are assumed to be ongoing.

Population projections are shown in Table 4.2.

Table 4.2: Population Projections, Selected Areas 2011-31

	2011	2016	2021	2026	2031	Change 2011-31	AAGR 2011-31
Bass Coast (S)	30,020	35,760	40,040	45,190	49,950	+19,920	2.6%
Baw Baw (S)	43,420	49,170	54,440	59,580	64,610	+21,190	2.0%
East Gippsland (S)	42,790	47,580	51,150	54,960	58,810	+16,020	1.6%
Latrobe (C)	73,560	79,890	83,530	87,140	90,740	+17,180	1.1%
South Gippsland (S)	27,510	29,120	30,190	31,350	32,510	+5,000	0.8%
Wellington (S)	41,950	44,740	46,010	47,470	49,280	+7,330	0.8%
Study Region Total	259,250	286,270	305,360	325,700	345,890	+86,640	1.5%
Melbourne Statistical District	4,107,950	4,483,600	4,808,840	5,118,450	5,411,940	+1,303,990	1.4%
Victoria	5,534,530	6,067,700	6,500,650	6,924,140	7,326,560	+1,792,040	1.4%

Source: ABS 3218.0 Regional Population Growths, Australia 2012; DPCD Victoria in Future 2012

Note: AAGR – average annual growth rate

State Boating Trends

Significant growth in recreational boating has occurred over recent years, with boating registrations increasing from 146,990 registrations in 2003 to 170,450 registrations in 2012 (growth of 11.6% over the period). This data is sourced from *Gippsland Vessel Registration Analysis – 2012 Addendum* (Tibar Services, 2013)

No recent State data is available for trends in vessel sizes; however, data for the period 2005-09 sourced from the Gippsland Boating Action Plan shows an uplift in registrations across all boat sizes over this period. The greatest increase in boat registrations was in the medium (5.6 to 7.0 metres) and large (7.1 to 8.6 metres and over) categories which have grown at 29.1% and 19.0% respectively. Registration of small boats also increased, albeit at a much lower rate of 8.7% over the period.

While these trends highlight a shift towards medium to large size boats, it is important to recognise that small boat registrations continue to represent 83% of all registrations (down from 85% in 2005), with the medium and large boating categories responsible for 17% of registration in 2009 compared to 15% in 2005.

When considering the capacity and design of Port Welshpool Marina, these trends will need to be factored in. Regional boat registration trends are discussed below.

Recreational boat registration data is shown in Table 4.3.

Table 4.3: Recreational Boating Registration Trends, Victoria 2005-2009

Boat Category	Length	Boat Registration 2005	Share of Total	Boat Registration 2009	Share of Total	Change (No.)	Change (percent)
Small	Less than 4.0m	64,540	42.0%	70,140	41.0%	+5,600	+8.7%
Small	4.1-4.5m	26,950	17.5%	28,110	16.4%	+1,160	+4.3%
Small	4.6-5.5m	39,090	25.4%	43,740	25.5%	+4,650	+11.9%
Sub-Total – Small		130,580	84.9%	141,990	82.9%	+11,410	+8.7%
Medium	5.6-6.5m	14,230	9.3%	18,390	10.7%	+4,160	+29.2%
Medium	6.6-7.0m	2,080	1.4%	2,660	1.6%	+580	+28.1%
Sub-Total – Medium		16,310	10.6%	21,050	12.3%	+4,740	+29.1%
Large	7.1-8.5m	3,160	2.1%	3,790	2.2%	+630	+20.1%
Large	8.6m and over	3,740	2.4%	4,420	2.6%	+680	+18.1%
Sub-Total – Large		6,900	4.5%	8,210	4.8%	+1,310	+19.0%
Total		153,790	100.0%	171,250	100.0%	+17,460	+11.4%

Source: Draft Gippsland Coastal Boating Action Plan 2012

Regional Boating Trends

Vessel registrations data and other boating trends have been prepared by Tibar Services on behalf of Gippsland Ports.

This data shows boat registrations for the Gippsland Catchment increased from 14,790 in 2003 to 18,420 in 2012, representing 25% growth over the period, which is more than twice the rate observed across Victoria for the same period.

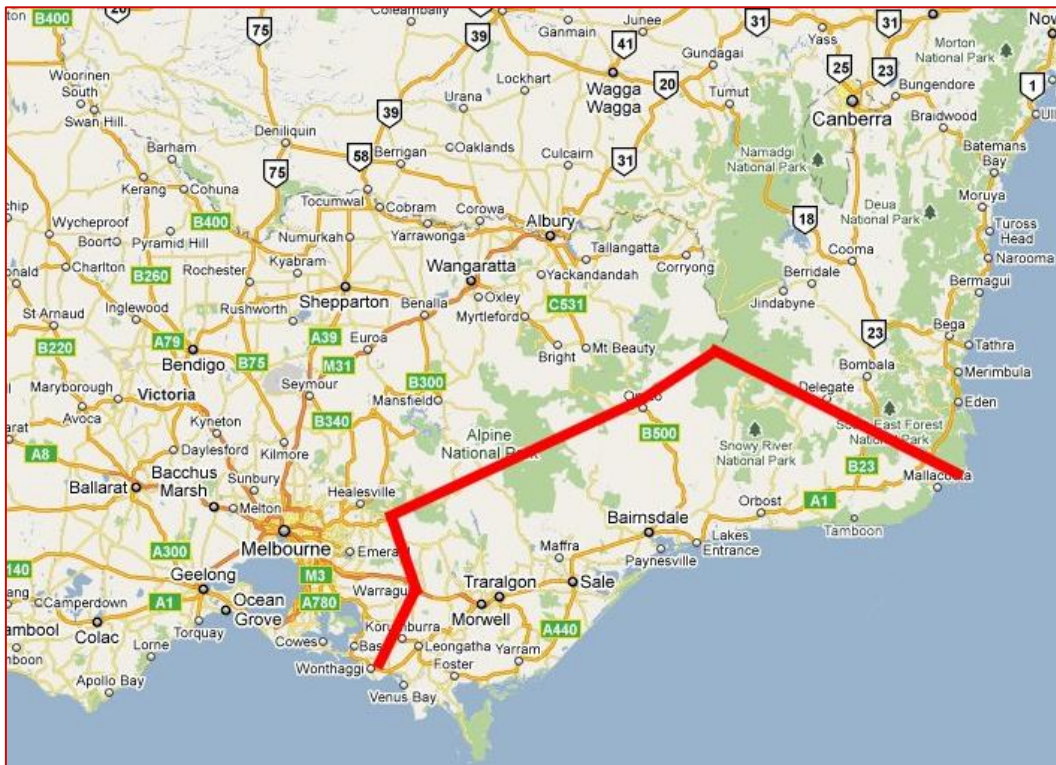
When boat registration by vessel size is considered, in 2012 approximately 78% of vessels were small (under 5.5 metres), 14% were medium (5.6 metres to 7.0 metres) and 8% were large (over 7.1 metres). Compared to State averages (see Table 4.1 – boat registrations for 2009), Gippsland has a slightly lower proportion of smaller vessels (78% cf 82%), but a higher proportion of large vessels (8% cf 5%).

A significant proportion of Gippsland’s registered boats are open or ½ cabin or cabin cruisers (91%), with 5% of vessels classified as personal water craft, and 4% registered as sailing boats and yachts.

A total of 56% of sailing boats / yachts are above 7.1m in size, and 64% of cabin cruisers also fall into the large vessel category. Open vessels are mainly small in size (92%) and ½ cabin vessels are a mix of small (67%) and medium (28%) sizes.

The Gippsland Catchment area is shown in Figure 4.3 and boat registration data is included in Tables 4.4 and 4.5.

Figure 4.3: Gippsland Boat Registration Catchment



Source: Recreational and Commercial Vessel Data – The Gippsland Picture; Tibar Services 2010

Table 4.4: Gippsland Boat Registrations, 2003 to 2012

	2003	2004	2005	2006	2007	2008	2009	2010	2012	Change 2003-12	Growth 2003-12
Registered Boats	14,790	15,340	15,930	16,440	16,960	17,630	18,240	17,930	18,420	+3,360	+24.5%

Source: Recreational and Commercial Vessel Data – The Gippsland Picture; Tibar Services 2010 and 2013

Note: Figures rounded

Table 4.5: Gippsland Boat Registrations by Vessel Size and Type, 2012

Vessel Type											Total	Share
Length (m)	Open	½ Cabin	Cabin Cruiser	Air Cushion	Trailer Sailer	Yacht	PWC	Canoe	House Boat			
0.0 - 4.0	5,163	39	5	65	4	4	969	9	0		6,258	34.0%
4.1 - 4.5	2,554	552	12	1	5	2	7	1	1		3,135	17.0%
4.6 - 5.5	2,734	2,126	101	4	81	11	5	2	0		5,064	27.5%
5.6 - 6.5	730	981	229	1	86	18	2	0	0		2,047	11.1%
6.6 - 7.0	73	168	103	0	69	20	0	0	1		434	2.4%
7.1 - 8.5	76	135	272	0	129	82	0	0	2		696	3.8%
>8.5	25	45	535	0	17	152	0	0	8		782	4.2%
Total	11,355	4,046	1,257	71	391	289	983	12	12		18,416	100.0%
	61.7%	22.0%	6.8%	0.4%	2.1%	1.6%	5.3%	0.1%	0.1%			

Source: Recreational and Commercial Vessel Data – The Gippsland Picture; Tibar Services 2010 and 2013

Note: Figures rounded

This data also shows that for the Cornet Inlet Catchment, which is considered to be within a 2-hour drive, registrations increased from 9,450 registrations in 2003 to 11,550 registrations in 2012, representing 22% growth over the period, which is approximately double the rate experienced across Victoria for the same period.

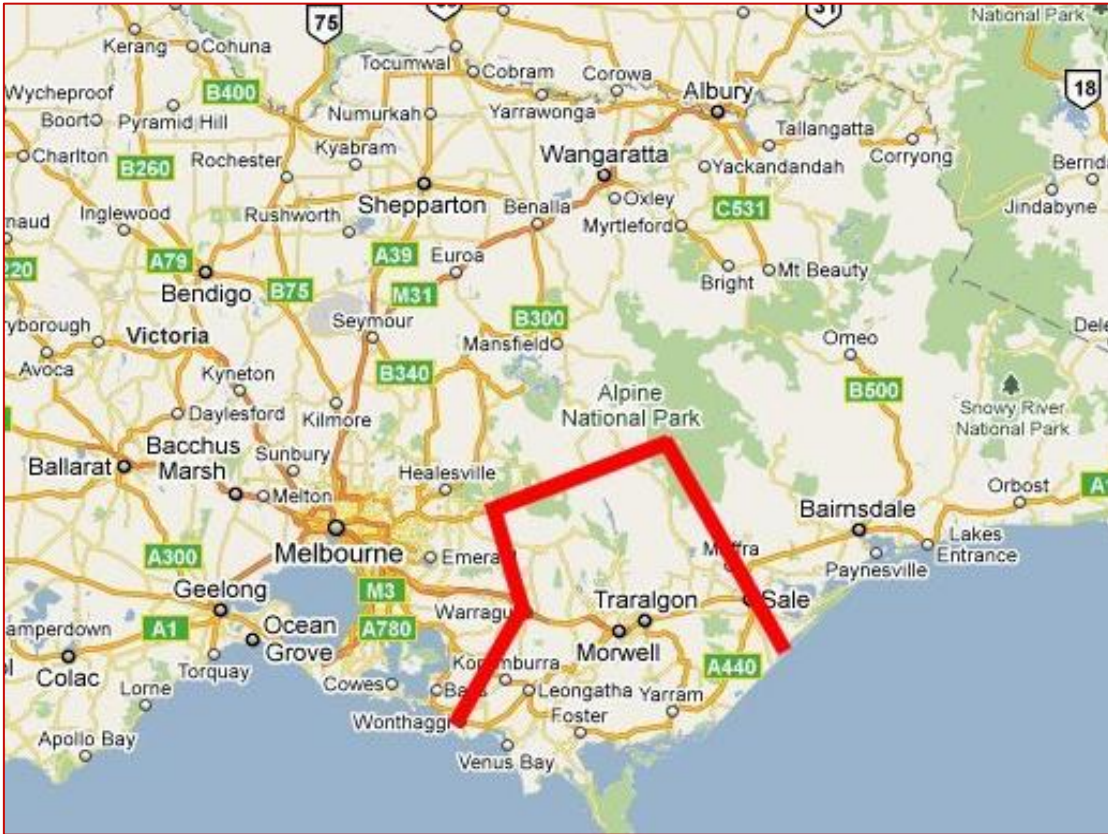
When boat registration by vessel size is considered, in 2012 approximately 81% of vessels were small (under 5.5 metres), 14% were medium (5.6 metres to 7.0 metres) and 5% were large (over 7.1 metres). These proportions are the same as State averages.

A significant proportion of Corner Inlet's registered boats are open or ½ cabin or cabin cruisers (85%), with 7% of vessels classified as personal water craft, and 2% registered as sailing boats and yachts.

A total of 47% of sailing boats / yachts are above 7.1m in size, and 54% of cabin cruisers also fall into the large vessel category. Open vessels are mainly small in size (93%) and ½ cabin vessels are a mix of small (67%) and medium (29%) sizes.

The Corner Inlet catchment area is shown in Figure 4.4 and boat registration data is included in Tables 4.6 and 4.7.

Figure 4.4: Corner Inlet Boat Registration Catchment



Source: Recreational and Commercial Vessel Data – The Gippsland Picture; Tibar Services 2010

Table 4.6: Cornet Inlet Boat Registrations, 2003 to 2012

	2003	2004	2005	2006	2007	2008	2009	2010	2012	Change 2003-12	Growth 2003-12
Registered Boats	9,450	9,670	10,000	10,310	10,670	11,100	11,480	11,240	11,550	+2,100	+22.2%

Source: Recreational and Commercial Vessel Data – The Gippsland Picture; Tibar Services 2010 and 2013

Note: Figures rounded

Table 4.7: Cornet Inlet Boat Registrations by Vessel Type, 2012

Vessel Type												
Length (m)	Open	1/2 Cabin	Cabin Cruiser	Air Cushion	Trailer Sailer	Yacht	PWC	Canoe	House Boat	Total	Share	
0.0 - 4.0	3,241	29	2	35	1	1	778	3	-	4,090	35.4%	
4.1 - 4.5	1,668	390	10	1	3	2	3	-	1	2,078	18.0%	
4.6 - 5.5	1,690	1,427	66	2	43	3	5	2	-	3,238	28.0%	
5.6 - 6.5	441	688	128	-	45	6	1	-	-	1,309	11.3%	
6.6 - 7.0	40	120	57	-	35	4	-	-	-	256	2.2%	
7.1 - 8.5	29	82	110	-	51	20	-	-	1	293	2.5%	
>8.5	9	16	199	-	2	52	-	-	4	282	2.4%	
Total	7,118	2,752	572	38	180	88	787	5	6	11,546	100.0%	
	61.6%	23.8%	5.0%	0.3%	1.6%	0.8%	6.8%	0.0%	0.1%			

Source: Recreational and Commercial Vessel Data – The Gippsland Picture; Tibar Services 2010 and 2013

Corner Inlet – Larger Vessel Analysis (8.5m+)

A detailed review of the 278 larger vessels (8.5m+) registered in Corner Inlet in 2012 (excludes houseboats), shows the following:

- Spilt of approximately 80% power boats (226 vessels) and (20%) yachts (52 vessels)
- Average power boat size of 11.7m (ranging from 8.6m to 47.7m) split as follows:
 - 74 vessels of 8.6m to 9.9m in size (33% of registered power boats),
 - 85 vessels 10.0m to 11.9m in size (38% of registered power boats),
 - 40 vessels 12.0m to 14.9m in size (18% of registered power boats)
 - 15 vessels 15.0m to 17.9m in size (7% of registered power boats)
 - 5 vessels 18.0m to 19.9m in size (2% of registered power boats)
 - 7 vessels above 20m in size (3% of registered power boats)
- Average Yacht size of 10.6m, (ranging from 8.6m to 15.2m) split as follows:
 - 20 vessels of 8.6m to 9.9m in size (38% of registered yachts),
 - 21 vessels 10.0m to 11.9m in size (40% of registered yachts),
 - 9 vessels 12.0m to 14.9m in size (17% of registered yachts)
 - 2 vessels above 15.0m in size (4% of registered yachts)

4.4 Price Point Analysis

A review of current berth price data across Victoria shows an average annual fee of approximately \$5,600 for 12m vessels.

As Table 4.8 shows, prices range from \$925 pa for the existing undeveloped Metung Marina to \$10,000+pa for metropolitan Melbourne facilities such as Williamstown and Yarra's Edge.

Table 4.8: Comparison of Annual Berth Costs for 12m Vessels, Selected Victorian Locations

Location	Average Annual Berth Fee
The Anchorage Marina, Williamstown	\$10,750
Marina YE, Yarra's Edge	\$10,400
Savages Wharf, Williamstown	\$10,080
Blairstown Yacht Squadron (Safe Harbour)	\$7,330
Westernport Boat Harbour, Yaringa Marina	\$5,330
Western Port Marina, Hastings	\$4,930
Slip Bight Marina, Paynesville	\$2,810
Raymond Island, Paynesville	\$1,930
Lakes Entrance Marina	\$1,240
Metung Marina (undeveloped)	\$925
Average Fee	\$5,600

Source: East Gippsland Shire Council

Note: Figures rounded

For new or high quality regional coastal marinas, price points tend to average \$3,500 pa to \$6,000 pa, depending on berth size and leasing term.

For example, the recently-completed Paynesville Slip Bight Marina (which is owned and operated by Council) is currently leasing 15-year berths from between \$3,390pa for a 10m berth to \$5,980pa for an 18m berth, as shown in Table 4.9.

Table 4.9: Slip Bight Marina – Jetty 5, Lease Fees

Tenure	10-Year Permit	15-Year Permit	20-Year Permit
Berth Size	Upfront cost (inc GST)	Upfront cost (inc GST)	Upfront cost (inc GST)
10m	\$36,300	\$50,800	\$64,900
12m	\$41,900	\$58,700	\$75,200
12m multi-hull	\$58,000	\$81,200	\$104,000
14m	\$48,800	\$68,600	\$87,800
14m multi-hull	\$69,500	\$97,600	\$125,100
16m	\$57,300	\$80,000	\$103,300
18m	\$63,700	\$89,700	\$113,800

Source: <http://slipbightmarina.com.au/jetty-5>

4.5 Conclusions

The main findings of this market assessment are as follows:

1. While nearly 40 major marinas are located in Victoria, relatively few are located along the State's coast. Most of these coastal marinas are concentrated in the Lakes Entrance area, especially Paynesville and Metung, and in or around Phillip Island.

2. Importantly, no major coastal marinas are located between Phillip Island and Lakes Entrance (although some small facilities are provided, such as at Port Albert). This situation makes Port Welshpool an important strategic location for a new marina, recognising the strong population base in this general region spanning south-east Melbourne to the Latrobe Valley.
3. A number of marina developments are proposed in Westernport and Gippsland which may increase the supply of berths along this part of the coast. However, developments such as those proposed at Yaringa and Bancroft Bay are currently subject to planning and funding requirements prior to approval.
4. Boat registrations in Victoria have increased steadily over recent years, indicating ongoing growth in demand for recreational boating. For example, over the period 2003 to 2012 boat registrations increased from 147,000 to 170,000 boats, or 11% growth over the period.
5. Demand has been particularly strong in the Gippsland region where boat registrations have increased by approximately 25% (representing an additional 3,360 boats) between 2003 and 2012. A similar strong trend has been observed for the Corner Inlet area over this period, with boat registrations increasing by 22% (representing an additional 2,100 boats). These boat registration growth rates are approximately twice the rate experience across the State, highlighting the ongoing strength of the Gippsland and Corner Inlet recreational boating markets.
6. This analysis clearly shows strong demand exists for boating facilities in the general area which Port Welshpool will service; this strong demand is especially evident when population growth is taken into account, indicating an additional 5,700 boats will be registered in Gippsland over the coming 20 years.
7. Boat registration data for larger vessels (8.5m+) registered in Corner Inlet shows a 80/20 split between powered boats and yachts comprising a broad mix of sizes between 8.6m and 20m. These characteristics are of importance with regard to the optimal design and layout of the marina.
8. Price points for berths are dependent on location and quality of the facility. Generally, berths at coastal marinas are significantly cheaper than for metropolitan marinas and this should be considered as a positive demand factor for Port Welshpool. However, berth prices will need to be determined against the development's capital investment and funding model, and with regard to prices at competitor facilities in Westernport and Lakes Entrance.

5 ECONOMIC IMPACT ASSESSMENT

This Chapter provides an Economic Impact Assessment of Port Welshpool Marina development with reference to the recommended concept. The assessment includes estimates for project investment, employment (construction and ongoing), business participation, Marina revenue generation, visitation and visitor spending. Return on Investment and Benefit Cost Analysis are also provided for three demand scenarios.

Construction

Marina

The construction phase of the marina redevelopment will involve total investment of approximately \$4.9 million (as outlined in Chapter 3).

Landside facilities

Provision for small-scale commercial operations should be made at an early stage to support recreational fishing and visitor needs, and to increase the overall attractiveness of the marina. While these facilities might initially be modest reflecting potential demand levels, there is currently a lack of visitor facilities available in Port Welshpool and the introduction of commercial activity on the foreshore would be a welcome addition for the township.

In our view landside facilities should comprise the following:

- Small café/takeaway facility
- Small shop (bait, fishing equipment, boat supplies, souvenirs)

Note, these facilities could be combined into a single operation. The most practical delivery mechanism would be through the partial use (say, 200m²) of the existing Port Welshpool Terminal Building, which is shown in Figure 5.1, which is currently underutilised.

Some refurbishment would be required to configure the building for commercial uses; however, the sound physical structure of the building, availability of public amenities and the ability to provide exceptional views for visitors makes this an attractive and cost-effective option compared to constructing a new building(s).

Figure 5.1: Port Welshpool Terminal Building

Additional landside facilities to support the Marina include:

- Car parking for 50 vehicles including buses and trailers (at grade)
- Civil works and landscaping
- Security

A Masterplan is required to identify the most appropriate location for these facilities in terms of maximising views, ensuring good visitor exposure, providing safe and accessible pedestrian and traffic movement etc.

The costs of these landside facilities are estimated at \$570,000 (rounded) and are detailed in Table 5.1.

Table 5.1: Port Welshpool Marina Development – Landside Facilities Costs

Item	Quantity	Cost per Unit	Total Cost
Refurbishment of Existing Terminal Building	200m ²	250m ²	\$50,000
Car parking ²	50 parks	\$3,000 per space (1,250m ²)	\$150,000
Civil works ³ (roads, footpaths, paved areas, landscaping)	Allow for 1,500m ²	\$125m ²	\$187,500
Security (fencing, CCTV cameras)	-	-	\$70,000
<i>Sub-total</i>			<i>\$457,500</i>
Design costs (5%)			\$22,875
Contingency (20%)			\$91,500
Total			\$571,875 or \$570,000 rounded

Source: ¹ Rawlingsons Construction Handbook 2011 – includes preliminaries, substructure, superstructure, finishes, services, external services and contingency – but NOT fit out;
² Rawlingsons Construction Handbook 2011 – assumes average of 25m² per car park and includes bitumen paving, stormwater drainage, minimal lighting and some landscaping
³ Rawlingsons Construction Handbook 2011 – general landscaping around buildings including planting of shrubs

Total Investment

In total, approximately \$5.4 million would be required to develop a new 82 berth marina, itinerant berths and small-scale associated landside facilities.

A significant proportion of this investment will benefit Gippsland businesses (including those located in South Gippsland Shire), including firms involved in project management, project design, demolition and construction, manufacture of marina structures, provision of utility services etc.

Ongoing

Once the marina redevelopment is completed, ongoing investment will be required in the operation and maintenance of the facility. Based on estimates for similar marina developments approximately \$100,000 pa would be required to ensure the facility is well maintained and operates effectively (or up to \$3.0 million over a 30-year lifecycle of the marina in constant 2013 dollars or \$1.3 million in NPV). The annual operational and maintained fee applied to berth lease holders will offset some of these costs.

The operation and maintenance requirements of the marina will support a small number of permanent jobs in the regional economy (as noted below).

Future Investment

The successful completion of Stage 1 of the development, as outlined in this report has the potential to leverage further investment as the marina and supporting landside facilities expand. For example, future commercial activities might include a restaurant, boat maintenance, speciality shops etc.

5.2 Construction Employment

Taking the investment amount of \$5.4 million and allowing for a 50/50 split between labour and capital costs, a total of \$2.7 million can be allocated to wages and salaries associated with construction investment.

Direct construction employment for Stage 1 of the marina redevelopment is estimated at 30 equivalent full-time (EFT) jobs (rounded) and this includes employment associated with labour, machinery operation, transport and logistics, electrical installation, engineering, project management and so on. This estimate is based on an average annual full time wage of approximately \$85,000 for the construction sector (including on-costs) and is derived from ABS Average Weekly Earnings 6302.0, November 2013.

A further 50 EFT jobs (rounded) would be supported indirectly in the wider economy through the multiplier effect (based of multiplier of 2.6 included in ABS Input-Output tables for category "other construction"), with some of this employment likely to be sourced from within the region.

In total, an estimated 80 EFT jobs would be supported through the direct and indirect construction activities associated with the marina redevelopment.

5.3 Business Participation

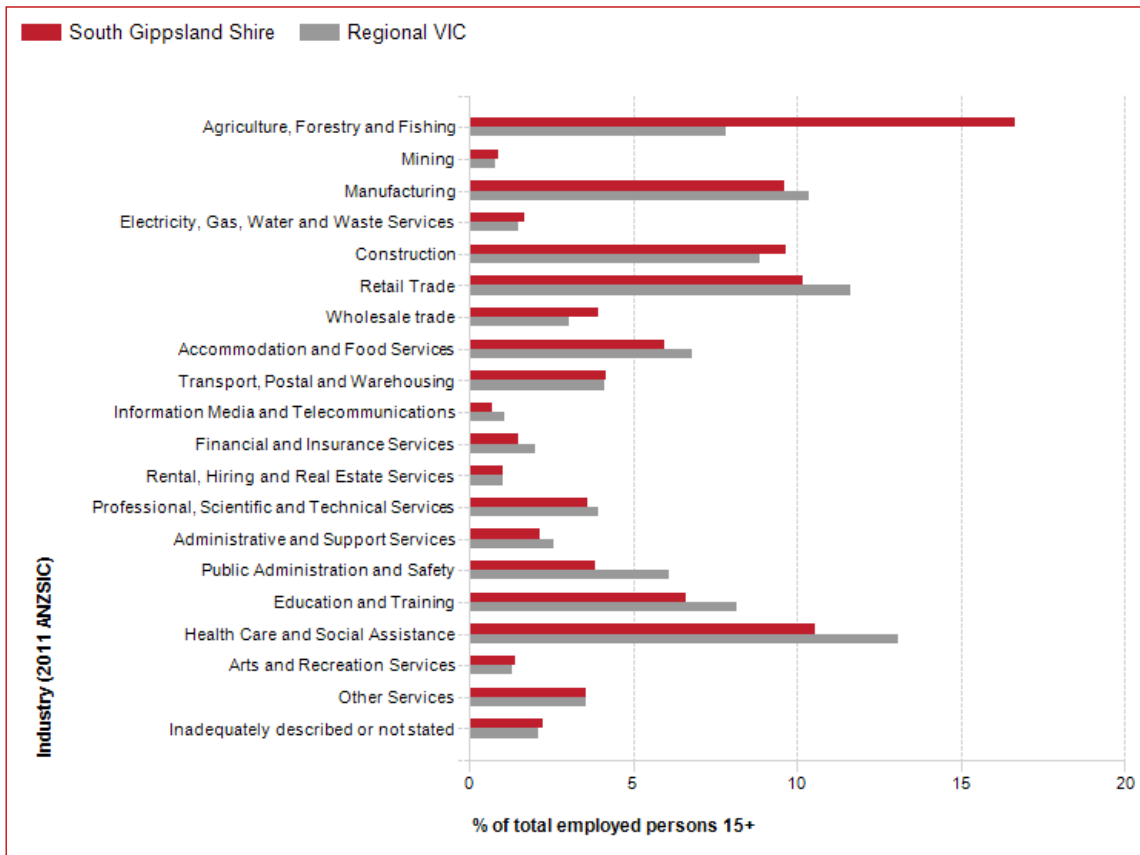
Construction of Port Welshpool Marina and associated landside facilities represents a major project for South Gippsland, and as noted, will support many jobs during the construction phase creating new opportunities for local workers and businesses.

As Figure 5.2 shows, South Gippsland has a relatively high proportion of residents employed in the construction sector (9.7%) compared to regional Victoria (8.9%), with 1,210 resident workers out of a workforce of 12,490 employed in the sector in 2011.

In 2011, 4,360 of South Gippsland's resident workers or 35% of the workforce were employed in construction-related occupations such as technicians and trades, machinery operators and drivers and labourers; this figure is marginally above the 34% for regional Victoria. Occupational data is shown in Figure 5.3.

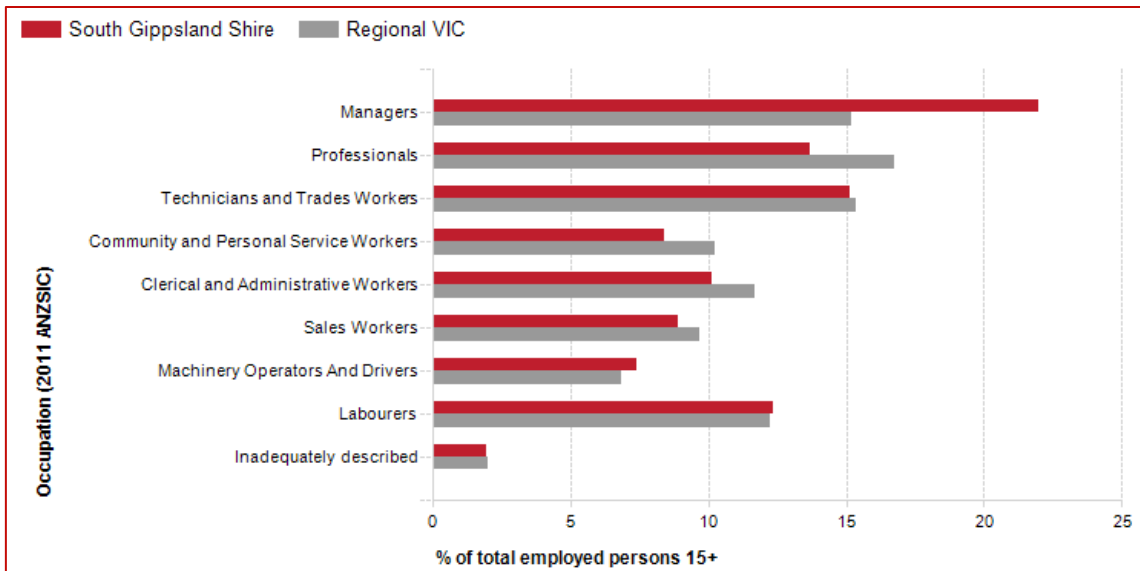
South Gippsland's business structure emphasises opportunities that may emerge from the marina project, with approximately 16% of businesses located in the Shire (or 610 business out of a total of 3,800 businesses) associated with construction and transport services (ABS Counts Of Australian Businesses, June 2009).

Figure 5.2: Employment by Industry Sector, South Gippsland Shire 2011



Source: Community id

Figure 5.3: Occupational Structure, South Gippsland Shire 2011



Source: Community id

5.4 Revenue Assessment

Wet berth sales

Wet berths sales will provide a key funding stream for the project, although the sales revenue will be recouped over the longer-term to pay for upfront capital investment. Based on the analysis included in this report (refer to Section 4.4) a realistic average annual leasing price for new marina berths in this location would be approximately \$5,000 pa (with a 10-year lease permit). These price points would vary from, say, \$3,500 pa for a 12m vessel to \$6,000 pa for an 18m vessel.

Over a 30-year lifecycle, these 82 berths fully occupied could return net revenue of \$4.8 million in Net Present Value (NPV) terms.

Dry Berth Leases

Recognising any dry berth facilities provided would be initially very basic, the expected lease returns could be in the order of \$25 per week or approximately \$1,300 per berth pa. A 50-berth dry storage facility would therefore have the potential to generate \$65,000 pa or \$0.8 million over 30 years in NPV terms.

In total, wet berth sales and dry berth leases have the potential to generate \$5.6 million (in NPV terms) over 30 years. Note, this assumes full occupancy of the berths over this lifecycle.

Itinerant (Visitor) Wet Berth Leases

The 10 itinerant (visitor) wet berths could be expected to generate \$40 per night based on comparable benchmarks in the Gippsland region. Over a 30-year period, these berths have the potential to generate \$1.8 million in Net Present Value terms, if fully occupied.

Operational and Maintenance Fees

Approximately \$580,000 (NPV) would be generated through annual operational and maintenance fees over 30-years if all wet and dry berths were leased.

Retail Leases

200m² of commercial floorspace would generate approximately \$25,000 pa (based on a ratio of \$125/m²). This would provide revenue of \$315,000 (NPV) over 30 years, assuming the floorspace is fully occupied.

No Council rates would be payable as it is assumed the commercial operations would be delivered from the Council-owned Port Welshpool Terminal Building.

Summary

Approximately \$8.4 million (NPV) in revenue could be generated from the marina facility and associated facilities over the 30-year lifecycle of the project. This is based on 100% berth and floorspace occupancy and compares to capital and ongoing costs over the 30-year period of \$7.2 million, as shown in Table 5.2.

5.5 Ongoing Employment

Ongoing employment directly associated with the operation and maintenance of the marina is estimated at 7 Full Time Equivalent (FTE) jobs and this includes employment associated with dry boat storage operation (1 FTE), café/shop (4 FTEs), maintenance contractors (1 FTE) and operational responsibilities at Council (1 EFT). Some of these jobs would be part-time/casual (café/shop), so the actual number of persons employed would be higher.

A further 17.5 EFT jobs would be supported indirectly in the wider economy through the multiplier effect (based of multiplier of 3.5 included in ABS Input-Output tables for category "water transport"), with some of these positions likely to be sourced from within the region.

In total, an estimated 24.5 EFT jobs would be supported through the direct and indirect operational activities of the redeveloped marinas.

5.6 Visitation Impacts

According to data included in the Business Case for the Restoration of the Port Welshpool Long Jetty (AEC Group, 2010), in 2010 Port Welshpool attracted approximately 42,000 day trip visitors and 19,000 overnight visitors.

According to Tourism Victoria data relating to visitor expenditure in the Gippsland Region (December 2013), the average spend per overnight visitor to was \$110 per night (rounded). In 2013, daytrip visitor expenditure in the Gippsland Region was estimated to be \$90 per trip (rounded).

Assuming each of the new private berths (68 berths, excluding the 14 which will accommodate existing users) will be occupied for an average of approximately 40 days annually ie one weekend visit per month (2 days) and a further two weeks for holiday period (14 days) per year – then 2,720 visitor days pa would be generated from the marina development. If 2 persons per trip are assumed, then total visitation would involve approximately 5,440 persons annually. This level of overnight visitation would (potentially) yield spending of approximately \$600,000 pa (rounded) based on an average spending of \$110 per person per night. If the 10 visitor berths were 50% occupied this could yield an additional 1,825 visitors (assuming one visitor per vessel), generating a further \$200,000 for the economy (based on \$110 per night spend).

Additionally, day trip visitation to Port Welshpool would be expected to increase due to the marina development and associated Corner Inlet tourism projects (especially the Port Welshpool Long Jetty Restoration and the Great Southern Rail Trail Extension). Assuming a 1:1 ratio of day trip to overnight visitors to Port Welshpool an estimated 7,265 additional day trip visitors will be attracted to Port Welshpool annually due to the marina development. This level of day visitation would (potentially) yield spending of \$650,000 pa (rounded) based on an average spending of \$90 per person per day.

In total, approximately \$1,450,000 pa in additional visitor spending could be generated through the development of Port Welshpool marina. The amount of expenditure retained in Port Welshpool/Welshpool will be dependent on the tourism 'offer' available and in this regard it is noted that currently there are limited visitor facilities (accommodation, cafes, restaurants, pubs, gift shops etc) in these townships. However, established business such as the Long Jetty Caravan Park, The Pier Port Hotel (Port Welshpool), Welshpool Hotel/Motel etc

would be expected to benefit from additional visitor spending while the proposed new landside café and shop would also be supported by this new spending. Spending not directed to Port Welshpool and Welshpool is likely to benefit other tourism-related businesses in the Corner Inlet, especially in larger townships such as Foster.

5.7 Spending Impacts

New visitor spending will support a number 10 EFT jobs in the local economy (assuming 1 job is supported for every \$150,000 of spending on accommodation, retail, café and other services), with a further 9 EFT jobs supported in the wider community through the employment multiplier (using ABS multiplier of 1.9 for the retail category).

In total, visitor spending stimulated by the Port Welshpool marina development will generate 19 direct and indirect FTE positions.

5.8 Associated Development Opportunities

The successful Stage 1 development of Port Welshpool Marina will provide the impetus for further investment and economic development in the township, including:

- Further expansion of the marina to include additional berths in the future (subject to planning and environmental approval).
- Further landside development, which might include an expansion of commercial activities such as a restaurant, fish sales, boat maintenance and other activities.
- Increased viability of Port Welshpool as a tourist location (especially if the Long Jetty Restoration project goes ahead) which will provide demand to support investor confidence in residential property (holiday homes) – noting in the town the current availability of vacant lots, commercial premises (shops) and tourism-related ventures (fishing tours, sightseeing tours etc).
- Specific new visitor accommodation opportunities ie, boutique hotel/motel, B&Bs, cabins and caravan parks etc, recognising the relatively limited current offer.

These longer-term investments will enhance the attractiveness of Port Welshpool as a place to visit and live, and will in turn provide the economic stimulus to support sustainable population and visitor growth, and generate new growth in local business and employment.

5.9 Return on Investment and Benefit Cost Analysis

The following three benefit cost scenarios have been prepared for this analysis:

- | | |
|-----------------|---|
| Scenario One: | 100% of wet (permanent and itinerant) and dry berths are fully leased over the project lifecycle. |
| Scenario Two: | 75% of wet (permanent and itinerant) and dry berths are fully leased over the project lifecycle |
| Scenario Three: | 50% of wet (permanent and itinerant) and dry berths leased over the project lifecycle |

Assumptions

- Benefit Cost Analysis is run over a 30 year project lifecycle
- Discount rate of 6% is used to determine Net Present Value
- Under scenarios two and three, berth lease income, floorspace occupied and visitor spending is reduced in line with vacancy rates for wet and dry berths at the marina (ie 25% and 50% respectively)
- New wet berths are leased at an average of \$5,000 pa and upgraded wet berths are leased at \$3,000 pa (this applies to the 14 existing berths which will be removed and substituted by new berths – the estimated cost differential applies compared with existing leases of \$2,000 pa).
- An operational and maintenance fee of \$500 pa applies to all permanent wet berths
- Temporary visitor berths are leased at \$40 per night
- Dry berths are leased at an average of \$1,300 pa, with an operational and maintenance fee of \$100 pa (Refer to Section 7.2)
- Council operates the marina and commercial facilities
- Marina maintenance costs are as shown in Section 6.1
- Visitor spending is based on calculations shown in Section 6.5

Results

Return on Investment (ROI)

Scenario One (100% of Berths Leased): produces a positive return on investment, with NPV revenue of \$8.4 million compared to NPV costs (capital and operational) of \$7.2 million. This provides ROI of 17% over the 30-year project lifecycle.

Scenario Two (75% of Berths Leased): produces a small loss, with NPV revenue of \$6.3 million compared to NPV costs (capital and operational) of \$7.2 million. This provides ROI of -16% over the 30-year project lifecycle.

Scenario Three (50% of Berths Leased): produces a large loss, with NPV revenue of \$4.5 million compared to NPV costs (capital and operational) of \$7.2 million. This provides ROI of -37% over the 30-year project lifecycle.

However, it is important that ROI is not considered in isolation, recognising the significant visitor spending benefits the Marina will bring to Port Welshpool, and these benefits are calculated in the following Benefit Cost Analysis.

Benefit Cost Analysis (BCA)

The development of the Port Welshpool Marina, as outlined in this report, delivers a positive Benefit Cost Ratio (BCR) under each scenario.

As Table 5.2 shows, the BCR ranges from 3.7:1.0 for Scenario One (where 100% of berths are leased) reducing to 1.8:1.0 for Scenario Three (where 50% of berths are leased).

Net economic benefits ranging from \$19.5 million (Scenario One) to \$6.5 million (Scenario Three) in NPV terms.

These results confirm a positive overall return on investment to the Port Welshpool economy that would arise from project under each of the scenarios.

Figure 5.3 shows estimated costs and benefits (NPV) arising directly and indirectly from the project over the 30 year lifecycle under each scenario.

As described earlier in this Chapter, a range of other important economic benefits (not included in the BCR analysis) will arise from the project including:

- New employment generation (construction and ongoing)
- Contracts for local businesses
- Potential new property investment (commercial accommodation, holiday homes etc).

Additionally, delivery of the Port Welshpool project is critical to the overall success of the Corner Inlet Tourism Development Project, which will support the regeneration of the Port Welshpool economy and that of the broader region.

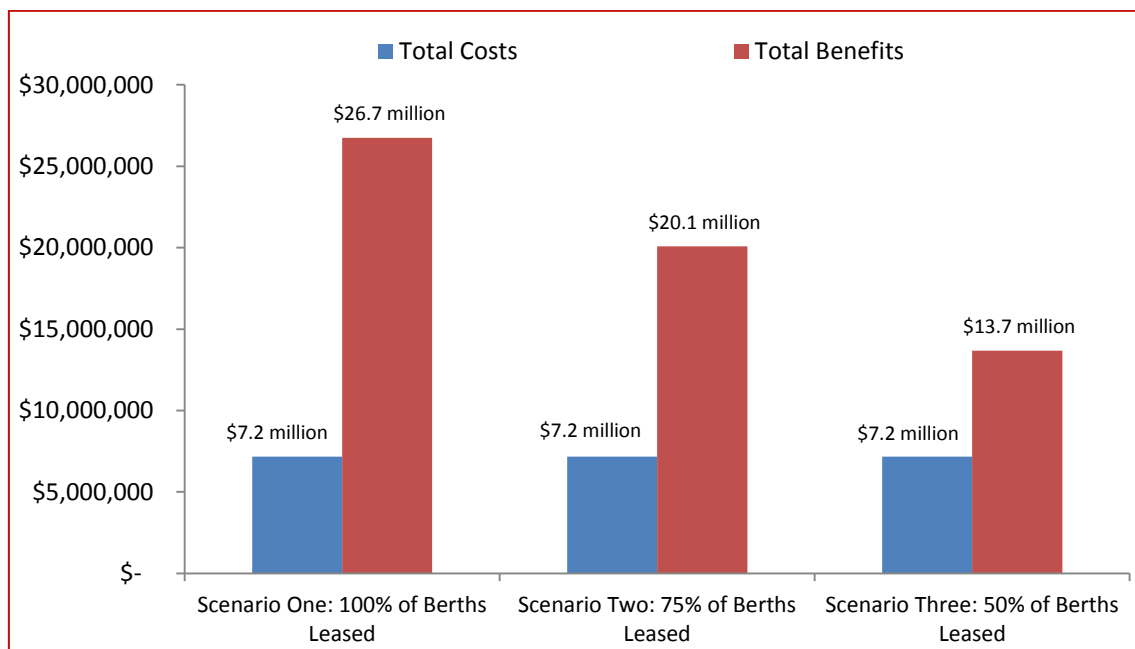
Full details of the Benefit Cost Analysis are included in the appendices.

Table 5.2: Port Welshpool Marina Development – Benefit Cost Analysis (NPV)

	100% of Berths Leased	75% of Berths Leased	50% of Berths Leased
Costs (NPV)			
Marina construction investment	\$5,266,600	\$5,266,600	\$5,266,600
Maintenance	\$1,264,730	\$1,264,730	\$1,264,730
Dry berth operations	\$632,370	\$632,370	\$632,370
Total Costs	\$7,163,700	\$7,163,700	\$7,163,700
Benefits (NPV)			
Wet berth Leases (new)	\$4,300,090	\$3,225,070	\$2,150,050
Wet berth leases (upgraded)	\$531,190	\$531,190	\$531,190
Dry berth leases	\$822,080	\$624,780	\$411,040
Visitor Berths	\$1,846,510	\$1,253,600	\$923,260
Wet berth operational and maintenance fees	\$518,540	\$411,040	\$303,540
Dry berth operational and maintenance fees	\$63,240	\$48,060	\$31,620
Commercial rental leases	\$316,180	\$237,140	\$158,090
Operational Revenues	\$8,397,820	\$6,330,870	\$4,508,770
Return on Investment	\$1,234,120	-\$832,830	-\$2,654,930
% Return on Investment	17.2%	-11.6%	-37.1%
Induced Visitor Spending	\$18,338,620	\$13,753,970	\$9,169,310
Total Benefits (Revenue and Visitor Spending)	\$26,736,450	\$20,084,840	\$13,678,080
Net Benefit	\$19,572,750	\$12,921,140	\$6,514,380
Benefit Cost Ratio (BCR)	3.7	2.8	1.8

Source: Essential Economics

Note: Figures rounded

Figure 5.3: Port Welshpool Marina Development – Estimated Total Costs and Benefits (NPV) Under Each Scenario, 30 Year Project Lifecycle

Source: Essential Economics

5.10 Conclusions

The development of Port Welshpool Marina in line with the preferred concept recommended in this report would be expected to achieve the following:

1. Leverage \$5.4 million in project investment, supporting construction-related businesses located locally and in the wider region.
2. Support 30 FTE jobs directly during the construction phase and a further 50 FTE jobs indirectly through the employment multiplier. In view of South Gippsland's industry and occupational structure, it can be expected local workers and businesses will benefit from new opportunities associated with this major project.
3. Support an estimated 7 FTE jobs in association with the activities at the marina (dry storage, café/shop, maintenance, management etc) and a further 17.5 FTE jobs in the wider economy associated with services to the marina.
4. Generate up to \$8.4 million in revenue in Net Present Value (NPV) terms, assuming 100% berth (wet and dry) occupancy is achieved. Allowing for 75% occupancy, \$6.3 million in revenue (NPV) would be generated, with 50% occupancy generating \$4.5 million in revenue (NPV).
5. Scenario One (100% berth occupancy) generates a positive Return of Investment (ROI) of 17%, with Scenario Two (75% occupancy) producing a loss of -12% ROI over the 30-year period. This analysis suggests that in a strictly financial sense, occupancy of approximately 85% would be required to achieve a 'break even' situation.
6. However, in a broader economic sense it is important to recognise the marina development will act as a catalyst to generate significant new spending stimulus for Port Welshpool by inducing up to 14,500 new visitors pa who will generate \$1.5 million (rounded) pa in new spending for the township and its businesses.
7. Increased visitor spending will generate 10 new permanent FTE jobs in the local economy, with a further 9 permanent EFT jobs supported in the wider community.
8. When marina costs, revenues and induced visitor spending benefits are considered together, the project delivers a positive Benefit Cost Ratio ranging from 3.7:1 and 1.8:1 and overall net benefit in NPV terms ranging from \$19.5 million to \$6.5 million over the lifetime of the project.
9. The successful development of Port Welshpool Marina has the potential to deliver further economic development benefits in the future as the marina expands and the Corner Inlet Tourism Project is completed. These benefits include expansion of the marina and dry berth storage, increase in landside commercial facilities, increase in commercial accommodation and residential development in the township.

These longer-term investments will further bolster visitation, visitor spending, business growth and employment in Port Welshpool and the broader region.

6 RECOMMENDED DESIGN, FUNDING STRUCTURE AND MANAGEMENT

This Chapter confirms the recommended design concept, assesses potential funding sources to facilitate the development and provides high-level advice on the potential management structure for the marina facility.

6.1 Design

The recommended marina concept minimises issues associated with geotechnical, wind climate, wave climate, tidal currents, sediment transportation and water quality matters, best utilises existing infrastructure, and provides for the accommodation of variety of powered and unpowered boat sizes and dry storage.

The following sections provide high-level advice on potential funding sources and the management of the marina facilities.

Funding Sources

Council

Council would be expected to contribute the majority capital to the project, either through Council reserves, or borrowing, and/or co-contributions as part of State and/or Federal infrastructure grant funding (using all 50/50 contribution is required).

As noted earlier, South Gippsland Council has allocated up to \$2.1 million in capital funding for the Corner Inlet Project, with some of these funds likely to be available for the Port Welshpool Marina project. The exact amount of funding will be dependent of commitments to each project, noting \$900,000 has been allocated for the approved Great Southern Bike Trail Extension.

State

The Victorian Government's Regional Growth Fund (RGF), administered through Regional Development Victoria, provides \$1 billion over eight years (which commenced in 2010) to support strategic infrastructure projects that foster economic development in regional and rural communities. State contributions through the RGF might be sought under the Strategic Initiatives component or Economic Infrastructure Program.

Federal

The National Stronger Regions Fund (NSRF) is a proposed \$1 billion fund which will replace the former Regional Development Australia Fund. The NSRF will provide grants between \$20,000 and \$10 million to meet the infrastructure needs of regional Australia on a 50/50 co-funding basis with state, local government and other sources. It is anticipated funds will be available from 2015; however, legislation is yet to be finalised.

The Federal Government will provide \$200 million each year over five years, with the potential for this contribution to increase as the economy improves. Criteria for funding will be based on the following:

- Meeting an identified and pressing community need
- Improving community connections
- Supported broadly within the community
- Representing value for money investment
- Managed and delivered within the organisation's or the communities resources
- Leveraging funding from additional sources including state governments, local councils and local businesses.

Private

Some elements of the development might be undertaken by the private sector. For example, a private operator may seek to fit-out commercial premises (café/shop) to suit particular needs or operations, while the dry berth storage facility could potentially be funded and operated privately. Once the Masterplan and Implementation Plan are completed, Council could 'test' the market for expressions of interest in delivering components of the project.

6.2 Management

In view of Council's ownership of a large amount of land in and around the marina and its long-standing relationships with other land owners in the precinct such as Gippsland Ports and the Department of Sustainability and Environment, it would be appropriate for Council to be responsible for the overall management and operation of the marina facility.

The Dry Storage Facility, however, could be operated privately noting a potential opportunity for the current operator of a dry storage facility located on Port Welshpool Road to relocate to the marina site.

Rural Councils often manage and operate such facilities, including neighbouring East Gippsland Shire Council which has responsibility for several marina facilities in the Lakes Entrance area.

A Management Plan would need to be developed by Council to ensure the marina is efficiently operated and its activities are conducted to complement existing commercial operations undertaken at the marina.

6.3 Conclusions

1. A mix of funding sources will be required to deliver the project, with Council likely to provide the majority of funds directly or through co-contribution with State and Federal grants (such as RGF and NSRF programs), while it is possible some private sector investment might be forthcoming.

South Gippsland Shire Council should oversee the management and operation of the marina under the guidance of a Management Plan. This would be the most prudent arrangement in view of Council's large land holdings and strategic relationships with Gippsland Ports and other stakeholders in the precinct.

7 SUMMARY OF KEY FINDINGS

Context

1. Port Welshpool is located in the Gippsland population catchment which includes approximately 265,000 persons, and provides a strong base for recreational boating demand.
2. The local study area includes the settlements of Welshpool and Port Welshpool which have a combined population of 620 persons and offer a limited range of visitor facilities.
3. Port Welshpool is significant in terms of commercial and recreational boating activities as it is generally well-sheltered, provides a natural deep sea port, and is attractive in terms of fishing stocks and wildlife.
4. The proposed Port Welshpool Marina development is one of five projects included in the Corner Inlet Tourism Development Project which is an initiative of South Gippsland Shire Council. Together with the Great Southern Trail Extension, restoration of Port Welshpool Long Jetty, dredging of Toora Channel and Agnes Falls Redevelopment, the marina development aims to boost economic development and tourism in this part of the Shire.

Policy

5. Strong policy support exists for the development of a marina at Port Welshpool, this includes:
 - The Victorian Coastal Strategy which provides a hierarchy of boating facilities in the Gippsland Coastal Region and identifies Port Welshpool as State Marine Precinct.
 - The Gippsland Coastal Action Plan which highlights the significance of Port Welshpool as a commercial port and an important recreational boating area with potential to cater for more boating activity. While enhanced community facilities and land based attractions are required if it is to become a state marine precinct, Port Welshpool has the potential to become regional boating precinct in the short-term.
 - The South Gippsland Shire Economic and Tourism Study which identifies Port Welshpool's boating facilities as key tourism asset for the Shire. The development of Port Welshpool Marina as part of the Corner Inlet Tourism Development Project is also identified as important for the long-term economic regeneration of the area.
 - South Gippsland Shire Council's priority projects which identify the Corner Inlet Tourism Development project as a key strategic investment and infrastructure priority for Council and the community.

Concept Plan

6. A preliminary assessment, which includes technical analysis, has been carried out to ascertain a preferred design and likely construction costs for the development.
7. Features of the preferred design include:

- 82 new wet berths and retention of commercial berths along Marginal Wharf and Fishermans Jetty
 - A new dry berth area with capacity for over 50 boats and mast up storage and access to the public boat ramp;
 - Provision for 10-14 temporary berths along the inside of the Fisherman's Jetty and along the landward side of the new walkway;
 - Berths along the existing angled jetty have been removed and provision for boats currently moored along this facility provided for in the new layout;
 - A wide berthing mix has been provided with a range of smaller (10m) and larger boats (up to 20m) able to be accommodated.
8. Structural components of the design include:
- A primary walkway, connected via gangway to the existing Jetty;
 - Three secondary walkways allowing access to the newly constructed berths;
 - A floating wave attenuator extending 150m from the existing Fisherman's Jetty westward to provide the bulk of wave protection to the marina;
 - A supplementary floating wave attenuator extending 10m from the angled jetty to provide additional wave protection to berths from west-southwest waves;
 - A vertical wavescreen of approximately 100m length adjacent to the existing Fisherman's Jetty to provide wave protection to the marina;
 - A rubble mound or sand filled geotextile breakwater running parallel to the Fisherman's Jetty to prevent infilling of the harbour by sediment.
9. Total construction costs, including contingencies, are estimates at approximately \$4.9 million (plus landside development costs).
10. Further detailed design of the marina, and a number of additional studies are required prior to approval being granted and construction works commence.

Market Assessment

11. While nearly 40 major marinas are located in Victoria, relatively few are located along the State's coast. Most of these coastal marinas are concentrated in the Lakes Entrance area, especially Paynesville and Metung, and in or around Phillip Island.
12. Importantly, no major coastal marinas are located between Phillip Island and Lakes Entrance (although some small facilities are provided, such as at Port Albert). This situation makes Port Welshpool an important strategic location for a new marina, recognising the strong population base in this general region spanning south-east Melbourne to the Latrobe Valley.
13. A number of marina developments are proposed in Westernport and Gippsland which may increase the supply of berths along this part of the coast. However, developments such as those proposed at Yaringa and Bancroft Bay are currently subject to planning and funding requirements prior to approval.
14. Boat registrations in Victoria have increased steadily over recent years, indicating ongoing growth in demand for recreational boating. For example, over the period 2003

to 2012 boat registrations increased from 147,000 to 170,000 boats, or 11% growth over the period.

15. Demand has been particularly strong in the Gippsland region where boat registrations have increased by approximately 25% (representing an additional 3,360 boats) between 2003 and 2012. A similar strong trend has been observed for the Corner Inlet area over this period, with boat registrations increasing by 22% (representing an additional 2,100 boats). These boat registration growth rates are approximately twice the rate experience across the State, highlighting the ongoing strength of the Gippsland and Corner Inlet recreational boating markets.
16. This analysis clearly shows strong demand exists for boating facilities in the general area which Port Welshpool will service; this strong demand is especially evident when population growth is taken into account, indicating an additional 5,700 boats will be registered in Gippsland over the coming 20 years.
17. Boat registration data for larger vessels (8.5m+) registered in Corner Inlet shows a 80/20 split between powered boats and yachts comprising a broad mix of sizes between 8.6m and 20m. These characteristics are of importance with regard to the optimal design and layout of the marina.
18. Price points for berths are dependent on location and quality of the facility. Generally, berths at coastal marinas are significantly cheaper than for metropolitan marinas and this should be considered as a positive demand factor for Port Welshpool. However, berth prices will need to be determined against the development's capital investment and funding model, and with regard to prices at competitor facilities in Westernport and Lakes Entrance.

Economic Impact Assessment

The development of Port Welshpool Marina is expected to achieve the following:

19. Leverage \$5.4 million in project investment, supporting construction-related businesses located locally and in the wider region.
20. Support 30 FTE jobs directly during the construction phase and a further 50 FTE jobs indirectly through the employment multiplier. In view of South Gippsland's industry and occupational structure, it can be expected local workers and businesses will benefit from new opportunities associated with this major project.
21. Support an estimated 7 FTE jobs in association with the activities at the marina (dry storage, café/shop, maintenance, management etc) and a further 17.5 FTE jobs in the wider economy associated with services to the marina.
22. Generate up to \$8.4 million in revenue in Net Present Value (NPV) terms, assuming 100% berth (wet and dry) occupancy is achieved. Allowing for 75% occupancy, \$6.3 million in revenue (NPV) would be generated, with 50% occupancy generating \$4.5 million in revenue (NPV).
23. Scenario One (100% berth occupancy) generates a positive Return of Investment (ROI) of 17%, with Scenario Two (75% occupancy) producing a loss of -12% ROI over the 30-year period. This analysis suggests that in a strictly financial sense, occupancy of approximately 85% would be required to achieve a 'break even' situation.

24. However, in a broader economic sense it is important to recognise the marina development will act as a catalyst to generate significant new spending stimulus for Port Welshpool by inducing up to 14,500 new visitors pa who will generate \$1.5 million (rounded) pa in new spending for the township and its businesses.
25. Increased visitor spending will generate 10 new permanent FTE jobs in the local economy, with a further 9 permanent EFT jobs supported in the wider community.
26. When marina costs, revenues and induced visitor spending benefits are considered together, the project delivers a positive Benefit Cost Ratio ranging from 3.7:1 and 1.8:1 and overall net benefit in NPV terms ranging from \$19.5 million to \$6.5 million over the lifetime of the project.
27. The successful development of Port Welshpool Marina has the potential to deliver further economic development benefits in the future as the marina expands and the Corner Inlet Tourism Project is completed. These benefits include expansion of the marina and dry berth storage, increase in landside commercial facilities, increase in commercial accommodation and residential development in the township.

Funding Sources

28. A mix of funding sources will be required to deliver the project, with Council likely to provide the majority of funds directly or through co-contribution with State and Federal grants (such as RGF and NSRF programs), while it is possible some private sector investment might be forthcoming.

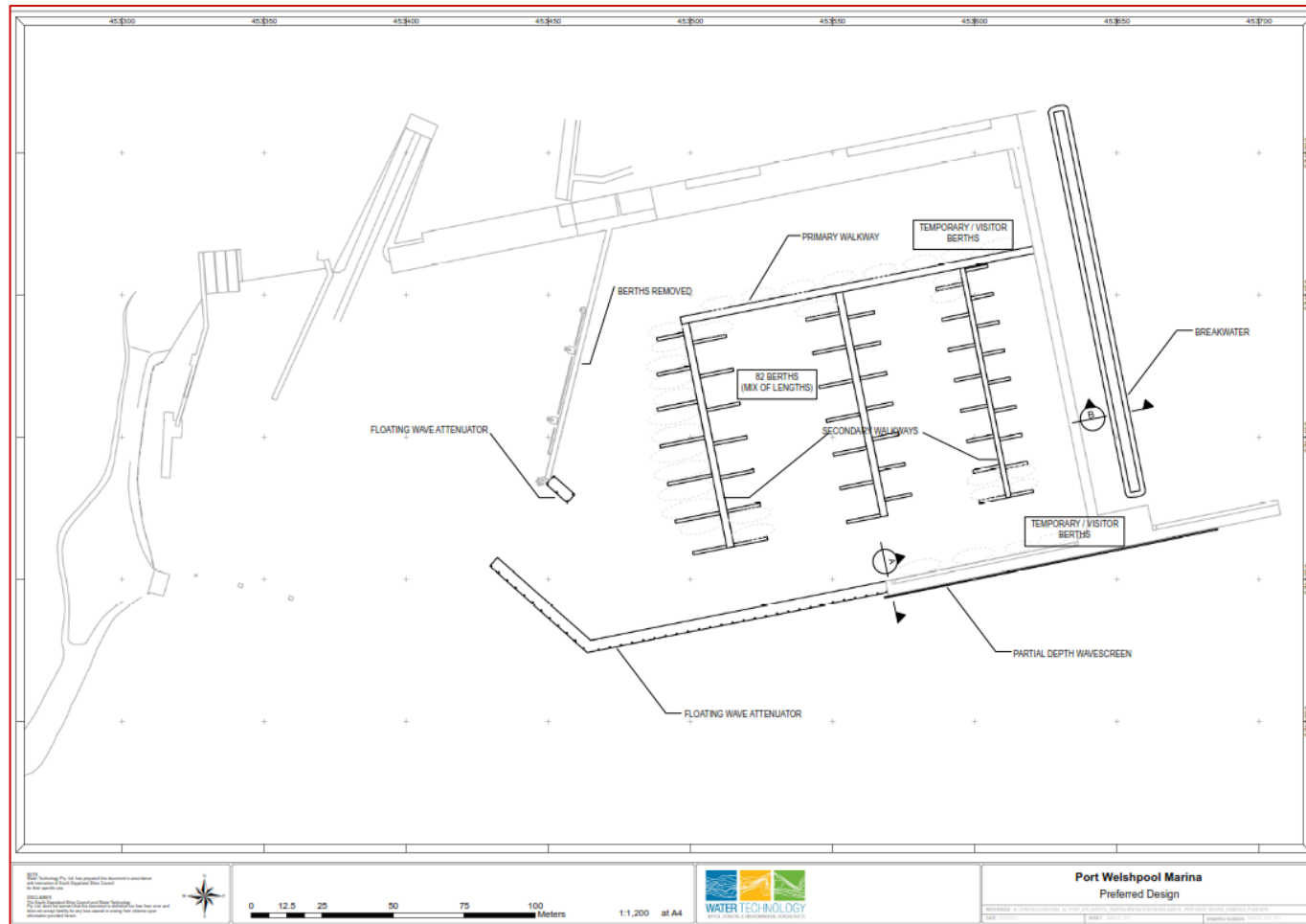
Management

29. South Gippsland Shire Council should oversee the management and operation of the marina under the guidance of a Management Plan. This would be the most prudent arrangement in view of Council's large land holdings and strategic relationships with Gippsland Ports and other stakeholders in the precinct.

APPENDICIES

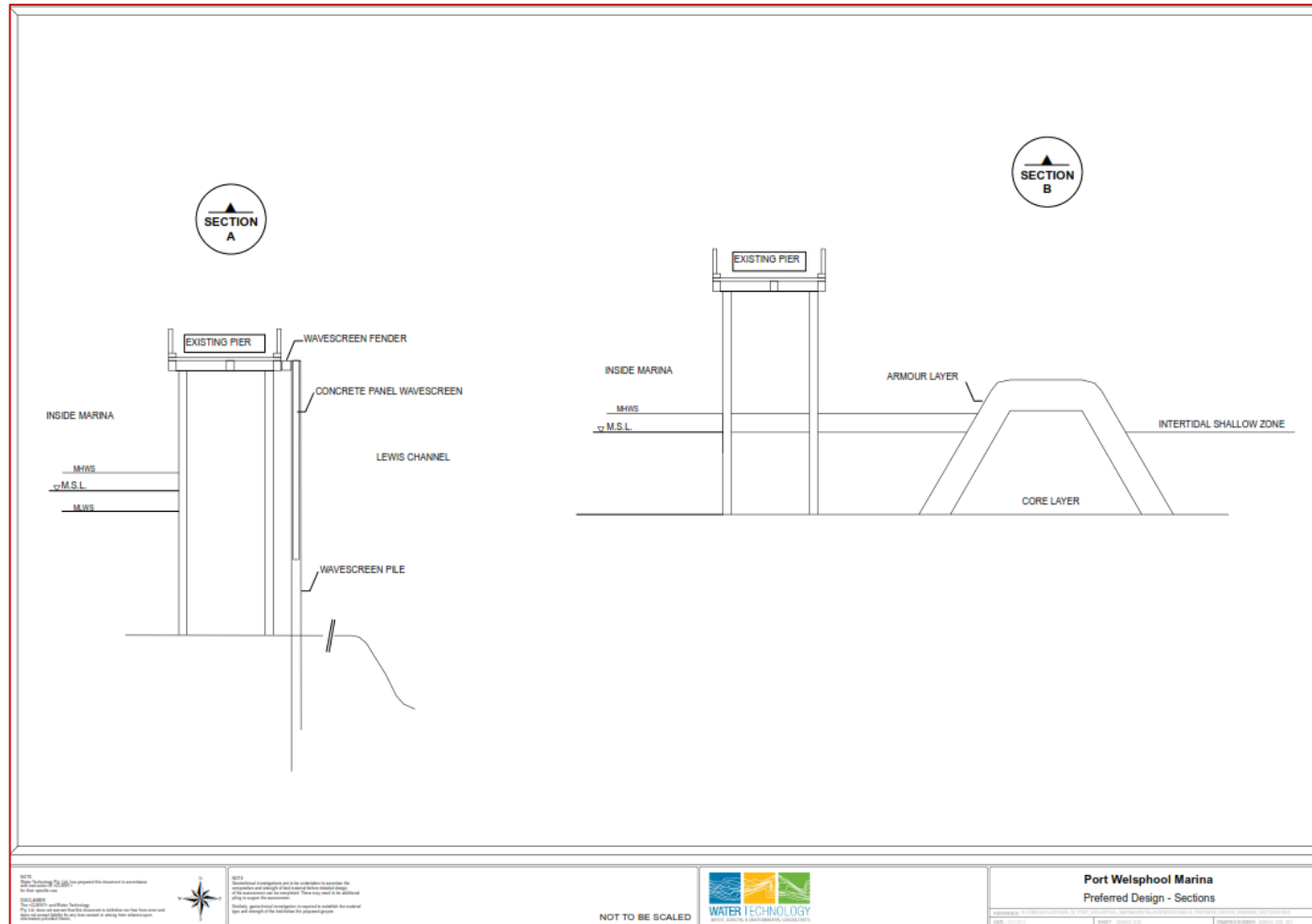
B. Design Drawings

Preferred Design – Drawing Plan



Essential Economics Pty Ltd and Water Technology

Preferred Design – Section Plan



NOT TO BE SCALED

NOT TO BE SCALED

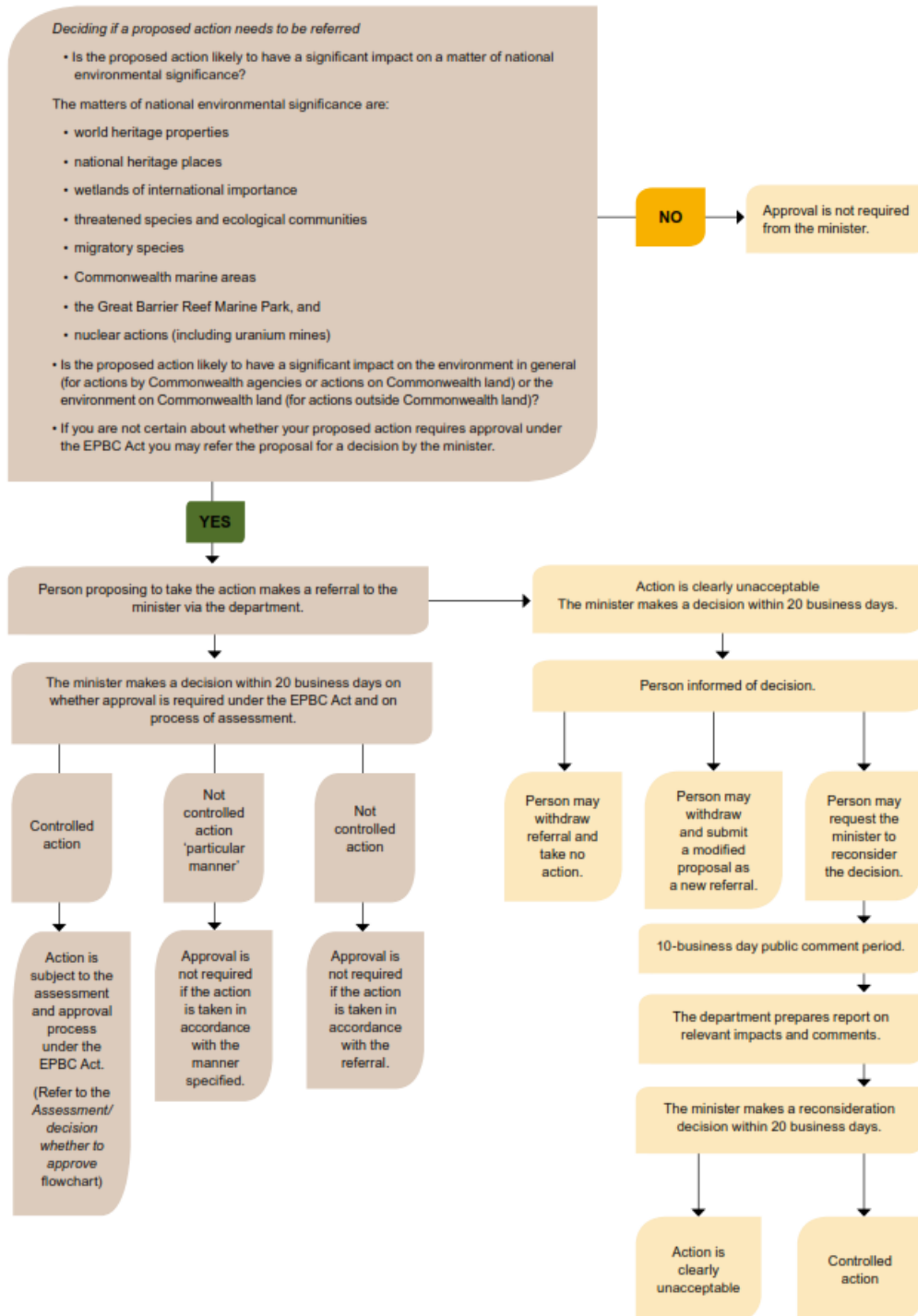
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Port Welshpool Marina
Preferred Design - Sections

C. EPBC Act Guidelines

EPBC Act environment assessment process—referral



EPBC Act environment assessment process—assessment/decision whether to approve

