REPORT SUPPORTING

THE *DRAFT AQUACULTURE (ZONES – FRANKLIN HARBOR) POLICY 2015*

Draft for Public Comment

Endorsed for Release

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1 INTRODUCTION

Across South Australia approximately 10,000 hectares of water are currently allocated across 11 zone policies to secure access to the resource. In 2012/2013, SA Aquaculture generated 1,233 direct employment and approximately 1,391 flow-on jobs, a total of 2,625 jobs in the State, 57 percent of which are located in regional South Australia.

In 2012/2013, South Australia's aquaculture production at the farm-gate was valued at $243 million, contributing 55 percent to the State's total seafood production. The direct output of aquaculture in South Australia (on-farm and downstream activities) is calculated to be $335 million. Approximately 65 percent of this wealth is generated in regional South Australia.

The Minister for Agriculture, Food and Fisheries (the Minister) may make aquaculture policies for any purpose directed towards furthering the following objects of Aquaculture Act 2001:

a) to promote ecologically sustainable development of marine and inland aquaculture;

b) to maximise benefits to the community from the State's aquaculture resources; and

c) otherwise to ensure the efficient and effective regulation of the aquaculture industry.

Aquaculture zone policies recognise the aquaculture industry as a legitimate user of the State's marine resources, providing guidance and clarity regarding the aquaculture industry's access to these resources. The policies are created to consolidate aquaculture activities in specific areas and to ensure the ecological sustainability of the existing and future industry.

In accordance with the *Aquaculture Act 2001*, the Minister must prepare a report in relation to a draft policy containing:

- An explanation of the purpose and effect of the draft policy;
- A summary of any background and issues relevant to the draft policy and of the analysis and reasoning applied in formulating the policy; and
- An assessment of the consistency of the draft policy with the Planning Strategy and any relevant Development Plan under the *Development Act 1993*; any relevant environment protection policy under the *Environment Protection Act 1993*; and any other relevant plans or policies. The objectives of these Acts and policies and how aquaculture policies are consistent with, and reflective of them, are described at Appendix D1.

Zone policies are developed to ensure that they are relevant to both community and industry needs and consider principles of ecological sustainable development. Where possible and appropriate, it is expected that issues raised are dealt with during the planning phase rather than during the individual aquaculture licence application process. Consequently, this Report supporting the Policy has been developed to inform and involve all stakeholders in the decision making process for the zoning of marine resources for aquaculture purposes. It will be referred to prescribed bodies and relevant public authorities as well as regional stakeholders, local indigenous communities, Native Title claimant groups, local government and industry, and will be made available to the general public for a period of two months for comment.

Following this period of consultation, content of the submissions received will be considered, and any consequential amendments for the draft Policy will be made. As prescribed by the *Aquaculture Act 2001*, following approval of the draft policy by the Minister, the draft policy will be referred to the Environment, Resources and Development Committee (ERDC) of Parliament. The ERDC may approve the policy; seek amendments to the policy or object to the policy. In the event the ERDC objects to the draft policy, the policy will be presented to both Houses of Parliament where either House may disallow it.

As a result of consultation and gazettal of the Policy it is proposed that amendments will be made to Land Not within a Council Area (Coastal Waters) Development Plan (LNWCA(CW)DP) in accordance with provisions under the Development Regulations 2008.

The draft Aquaculture (Zones – Franklin Harbor) Policy 2015 Report (the Report) supports the draft Aquaculture (Zones – Franklin Harbor) Policy 2015. An amendment of the gazetted (LNWCA(CW)DP), established under the Development Act 1993, to incorporate the spatial areas contained in Aquaculture (Zones – Franklin Harbor) Policy 2015 under the Aquaculture Act 2001 will be undertaken as a result of the finalisation of the zone policy. The inclusion of the new zones within the LNWCA(CW)DP will provide ongoing certainty to developers and the community in regard to appropriate locations for aquaculture development and facilitate the consolidation of existing industry and/or opportunities for moderate aquaculture development in some sectors.

The purpose of the draft Aquaculture (Zones – Franklin Harbor) Policy 2015 is to align the Franklin Harbor Aquaculture Policy hectare allocation limit with the District Council of Franklin Harbor vision for aquaculture development. No further allocation will be allowed beyond 129.5ha.

Table 1 summarises the zoning framework to be established under the Policy and summarises the classes of permitted aquaculture, the leased area and biomass permitted in the draft Aquaculture (Zones – Franklin Harbor) Policy 2015 aquaculture zone and the aquaculture exclusion zone (see Appendix D2).

ZONE / SECTOR	LEASED AREA		CLASS	BIOMASS			
	Maximum total lease area allowed in the draft Policy	Lease area already allocated (as at 18 February 2015)*		Supplementary fed		Non-supplementary fed	
				(a) Farming of prescribed wild-caught tuna	(b) Farming of aquatic animals in a manner that involves regular feeding	(c) Farming of bivalve molluscs	(d) Farming of algae
Franklin Harbor (Inner) aquaculture sector	129.5 ha bivalve molluscs with the exception of Mussels (including 2ha for communal holding of oysters and 5ha for research/education purposes)	115.68*ha intertidal and subtidal bivalve molluscs	c	Nil	Nil	Determined by licence condition	Determined by licence condition
Franklin Harbor (Outer) aquaculture sector	5.5 ha bivalve molluscs with the exception of Mussels	5.5 ha intertidal and subtidal bivalve molluscs	c	Nil	Nil	Determined by licence condition	Determined by licence condition
Franklin Harbor exclusion zone	Nil	Nil	Nil	Nil	Nil	Nil	Nil

Table 1 – Summary of zoning framework established under the Aquaculture (Zones – Franklin Harbor) Policy 2015 based on information contained in the Aquaculture Public Register.

*These sites established since the 1980s are currently being resurveyed using modern surveying techniques and this total may vary slightly as a result of this resurveying to account for currently allocated sites.

2 CURRENT AQUACULTURE

There are a total of 28 active leases and a total area of 121.18 leased hectares currently allocated in Franklin Harbor (Aquaculture Public Register, 2015). These sites established since 1980s are currently being re-surveyed using modern surveying techniques and this total may vary slightly as a result of this resurveying to account for currently allocated sites.

3 CURRENT AQUACULTURE ZONING

Cowell is a coastal town on Franklin Harbor on the eastern side of the Eyre Peninsula and the centre of an agricultural district which includes farming of wheat and sheep. The district covers an area of 3,283 km with a district population of 1,369 (ABS, 2001).

Prior to the introduction of the Aquaculture Act 2001 (the Act), aquaculture in the waters within Franklin Harbor was managed under the Spencer Gulf Aquaculture Management Plan (Primary Industries South Australia, 1996) prepared under the (ceased) Fisheries Act 1982.

The plan contained management policies for the Franklin Policy area, comprising the Cleve Management zone, the Port Gibbon Management zone, the Shoalwater Point Management zone and the Franklin Harbor Management zone. The Franklin Harbor Management Zone comprised the whole of Franklin Harbor from a line at the mouth extending from Victoria Point to the north of Germein Point at the south, to mean high water mark. The Shoalwater Point Management Zone extended from the northern council boundary near Munyaroo Conservation Park south to Victoria Point at the entrance of Franklin Harbor and covered waters to 1km offshore.

The Franklin Harbor Zone was divided into the South Western Basin (SWB) and the North Eastern Basin (NEB). The SWB included a proposal from the Council to limit allocation of Oyster leases to a total area of 112.5ha, while the NWB had no allocation limit. The 'Technical review for aquaculture management plans – Phase 2' (Brinkerhoff & SARDI, 2003) included the Franklin Harbor Management Zone. Currently, The Franklin Harbour District Council is the current planning authority over the waters for the entire bay of Franklin Harbor. The councils previous development plan (the District Council of Franklin Harbor's Development Plan (DP) 2011 included information such as: maximum lease hectares, types of permitted aquaculture, biomass limit criteria etc.

There is no current aquaculture zone for the Franklin Harbor area under the Aquaculture Act 2001. With the commencement of the Act, these Management Plans or other historical management documents were used as guiding documents, but did not carry the status of aquaculture zones under the Act.

4 PROPOSED AQUACULTURE ZONES

The effect of the draft Aquaculture (Zones – Franklin Harbor) Policy 2015 will be to:

- Create the Franklin Harbor aquaculture zone comprising of two sectors:
    1. Franklin Harbor (Inner) aquaculture sector (129.5ha).
    2. Franklin Harbor (Outer) aquaculture sector (5.5ha).

- Create the Franklin Harbor exclusion zone.
- Provide leasable area for Research and Educational purposes (5ha).
- Provide a communal holding area for oysters (2ha as part of the inner sector total).
- Consolidate existing aquaculture operations in the area.

The scope of the Policy covers the Franklin Harbor area of the Eyre Peninsula as depicted in Figure 2.

The aquaculture zones and aquaculture exclusion zones established by this Policy are described in the following sections.

4.1 Franklin Harbor aquaculture exclusion zone

The proposed Franklin Harbor Exclusion Zone is approximately 5,417 ha and it is located on the western side of Spencer Gulf, east of Franklin Harbor. The zone is depicted in Figure 3 and is described in the Policy. The Franklin Harbor aquaculture exclusion zone provides a buffer between aquaculture development, other marine resource users and areas of high conservation significance. No aquaculture activity can take place within this zone.

References to requiring marine aquaculture to be located 1000 metres seaward from the boundary of any Reserve (unless otherwise approved by the Minster) under the National Parks and Wildlife Act 1972 are contained in the Development Plans (against which development applications are assessed under the Development Act). The following is an example from the 'Land not within a Council Area (Coastal Waters)' Development Plan (page 12). The provision was originally inserted in Development Plans via the 'Statewide Marine Aquaculture and Offshore Development PAR Ministerial' gazetted on 5 June 1997.

> ***18*** *Marine aquaculture and other offshore development should be located at least:*
>
> *(a) 550 metres from a proclaimed shipwreck;*
>
> *(b) 1000 metres seaward from the boundary of any Reserve under the National Parks and Wildlife Act, unless a lesser distance is agreed with the Minister responsible for that Act.*

The relevant provision is also repeated in the SA Planning Policy Library's section on Marine Based Aquaculture (page 24).

The proposed Franklin Harbor (Inner) aquaculture sector will encircle the Franklin Harbor Conservation Park and Mills Beach (refer to Figure 3). Existing aquaculture sites were established prior to the creation of the relevant National Parks and Reserves 1km buffer. The location of the Franklin Harbor Inner sector in association to the buffer zone that now surrounds the Conservation Park is in part to allow movement during farming activities on either side of a lease during all weather conditions.

Franklin Harbor Conservation Park covers an area of approximately 1356 hectares and is located on the east coast of Eyre Peninsula in South Australia about 5 kilometres (3.1 mi) south of Cowell.

The National Parks and Wildlife Act 1972 (also known as the 'National Parks Act') is the principal legislation in South Australia in respect to the establishment and management of protected areas. The act which uses the term 'reserve' in lieu of the term 'protected area' is concerned with the establishment and management of reserves, establishment of sanctuaries, conservation of native plants and animals,

declaration of protected animals, the management of protected animals in respect to taking, keeping, farming and harvesting, and the control of hunting.

As of February 2014, reserves declared under the National Parks and Wildlife Act 1972 totalled 320 with a total area of 19,226,432 ha (47,509,550 acres) or 19% of South Australia's area. Reference to reserves include the following type: national parks, conservation parks, game reserves, recreation parks and regional reserves.

After consultation with existing aquaculture lease and licence holders it was proposed to extend the exclusion buffer zone to encompass an area that is thought to be the origin of important source nutrients for oysters grown in the zone (refer to ☆ in figure 2). The proposed zone is within the declared Franklin Harbor Marine Park. The proposed exclusion zone includes and exceeds the sanctuary zones described in the Franklin Harbor Marine Park Management Plan 2012, under the Marine Parks Act 2007.

The proposed exclusion zone includes boating channels used frequently by recreational and commercial fishers and other users of the marine resources in the area. Additionally, the exclusion zone surrounds Cowell to ensure that aesthetic values important for the tourism industry are preserved for the Cowell community.

4.2 Franklin Harbor Aquaculture Zone

The proposed zone policy contains a single zone comprised of two separate aquaculture sectors being the Franklin Harbor aquaculture (Inner) and the Franklin Harbor (Outer) aquaculture sectors.

4.3 Franklin Harbor (Inner) aquaculture sector

The proposed Franklin Harbor (Inner) aquaculture sector incorporates an area of approximately 2,930 hectares and is located between Port Neill and Whyalla and 1.4 kilometres from Cowell. The sector is depicted in Figure 3 and is described in the Policy.

Major intertidal habitats in the region include bays (intertidal mudflats and mangroves), sandy beaches and rocky shores. Of the inshore habitats that have been mapped (142,066ha), sandy bottoms comprise 61.4%, reefs comprise 27.7% and seagrass meadows comprise 10.9% (Edyvane 1999). Later surveys taken by DEWNR during the establishing of Marine Parks mapped the benthic habitat of Franklin Harbor and supported the existence of all of the above types of benthic habitats.

The proposed Franklin Harbor (Inner) aquaculture sector generally avoids areas of seagrass (see Figure 5) (Edyvane, 1999). The waters of Franklin Harbor rarely exceed 5m in depth (PPK Environment & Infrastructure Pty Ltd and SARDI Aquatic Sciences, 2002) (Figure 2).

The consolidation of aquaculture in the region will provide security for existing aquaculture lease/licence holders and reassurance to the local community regarding the management of aquaculture in the area.

Currently there are 27 leases within the area of the proposed Franklin Harbor (Inner) aquaculture sector. It is proposed that the sector will provide a maximum of 129.5 hectares of leasable area for aquaculture (including the proposed 5 hectares that will be available for research and education and 2 hectares for communal holding of oysters). Currently there are 114.18 ha of intertidal oyster farming and 1.5 ha's of

subtidal oyster farming being conducted in this proposed sector. The maximum hectare capacity of the proposed zone policy is 4.1% of the total area of the zone. Leased area that is currently allocated within the Franklin Harbor Conservation Park buffer area will remain available for intertidal aquaculture. The prescribed classes of aquaculture (see Appendix D2) proposed are the farming of bivalve molluscs (excluding mussels) and/or algae.

The primary management objective for this area is to ensure aquaculture in the area is ecologically sustainable. The main issues raised by stakeholders during consultation on the development of aquaculture zones are the perceived or actual encroachment of the aquaculture zone on other resource users, for example recreational and commercial fishing and concerns around the potential for interactions with sensitive species and habitats.

The proposed zone overlaps a small part of the Franklin Harbor Marine Park (Refer to figure 8) but due to the fact that the area of the Marine Park is classified as habitat protection, aquaculture farming is deemed to be a compatible activity in this area and is permitted to be undertaken.

4.4 Franklin Harbor (Outer) aquaculture sector

The proposed Franklin Harbor (Outer) aquaculture sector is 17.53 ha and it is located on the western side of Spencer Gulf, east of Franklin Harbor. The proposed sector serves to consolidate existing lease sites in the area.

The Franklin Harbor (Outer) aquaculture sector ranges between 5m and 12m in depth, the current speeds at Lucky Bay are moderate to high and generally the site is well flushed, although particle retention is high in summer (Parsons Brinkerhoff and SARDI, 2003).

Currently there is one lease within the area of the proposed Franklin Harbor (Outer) aquaculture sector. It is proposed that the sector will provide a maximum of 5.5 hectares of lease area for aquaculture. All of the current 5.5 ha's being farmed in the proposed sector are dedicated to the farming of intertidal oysters. The current allocation of hectares is equal to the proposed maximum capacity of the proposed zone policy. This is 31.3% of the total area of the zone.

The prescribed class of aquaculture proposed for the sector is the farming of bivalve molluscs (with the exception of mussels) and/or algae.

4.5 Research and Education

The aquaculture sector is characterised by a high level of innovation. These innovative ideas have been directed towards improved farming techniques and value adding opportunities across the relevant aquaculture sectors. This policy enables future research and environmental monitoring results which could enable industry to improve farming techniques and productivity.

The Policy sets aside 5 hectares of area for the purpose of research and education. These 5 hectares may be divided across the two sectors but cannot be used in the Franklin Harbor exclusion zone or for commercial use. It is proposed that aquatic organisms, other than those classes of aquaculture permitted within the policy, may be allowed for the purposes of research with authorisation of the

Minister for Agriculture, Food and Fisheries and only after consultation with other relevant Government departments.

5 CONSIDERATIONS

To uphold the objectives of the Aquaculture Act 2001, PIRSA Fisheries and Aquaculture will take the following matters into account in creating the Policy and encourage comment or advice for each during the public consultation period.

5.1 SUBSEQUENT DEVELOPMENT PLAN AMENDMENTS

The Franklin Harbour District Council was the planning authority over the waters for the entire bay of Franklin Harbor. This was a different situation to other bays in South Australia where the planning authority is the Development Assessment Commission (DAC). Previously the District Council of Franklin Harbor's Development Plan (DP) 2011 encompassed the waters of Franklin Harbor (Figure 4) and included information such as: maximum lease hectares, types of permitted aquaculture, biomass limit criteria etc. This level of detail is usually included in an aquaculture zone policy established under the Aquaculture Act 2001.

Franklin Harbour District Council is now in the process of relinquishing their status as the planning authority over the waters of Franklin Harbor. PIRSA and DPTI will work together to facilitate the relevant amendments to the Franklin Harbor Development Plan.

This document includes the subsequent amendments which will then be made to the Land Not Within A Council Area (Coastal Waters) Development Plan (LNWCA (CW) DP) to include Franklin Harbor (Figure 5). By including the waters of Franklin Harbor in the LNWCA (CW) DP, 'aquaculture development' is excluded from the need for approval under the Development Act 1993 and Development Regulations 2008 when undertaken in an aquaculture zone designated in the Aquaculture Act 2001.

This Policy is consistent with the provisions contained in the LNWCA (CW) DP as it seeks to ensure the ecologically sustainable development of the aquaculture industry, whilst recognising and respecting other users of the marine resource.

Therefore, subject to the approval of the Minister for Urban Development and Planning, the new aquaculture zone as outlined in the proposed Aquaculture (Zones – Franklin Harbor) Policy 2015 will be incorporated into the Coastal Waters Development Plan's maps once the relevant amendments have been made to the Franklin Harbor Development Plan (Figure 5).

5.2 Physical Characteristics

Franklin Harbor is located on the western shore of the Spencer Gulf approximately 200 km north-west of Adelaide. It is a small (80 km2) semi-closed embayment, approximately 14 km by 6 km (8,400 ha) with a coastline approximately 40 km in length (Oceanique Perspectives, 1994). The nearest township is Cowell which is located on the north-west shores of the region. It is located 111 km south from the City of Whyalla and 493 km by road from Adelaide. Cowell is the major population centre of the District

Council of Franklin Harbor and the centre of an agricultural district, farming wheat and sheep. The district covers an area of 3,283 km with a district population of 1,369 (ABS, 2001).

The Franklin Harbor Policy falls at the boundary of the Yonga and Franklin biounits (Edyvanne (1999). The Yonga Biounit is located within the Upper Spencer Gulf Region and extends from Victoria Point near the mouth of Franklin Harbor to Point Lowly on the western side of the Spencer Gulf, and from Ward Point to Point Riley on the eastern side of the gulf (PPK Environment & Infrastructure Ptd Ltd and SARDI Aquatic Sciences, 2002).

The Yonga biounit is an area of moderate wave energy with prevailing offshore winds (Edyvane, 1999). The Franklin Harbor area is subjected to south-easterlies during the summer and autumn while in winter and early spring westerly to northerly winds prevail over the region. Mean wind speeds throughout the year are moderate 11-20 km/h (Oceanique Perspectives, 1994).

A large central sand and mud bank in Franklin Harbor is exposed at low tide and divides the region into two basins (Figure 6). The basins are in the north-west and south west regions and are connected by a permanent narrow channel at low tide. The depth in the basin is shallow, rarely exceeding 3 m.

The shores around the harbor are predominately low-lying, swampy and covered with mangroves. Franklin Harbor is separated from the waters of the Spencer Gulf by a narrow rocky island called Entrance Island. The entrance to the harbor is restricted to channels north and south of Entrance Island. The narrow channel north of Entrance Island which connects Franklin Harbor with the Spencer Gulf is known as False Entrance as a sand bar renders the channel unnavigable at low tide.

The tidal regime in the vicinity of Franklin Harbor is about 1.5 m in the spring, and dodge tides are experienced in the region. A depth averaged two dimensional model was used to simulate water circulation features in summer and winter. The model indicated that the water circulation is tidally controlled and largely independent of mean seasonal wind conditions. Currents within the Harbor vary greatly, with localised peak currents as large as 100 cm/sec. The exchange period was estimated to be between 5-25 hours (Oceanique Perspectives, 1994).

Water temperatures in Franklin Harbor range from 13.3ºC in the winter to 23.3ºC in summer. Salinity ranges from 35.5 ppm in the winter to 38.8 ppm in the summer; higher evaporation during the summer in the shallow waters is likely the main driver for higher salinities in the summer (PPK Environment & Infrastructure Pty Ltd and SARDI Aquatic Sciences, 2002).

The proposed Franklin Harbor zone policy falls within the Franklin Harbor Marine Park. The benthic habitat of the park was characterised in the "Environmental, Economic and Social Values of the Franklin Harbor Marine Park", Part 1 (Department of Environment and Natural Resources, 2010) (Table 3).

Table 2 Benthic (subtidal) habitats found in the Franklin Harbor Marine Park.

Benthic Habitat	Area (km2)	% of Park
Bare sand	277	44%
Dense seagrass	244	39%
Medium seagrass	23	4%

Heavy limestone reef	1	<1%
Low profile platform reef	75	12%
Unmapped	3	1%

* habitat areas have been rounded to the nearest whole number
**habitats included are those found from mapping at a resolution of 1:100,000

Specific mapping of the benthic habitat of the area (Figure 7 & 8) suggests that dense seagrass beds are widespread throughout the area of Franklin Harbor with small calcareous reef patches, dominated by brown macroalgae. These are surrounded by sandy islands, sandy seafloor and dense seagrass meadows. The eelgrass Heterzostera tasmanica is sparsely interspersed in the subtidal and nearshore areas (Edyvane, 1999).

5.3 Water Quality

Available information regarding water quality within the Franklin biounit is based on water samples collected from Franklin Harbor. Daily water samples taken during February and March in 1992 reported an oxygen content ranging from 5.9 mg/l to10.7 mg/l. Measurements of pH taken during the same time period ranged from 7.85 to 8.53 (Hone 1996). From a small number of samples taken during 1999, ammonia (NH3-N) levels averaged about 0.019 mg/l, and nitrate (NO3-N) averaged less than 0.005 mg/l (Oceanique Perspectives 1994).

5.4 Indigenous Heritage

PIRSA Fisheries and Aquaculture acknowledges and recognises the native title rights and interests of South Australian aboriginals. It is further recognised that it is essential to the well-being of aboriginal people in the communities that their traditional values and practices are respected and their heritage and native title interests considered when aquaculture developments are planned for a particular area. PIRSA Fisheries and Aquaculture facilitates the involvement of local Aboriginal representatives in its process for developing and amending aquaculture policy and zoning.

There is no current Indigenous Land Use Agreements (ILUA) in this area however a search of the Register of Aboriginal sites and objects administered by the Department of State Development, Aboriginal Affairs and Reconciliation indicates that a consent determination over the claim for the Arabana people has been made by the Federal court recognising their non-exclusive native title rights (Barngarla Native Title Claim (Tribunal No SC1996/004).

The Barngarla Native Title Claim (SC1996/004) extends into coastal waters and it includes the following Local Government Regions: City of Port Lincoln; Port Augusta City Council; The Corporation of The City of Whyalla; The DC of Ceduna; The DC of Cleve; The DC of Elliston; The DC of Franklin Harbor; The DC of Kimba; The DC of Lower Eyre Peninsula; The DC of Streaky Bay; The DC of Tumby Bay; The Flinders Ranges Council; UIA Whyalla; Unincorporated, Wudinna District Council (National Native Title Tribunal, Commonwealth of Australia 2013b).

A search of the Central Archive, which includes the Register of Aboriginal Sites and Objects (the Register), administered by the Department of State Development, Aboriginal Affairs and Reconciliation (ASD-AAR), has four entries for Aboriginal sites in the Franklin Harbor area (Figure 9). These entries for Aboriginal sites are described as three arrangement sites and one burial site.

The Register is not a comprehensive record of all Aboriginal sites and objects in South Australia. Sites or objects may exist in the proposed development area, even though the Register does not identify them. All Aboriginal sites and objects are protected under the Aboriginal Heritage Act 1988 (the Act), whether they are listed in the Register or not. Land within 200 metres of a watercourse (particularly the River Murray and its overflow areas) in particular, may contain Aboriginal sites and objects.

It is an offence to damage, disturb or interfere with any Aboriginal site or damage any Aboriginal object (registered or not) without the authority of the Minister for Aboriginal Affairs and Reconciliation (the Minister). If the planned activity is likely to damage, disturb or interfere with a site or object, authorisation of the activity must be first obtained from the Minister under Section 23 of the Act. Section 20 of the Act requires that any Aboriginal sites, objects or remains, discovered on the land, need to be reported to the Minister. Penalties apply for failure to comply with the Act.

If any Aboriginal significant areas are encountered during community engagement, PIRSA Fisheries and Aquaculture will advise the Minister for Aboriginal Affairs and Reconciliation accordingly.

5.5 Non-indigenous and natural heritage sites

A search on the Heritage Places database and the Australian Heritage Places Inventory database indicated that one heritage site is recorded under the *Heritage Act 1993* for the area; the Franklin Harbor Hotel. The database includes information and location maps of the state's significant historic places.

5.6 Marine Parks

The proposed Franklin Harbor aquaculture zone lies within the boundaries of the Franklin Harbor Marine Park (Figure 10). The park covers 636 km^2 and is located in the central western side of Spencer Gulf between Gibbon Point and Munyaroo Conservation Park (DEWNR, 2010).

Marine Parks are the principal tool under the *Marine Parks Act 2007* for managing both current and future activities that take place in marine parks. The proposed Franklin Harbor zone policy and aquaculture activities in the Franklin Harbor Marine Park are integrated to achieve multiple-use outcomes, in accordance with the objects and the four types of zones established by the *Marine Parks Act 2007*.

Located on the central western side of Spencer Gulf, between Gibbon Point and Munyaroo Conservation Park, the park is at the intersection of several distinct environments and shaped by the more saline, warmer waters of Upper Spencer Gulf. The park features one of South Australia's most important nurseries for King George whiting, as well as for prawns, sardines, scalefish and blue swimmer crabs.

Fishing is popular in the sheltered waters of the park, both on land and by boat as is diving. Australian sea lions utilise the area as do a number of local and migratory shorebirds. There are also various

species of sea dragons, rare types of seagrass, and large colonies of the stony coral, *Plesiastrea versipora*, which can grow to 3 meters in diameter. The park is also home to rare stromatolites, which are mineral formations often made by blue-green algae and represent some of the oldest examples of life on earth.

Access to Franklin Harbor Marine Park is from Cowell, Port Gibbon and Lucky Bay.

The *Marine Parks Act 2007* (section 13(1)) requires that management plans:

- must establish the various types of zones within the park and define their boundaries; and
- may identify and define the boundaries of special purpose areas within the park and set out the activities that will be permitted in the areas.

The *Marine Parks Act 2007* makes provision for the following types of marine park zones:

(a) **a general managed use zone** – is a zone established so that an area may be managed to provide protection for habitats and biodiversity within a marine park, while allowing ecologically sustainable development and use. Aquaculture activity is deemed a compliant activity within such a zone. Within this zone aquaculture farming activities are deemed a compatible activity that is permitted to be undertaken.

(b) **a habitat protection zone** – is a zone primarily established so that an area may be managed to provide protection for habitats and biodiversity within a marine park, while allowing activities and uses that do not harm habitats or the functioning of ecosystems. Within this zone aquaculture farming activities are deemed a compatible activity that is permitted to be undertaken.

(c) **a sanctuary zone** – is a zone primarily established so that an area may be managed to provide protection and conservation for habitats and biodiversity within a marine park, especially by prohibiting the removal or harm of plants, animals or marine products

(d) **a restricted access zone** – is a zone primarily established so that an area may be managed by limiting access to the area.

There are two sanctuary zones within the exclusion zone of the proposed policy. The proposed Franklin Harbor aquaculture zone is located within a general managed used zone (Department of Environment Water and Natural Resources, 2012). As is the case with Habitat Protection zones, aquaculture farming activities are deemed a compatible activity that is permitted to be undertaken.

This marine park overlays one other protected area, the Franklin Harbor Conservation Park (Department of Environment Water and Natural Resources, 2012).

The coastal wetlands around Franklin Harbor are particularly vulnerable and the seagrass meadows less resilient to physical disturbance. In Franklin Harbor, the coastal salt marshes are backed by an expanse of mangroves leading to a shore of intertidal mudflats. Mangroves provide important rookeries for other seabirds such as cormorants (pied and black-faced) and white-faced herons. As such, the proposed aquaculture zone has been designed so as to minimise the risk of disturbing these sensitive and important habitats.

5.7 Marine Flora

Extensive seagrass meadows exist in Franklin Harbor. Subtidal communities on moderately exposed coasts (eg. Cape Driver and Arno Bay) are dominated by Ecklonia radiata and mixed fucoids (eg.Sargassum linearifolium, S. spinuligerum, S. lacerifolium and S. distichum), with various Cystophora species as subdominants. Rocky surfaces are dominated by the encrusting and articulated coralline algae (e.g. Amphiroa) and the prostrate brown alga, Lobophora variegata. Seagrass meadows consisting of Posidonia sinuosa and Amphibolis antarctica in shallow water dominate sandy substrates, with Heterozostera tasmanica and Amphibolis antarctica as subdominants.

5.8 Marine Fauna

A great diversity of marine fauna inhabits the Franklin biounit principally due to the variety of different habitats. The area enclosing Franklin Harbor contributes greatly to the biodiversity of the region. Some of the major fish, crustacean and molluscan species within the area include the King George Whiting, Yellowfin Whiting, Sand Flathead, Yelloweye Mullet, Australian Salmon, Snapper, Snook, Garfish, Blue Swimmer Crab, Tommy Rough, Trevally, Leatherjacket, Western King Prawn and Southern Calamari. In addition to providing a sheltered fish nursery area, mangroves also provide a habitat for migratory wading birds.

This region supports a variety of seabirds including Pied Cormorants, Black-faced Cormorants, Caspian Terns, White-faced Herons and Grey Teal flocks by providing safe breeding and feeding sites. The threatened White-bellied Sea Eagles and Musk Ducks have been sighted within the region. The mangrove and tidal saltmarsh communities near Arno Bay (Salt Creek) are also of ecological importance, providing important nursery, feeding and breeding areas for many species of fish and crustaceans, including many of those species found in the Franklin Harbor area. Seagrass meadows located throughout the region also provide important nursery areas for numerous fish species (Edyvane, 1999).

5.9 Reserves and Conservation areas

The Franklin Harbor aquaculture zone is adjacent to Franklin Harbor Conservation Park (Figure 3), declared in 1976. The park is about 1356 ha, and it is located 5 km south of Cowell. The park includes the long narrow, sandy peninsula that protects the Harbor and four islands near the mouth. Two of the islands and the protected side of the peninsula feature a low growing woodland of avicennia marina and samphire shrubland (arthrocnemum spp). The seaward side of the peninsula features a sandy beach backed by minor areas of open scrubland dominated by boxthorn, with scattered callitris, santalum, leucopogon and nitraria (Department of Sustainability, Environment, Water, Population and Community, 2013).

Franklin Harbor Bay provides habitat for migratory waders and the islands provide a safe roosting and feeding site for seabirds. The islands and the sheltered waters on the Harbor side of the Peninsula have low woodland of mangroves and a tidal marsh. Dense beds of seagrass meadows are widespread throughout the bay and are important sites for spawning, breeding or shelter for numerous fish species.

The Franklin Harbor area is listed on the Register of the National Estate as a wetland of national significance recognising the area as a good example of a wetland occurring in Australia, its importance as the habitat for different animals and a place of outstanding cultural significance (Department of Sustainability, Environment, Water, Population and Community, 2013).

There are no aquatic reserves under the Fisheries Management Act 2007 within the Franklin Harbor zone policy area; however a netting closure is in place for Franklin Harbor.

The Franklin Harbor exclusion zone has been designed to take into account the environmental values of the area. The proposed Franklin Harbor aquaculture (Inner) aquaculture sector will encircle the Franklin Harbor Conservation Park and Mills Beach. The existing aquaculture sites were established prior to the establishment of buffer zones so the location of the sector in association to the buffer zone that now surrounds the Conservation Park is in part to allow movement during farming activities on either side of a lease.

5.10 Matters of national environmental significance

The Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) addresses the protection of matters of national environmental significance.

A search of the Protected Matters Database was conducted on the Australian Government Department of the Environment and Water Resources website (Protected Matters Search Tool) to obtain a list of the threatened and migratory species that are considered to potentially occur in the region or whose habitat is likely to occur within the area. The tool indicated that 32 threatened and 41 migratory could potentially occur in the proposed area. This data is derived primarily from general distribution maps, and accordingly and in particular given the physical characteristics of the proposed zones it is possible that at least some of the species listed will not occur.

Threatened and migratory species listed on the data base include but are not limited to —

- Australian Sea-lion (*Neophoca cinerea*) (listed as vulnerable) – species or species habitat may occur within area.
- Great white shark (*Carcharodon carcharias*) (listed as vulnerable) – species or species habitat may occur within area.
- Albatross – two species are listed as endangered and 5 species are listed as vulnerable; species or species habitat may occur within area.
- Petrels – two species listed as endangered and two species listed as vulnerable; species or species habitat may occur within area.
- Many migratory species – consisting of bird, marine mammals and shark which may migrate in and out of the area, occur within this region.

The legislative framework dealing with these species is described in Appendix D3.

The nearest breeding and habitat areas for the New Zealand Fur-seal (Arctocephalus forsteri) and the Australian sea-lion is Sir Joseph Banks Conservation Park some 110 kilometres to the south. A major Australian sea-lion colony exists at Dangerous Reef located approximately 130 kilometres to the south of Franklin Harbor.

There are no sea-lion, seal colonies or whale breeding areas in close proximity of the proposed Franklin Harbor aquaculture zone.

5.11 Commercial and Recreational Fishing

New zone policies will be cited in a manner that minimises unnecessary impact on commercial and recreational fishing activities.

Nursery and habitats

The waters off Franklin Harbor support a number of fisheries. Dense beds of seagrass meadows are widespread throughout the bay and are important sites for spawning, breeding and shelter for numerous fish species. The sheltered waters of the Harbor offer the fishermen King George whiting, snapper, squid, mullet, flathead, garfish, snook, Australian salmon (previously known as tommy ruff) and blue crabs.

Commercial Fisheries

The proposed aquaculture zones are located in block 20 and 22 of the Marine Scalefish Fishery, the Central Zone Abalone Fishery, the Rock Lobster Fishery, and the Blue Crab Fishery area.

Commercial fishing in the Franklin Harbor area is modest given the physical characteristics of the area. The few commercial operators in the area concentrate on line fishing under the marine scalefish fishery targeting King George whiting, yellowfin whiting, flathead, snook, southern calamari and silver whiting.

A general net closure under the Fisheries Management Act 2007 is in effect for Franklin Harbor waters as the area is an important nursery area for King George Whiting. Under the Fisheries Management (General) Regulations 2007 Schedule 7 the use of commercial fish nets is not permitted in a certain area of Franklin Harbor. The area in which commercial fish nets are not allowed to be used encompass the waters of or near Franklin Harbor contained within and bounded by a line commencing at Mean High Water Springs closest to 33°43'33.93" South, 136°59'24.61" East (Victoria Point), then south-westerly to the location on Mean High Water Springs closest to 33°44'30.71" South, 136°58'09.97" East (Germein Point), then beginning northerly following the line of Mean High Water Springs to the point of commencement.

Recreational Fisheries

A state-wide recreational fishing survey carried out by PIRSA Fisheries in 2007/08 provided further data on the use of these waters by South Australian residents who recreationally fished.

Recreational fishing is a popular activity in the Harbor. Common species found in Franklin Harbor for this purpose include King George Whiting, snapper, squid, mullet, flathead, garfish, snook, Australian salmon tommy ruff and blue crabs. An all-weather boat ramp is located adjacent to the town of Cowell and recreational boating channels have been constructed and the channel recently deepened to facilitate recreational fishing in the Harbor and adjacent waters. Licensed Charter Fishing operations also operate in Franklin Harbor.

5.12 Historic Shipwrecks

One of the principles of development control in the Land Not Within a Council Area (Coastal Waters) (LNWCA(CW)) Development Plan requires that "marine aquaculture development must be located at least 550 metres from an historic shipwreck". Whilst aquaculture within a zone delineated within the LNWCA(CW) Development Plan is excluded from the definition of development (Schedule 3, clause 16 Development Regulations (2008), this minimum distance will be maintained in relation to any aquaculture operations in all aquaculture zone policies.

There are no Shipwrecks declared under the Historic Shipwrecks Act 1981 or the Commonwealth Historic Shipwrecks Act 1976 in the proposed zone.

5.13 Shipping and Navigation

Ports

There are no major ports within Franklin Harbor. During 2013 all navigation beacons in Franklin Harbor have been upgraded which has resulted in some modifications to the existing channel alignment.

Natural launching sites, safe and secure anchorage areas

There is an all-weather boat ramp that is located adjacent to the township of Cowell and breakwater located adjacent to the boat ramp providing an all-weather launching site. The Lucky Bay ferry operates out of Lucky Bay across Spencer Gulf to Wallaroo and back. The ferry route will not impeded by the proposed zone.

Shipping

Aquaculture development within the zone should avoid commercial shipping and recreational vessel movement patterns (refer to figure 8).

Conditions on aquaculture leases and/or licences stipulate that navigation marks be installed whenever structures are located in the leased area, therefore aquaculture infrastructure should not pose a navigational hazard.

5.14 Tourism

Franklin Harbor is a popular beachside holiday destination where visitors enjoy activities such as diving, fishing and boating (Tourism Eyre Peninsula, South Australian Tourism Commission). The proposed Franklin Harbor aquaculture zone has been situated so that visual and recreational amenity in the area is maintained.

5.15 Sites of scientific importance

In relation to marine mineral reserves, there appears to have been no identification of significant deposits within Franklin Harbor. There are however significant Jade deposits inland near Cowell. The deposits have been identified as among the largest known nephrite jade deposits in the world with the jade bodies typically having elongate, lensoid shapes in outcrop with a geological setting of Mesoproterozoic dolomitic marble host rocks.

5.16 Biosecurity

The health status of farmed and wild stock in the area, with particular emphasis on the occurrence of diseases listed as notifiable under the Livestock Act 1997, is taken into consideration on licences.

6 REGIONAL IMPACT ASSESSMENT

Matters raised in the Policy may:

- Directly affect a region or regions;
- Indirectly affect a region or regions;
- Affect or relate to regional issues; or
- Treat or affect regional and metropolitan areas differently.

Accordingly, it is considered appropriate to fully assess the effect of the Policy within the region. This section contains an assessment of the expected effects of the zone policy on the region.

6.1 Stakeholders

The following groups will be affected by the proposed zoning and policy:-

The Aquaculture industry, local community, recreational and professional fishers, recreational users and the recreational boating sector.

The following groups may be affected by the proposed zoning and policy:-

Native title claimants and other indigenous groups, local government, Government agencies, commercial shipping, conservation groups and other NGOs, research organisations, boards and other relevant planning and natural resource management bodies, tourists and the tourism industry.

PIRSA will seek and/or invite input and guidance from these parties throughout the aquaculture zone consultation process.

6.2 Consultation undertaken in relation to regional issues

Following preparation of the draft policy and report, the Minister is required to refer both documents to prescribed bodies and to any public authority whose area of responsibility is, in the opinion of the Minister, likely to be affected by the policy (section 12(4)(a) of the Aquaculture Act 2001).

The following are listed as prescribed bodies under the Aquaculture Regulations 2005:-

- Aboriginal Legal Rights Movement Incorporated;
- Conservation Council of South Australia Incorporated;
- Local Government Association of South Australia;
- Seafood Council SA;
- South Australian Industry Council Incorporated;

- South Australian Aquaculture Council;
- South Australian Recreational Fishing Advisory Council;
- Any registered representatives of native title holders or claimants to native title in land comprising or forming part of an aquaculture zone or area to which the policy applies;
- Any person holding an aquaculture licence or aquaculture lease over an area comprising or forming part of a zone or area to which the policy applies; and
- Any regional NRM Board (within the meaning of the *Natural Resources Management Act 2004*) responsible for a region comprising or forming part of an aquaculture zone or area to which the policy applies.

In addition to prescribed bodies, PIRSA Fisheries and Aquaculture consults with the following parties:

Industry leaders; Department of Planning; Transport and Infrastructure (DPTI); SA Tourism Commission (SATC); Environment Protection Authority (EPA); Department of Health and Aging (DHAU); Native Title Unit; Department of the Premier and Cabinet: Aboriginal Affairs and Reconciliation Division; Office of Regional Affairs; Community and Local Government Relations; Regional Local Government Association; appropriate Regional Development Board; appropriate Local Council/s; appropriate progress association/s and Community groups within the local government area; Department of Environment Water and Natural Resources (DEWNR) including the Coast Protection Board, Natural and Cultural Heritage and Regional Conservation; Primary Industries and Regions SA (PIRSA): Legal Unit, Fisheries and Aquaculture, Rural Solutions SA and the South Australian Research and Development Institute (SARDI).

The Policy and the Report describing the zoning proposal is distributed to key stakeholders as the basis for consultation. These documents are available on the PIRSA Fisheries and Aquaculture website for 2 months.

Public notices are placed in The Advertiser and relevant local papers, the local papers for Cowell area are Eyre Peninsula Tribune and Whyalla News seeking comment from members of the public.

To provide stakeholders with the opportunity to speak directly with PIRSA Fisheries and Aquaculture Officers, public briefings in the region are organised to take place during the 2 month consultation period. Additionally, all existing lease and licence holders in the zone area will be advised during the 2 month consultation period of the policy proposal by letter.

6.3 Potential Effects

The Policy defines zones within State waters where specified classes of aquaculture will be permitted and zones where no aquaculture will be permitted (i.e. exclusion zones) for the waters within the Policy area. Aquaculture has a number of potential economical, social and environmental effects. These are included in the following section. All comments are invited that could improve this information.

Specific favourable attributes of the Franklin Harbor aquaculture zone include:

- Suitable physical characteristics: the habitat of Franklin Harbor where the proposed aquaculture zone is to be located is comprised of bare sand and shallow water, suitable for intertidal shellfish aquaculture.

- Local industry support services including boat launching.
- Basic infrastructure (roads, electricity, telecommunications).

For existing farmers in the Franklin Harbor area, favourable factors include:

- Familiarity with local waters, infrastructure, institutional conditions, and commercial networks.
- Proximity to existing operations, reducing travel and communications costs.
- Established relationships with service and input providers.
- Optimal environmental conditions for safe operation and maximum productivity (e.g. wave height, currents).
- Acceptance by local community.

Without zoning, aquaculture development may occur in an ad-hoc manner (albeit subject to the Development Plan policy) and the full economic potential of the industry is unlikely to be achieved. If zoning does not occur in the Franklin Harbor area, future aquaculture development would rely on the pilot lease application process. This is not a strategic planning process and it could lead to an unplanned or ad hoc approach to resource use, it is less streamlined for industry participants, less efficient use of the area and may lead to costly planning disputes.

6.3.1 Economic and Employment Factors

The aquaculture industry plays an important role in creating wealth and prosperity for South Australia, particularly in regional communities (Herreria et. al., 2004; EconSearch, 2014). The aquaculture industry in South Australia has recorded strong growth in volume and product range during the past decade and this trend is set to continue. Aquaculture is evolving, with more environmentally sustainable farming systems and practices such as; inland ventures using recycled water, integrated multi-trophic aquaculture and aquaponic-type production systems.

Aquaculture can provide significant investment and employment opportunities to rural and regional economies. A report completed by EconSearch (2014) estimated the direct output of oyster farming in South Australia in 2012/13 to be $103.9m ($35.3m on-farm and $68.6m in downstream activities). Direct employment was estimated to be in excess of 687 full time equivalent positions (FTE) with 553 flow-on jobs, giving total employment of 1,240 FTE.

In relation to the Franklin Harbor component of the states oyster industry's contribution to the state's economy it was estimated in 2012/13 that the direct output of oyster growing in the region was $9.6m ($4.4m on-farm and $5.2m in downstream activities. Direct employment was estimated to be in excess of 56 full time equivalent positions (FTE) with 51 flow-on jobs, giving an estimated total employment of 107.7 FTE.

Most evidence of the economic benefits of aquaculture zoning is qualitative rather than quantitative.

Aquaculture zoning has a range of potential economic benefits, including:-

- Facilitating industry growth – zoning provides a framework that facilitates the sustainable development of aquaculture activities, therefore helping to promote significant investment and to enhance employment opportunities in rural and regional economies.

- Optimizing the use of the sea – zoning helps to ensure that maximum benefits are derived from the use of the sea by encouraging activities to take place where they bring most value, and do not devalue other activities.
- Reducing costs – zoning can reduce the cost of regulation, planning and decision making, and can eliminate duplication in approval processes. For example by removing the need to obtain Department of Planning approval where the zone has been included in the Land Not Within A Council Area (Coastal Waters) Development Plan.

6.3.2 Social effects

The majority of the small communities on Eyre Peninsula, including Franklin Harbor, were established to service the agricultural industry. The impact of the rural downturn and employment opportunities provided by the mining boom has led to a drain of its youth to the metropolitan areas and to mining centres. This has impacted on small businesses, and resulted in an ageing population.

The social structure of the Franklin Harbor community has seen change over the last 20 years with a growing proportion of retirees and increased tourist activity.

As this policy is consolidating the existing industry within Franklin Harbor there is likely to be little social effect above what the aquaculture industry currently contribute to the area and its economy.

6.3.3 Environmental Effects

There is already significant shellfish aquaculture development within this area. The consolidation of the existing industry will have no environmental effects but will protect the environment by creating exclusion zones over sensitive area and by limiting aquaculture development to the current areas and activities. A risk assessment is undertaken by PIRSA Fisheries and Aquaculture for each licence application as part of the Environmental Monitoring Program so that each risk is managed according to its priority and complexity (Appendix D4). Current research projects will also assist in further understanding and predicting the potential risks, interactions and impacts of aquaculture activities (Appendix D5).

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APPENDIX A – GLOSSARY OF TERMS

Adaptive Management	Management involving active response to new information of the deliberate manipulation of fishing intensity or other aspects in order to learn something of their effects. Within a stock, several sub-stocks can be regarded as experimental units in which alternative strategies are applied.
Assimilative capacity	The capacity of a natural body of water to receive wastewaters without deleterious effects to aquatic life.
Benthic	Of or relating to or happening on the bottom under the ocean/lake.
Biodiversity	The variability among living organisms from all sources (including terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are a part) and includes: (a) diversity within species; and (b) diversity of ecosystems.
Biomass	The total live weight of a group (or stock) of living organisms (e.g. fish, plankton) or of some defined fraction of it (e.g. spawners), in an area, at a particular time. Any quantitative estimate of the total mass of organisms comprising all or part of a population or any other specified unit, or within a given area at a given time; measured as volume, mass (live, dead, dry or ash-free weight) or energy (joules, calories).
Bivalve mollusc	Any mollusc belonging to the taxonomic class Bivalvia, being characterised by a shell consisting of two hinged sections. Includes clams, cockles, mussels, oysters, pipis, scallops etc.
Broodstock	Aquatic organisms from which subsequent generations are intended to be produced for the purpose of aquaculture.
Carrying capacity	The maximum population of a given organism that a particular environment can sustain.
Closures	Prohibition of fishing during particular times or seasons (temporal closures) or in particular areas (spatial closures), or with a particular gear, or a combination.
Depauperate	Lacking species variety.
Ecologically sustainable development (ESD)	ESD is described in the *Aquaculture Act 2001* as: 'Development is ecologically sustainable if it is managed to ensure that communities provide for their economic, social and physical well-being while— (a) natural and physical resources are maintained to meet the reasonably foreseeable needs of future generations; and (b) biological diversity and ecological processes and systems are protected; and (c) adverse effects on the environment are avoided, remedied or mitigated. In making decisions as to whether development is ecologically sustainable or to ensure that development is ecologically sustainable—

	(a) long-term and short-term economic, environmental, social and equity considerations should be effectively integrated; and (b) if there are threats of serious or irreversible environmental harm, lack of full scientific certainty should not be taken to justify the postponement of decisions or measures to prevent the environmental harm'.
Ecosystem	A dynamic complex of plant, animal, fungal, and microorganism communities and the associated non-living environment interacting as an ecological unit.
Habitat	The place or type of site in which an organism naturally occurs.
Harvest	A productivity measuring technique relating to the yield of seasonal aquaculture produce.
Infauna	Aquatic organisms (animals only) that live within particulate media such as sediments or soil.
Mapcode	Fishing area defined for catch and effort statistics
Marine Park	Means an area established as a marine park under Part 3 Division 1 of the *Marine Parks Act 2007*.
Marine protected area (MPA)	An area of land and/or sea especially dedicated to the protection and maintenance of biological diversity and of natural resources, and managed through legal or other effective means.
Mean High Water Springs	The line representing the average of all high water observations at the time of spring tide over a period of 19 years.
Organic enrichment	The supply of organic material (eg waste feed, faeces) to the seafloor.
Population	A group of individuals of the same species, forming a breeding unit and sharing a habitat.
Spatial	Of or relating to space.
Stakeholder	An individual or a group with an interest in the conservation, management and use of a resource.
Stock	A group of individuals of a species occupying a well defined spatial range independent of other groups of the same species, which can be regarded as an entity for management or assessment purposes.
Supplementary fed	Supplementary feeding is the giving of feed to aquatic organisms to supplement any naturally available food.

APPENDIX B – LIST OF ACRONYMS

AAC	Aquaculture Advisory Committee
CRC	Cooperative Research Centre
DAC	Development Assessment Commission
DEWNR	South Australian Department of Environment and Natural Resources
DPTI	Department for Planning, Transport and Infrastructure
EMP	Environmental Monitoring Program
EPA	Environment Protection Authority
EPBC Act	The Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*
ERDC	Environment, Resources and Development Committee
ESD	Ecological Sustainable Development
FTE	Full Time Equivalent
ILUA	Indigenous Land Use Agreement
LGA	Local Government Association
MHWS	Mean High Water Springs
MPA	Marine Protected Area
NPW Act	*National Parks and Wildlife Act 1972*
NRM	Natural Resource Management
PIRSA	Department of Primary Industries and Regions South Australia
SARDI	South Australian Research and Development Institute
SATC	South Australian Tourism Commission
The Minister	Minister for Agriculture, Food and Fisheries

APPENDIX C – MAPS AND COORDINATES

A written description of the Franklin Harbor aquaculture zone and the Franklin Harbor aquaculture exclusion zone is provided in the draft Aquaculture (Zones – Franklin Harbor) Policy 2015.

Aquaculture (Zones – Franklin Harbor) Policy 2015

The Franklin Harbor (inner) aquaculture sector comprises the area described in Schedule 1

The Franklin Harbor (outer) aquaculture sector comprises the area described in Schedule 2

The Franklin Harbor aquaculture exclusion zone comprises the area described in Schedule 3

Unless otherwise mentioned, all lines are geodesics based on the Geocentric Datum of Australia 1994 (GDA94) as defined in the Commonwealth of Australia Gazette GN35 of 6 September 1995. All co-ordinates are expressed in terms of GDA94. The map is provided for convenience of reference only. If a discrepancy occurs between the written text and the map, then the written text shall take precedence.

SCHEDULE 1

Franklin Harbor (inner) Aquaculture Sector

the Franklin Harbor (inner) aquaculture sector, comprising the State waters contained within and bounded by—

(a) a line commencing at 33°41'29" South, 136°56'15" East (Point 39), then south-easterly to 33° 42' 24" South, 136° 57' 12" East (Point 38), then south-easterly to 33° 42' 50" South, 136° 57' 26" East (Point 47), then south-westerly to a location on the line 1000 metres seaward of National Park boundary (Franklin Harbor Conservation Park) closest to 33° 43' 02.73" South, 136° 57' 23.17" East (Point 51), then beginning south-westerly following the line 1000 metres seaward of National Park boundary to the location closest to 33° 44' 06.40" South, 136° 54' 38.37" East (Point 5), then south-easterly to 33° 44' 10" South, 136° 54' 46" East (Point 6), then south-easterly to 33° 44' 26" South, 136° 55' 07" East (Point 7), then south-easterly to 33° 44' 42" South, 136° 55' 20" East (Point 8), then south-easterly to 33° 44' 59" South, 136° 55' 25" East (Point 9), then south-westerly to 33° 45' 16" South, 136° 55' 19" East (Point 10), then south-westerly to 33° 45' 19" South, 136° 55' 14" East (Point 11), then south-westerly to 33° 45' 21" South, 136° 55' 03" East (Point 12), then south-westerly to 33° 45' 22" South, 136° 54' 54" East (Point 13), then westerly to 33° 45' 22" South, 136° 54' 40" East (Point 14), then south-easterly to 33° 45' 35" South, 136° 54' 43" East (Point 15), then south-westerly to 33° 45' 47" South, 136° 54' 35" East (Point 16), then south-westerly to 33° 46' 03" South, 136° 54' 15" East (Point 17), then south-westerly to 33° 46' 10" South, 136° 53' 58" East (Point 18), then westerly to 33° 46' 11" S" South, 136° 53' 32" East (Point 19), then north-westerly to 33° 46' 10" South, 136° 53' 22" East (Point 20), then north-westerly to 33° 45' 53" South, 136° 52' 53" East (Point 21), then northerly to 33° 45' 28" South, 136° 52' 53" East (Point 22), then easterly to 33° 45' 28" South, 136° 54' 11" East (Point 23), then northerly to 33° 44' 34" South, 136° 54' 11" East (Point 24), then westerly to a location on the line 100 metres seaward of Mean High Water Springs to the location closest to 33° 44' 34" South, 136° 52' 13.66" East (Point 25), then beginning north-westerly following the line 100 metres seaward of Mean High Water Springs to the location closest to 33° 41' 43.87" South, 136° 55' 43.50" East (Point 26), then north-easterly

to 33° 41' 20" South, 136° 56' 00" East (Point 27), then easterly to 33° 41' 20" South, 136° 56' 05" East (Point 28), then south-westerly to 33° 41' 58" South, 136° 55' 59" East (Point 29), then south-westerly to 33° 42' 22" South, 136° 55' 47" East (Point 50), then south-westerly to 33° 43' 45" South, 136° 54' 15" East (Point 30), then south-westerly to 33° 43' 54" South, 136° 53' 44" East (Point 31), then south-westerly to 33° 44' 11" South, 136° 53' 17" East (Point 49), then south-easterly to 33° 44' 16" South, 136° 53' 23" East (Point 32), then north-easterly to 33° 44' 00.14" South, 136° 53' 46.33" East (Point 48), then north-easterly to 33° 43' 55" South, 136° 54' 31" East (Point 33), then north-easterly to 33° 42' 27" South, 136° 56' 09" East (Point 34), then north-easterly to the point of commencement, but excluding any land or waters so encompassed that lie landward of the line of Mean High Water Springs; and

(b) a line commencing at Mean High Water Springs closest to 33°40'36.48" South, 136°56'27.95" East (Point 35), then beginning north-easterly following the line of Mean High Water Springs to the
location closest to 33°41'45.87" South, 136°57'54.90" East (Point 36), then south-westerly to a location on the line 1000 metres seaward of National Park boundary (Franklin Harbor Conservation Park) closest to 33° 42' 02.18" South, 136° 57' 47.51" East (Point 37), then beginning south-westerly following the line 1000 metres seaward of National Park boundary to the location closest to 33° 42' 47.50" South, 136° 57' 34.29" East (Point 4), then north-westerly to 33°42'13" South, 136°57'19" East (Point 3), then north-westerly to 33°41'20" South, 136°56'17" East (Point 2), then north-easterly to 33°40'51" South, 136°56'19" East (Point 1), then north-easterly to the point of commencement, but excluding any land or waters so encompassed that lie landward of the line of Mean High Water Springs.

SCHEDULE 2

Franklin Harbor (Outer) Aquaculture Sector

The Franklin Harbor (outer) aquaculture sector comprises the State waters contained within and bounded by a line commencing at 33°43'45" South, 136°59'17" East (Point 40), then easterly to 33°43'45" South, 136°59'30" East (Point 41), then southerly to 33°44'02" South, 136°59'30" East (Point 42), then westerly to 33°44'02" South, 136°59'17" East (Point 43), then northerly to the point of commencement, but excluding any land or waters so encompassed that lie landward of the line of Mean High Water Springs.

SCHEDULE 3

Franklin Harbor aquaculture exclusion zone

The Franklin Harbor aquaculture exclusion zone comprises the State waters contained within and bounded by a line commencing at Mean High Water Springs closest to 33°40'36.48" South, 136°56'27.95" East (Point 35), then beginning north-easterly following the line of Mean High Water Springs to the location closest to 33°43'34.05" South, 136°59'25.23" East (Point 44), then south-

westerly to a location on the line 1000 metres seaward of National Park boundary (Franklin Harbor Conservation Park) closest to 33° 44' 09.71" South, 136° 58' 36.51.51" East (Point 45), then beginning south-easterly following the line 1000 metres seaward of National Park boundary to the line of Mean High Water Springs closest to 33°48'00.17" South, 136°50'32.90" East (Point 46), then beginning south-easterly following the line of Mean High Water Springs to the point of commencement, but excluding any land or waters so encompassed that lie landward of the line of Mean High Water Springs.

but excluding

- the *Franklin Harbor (inner) aquaculture sector*

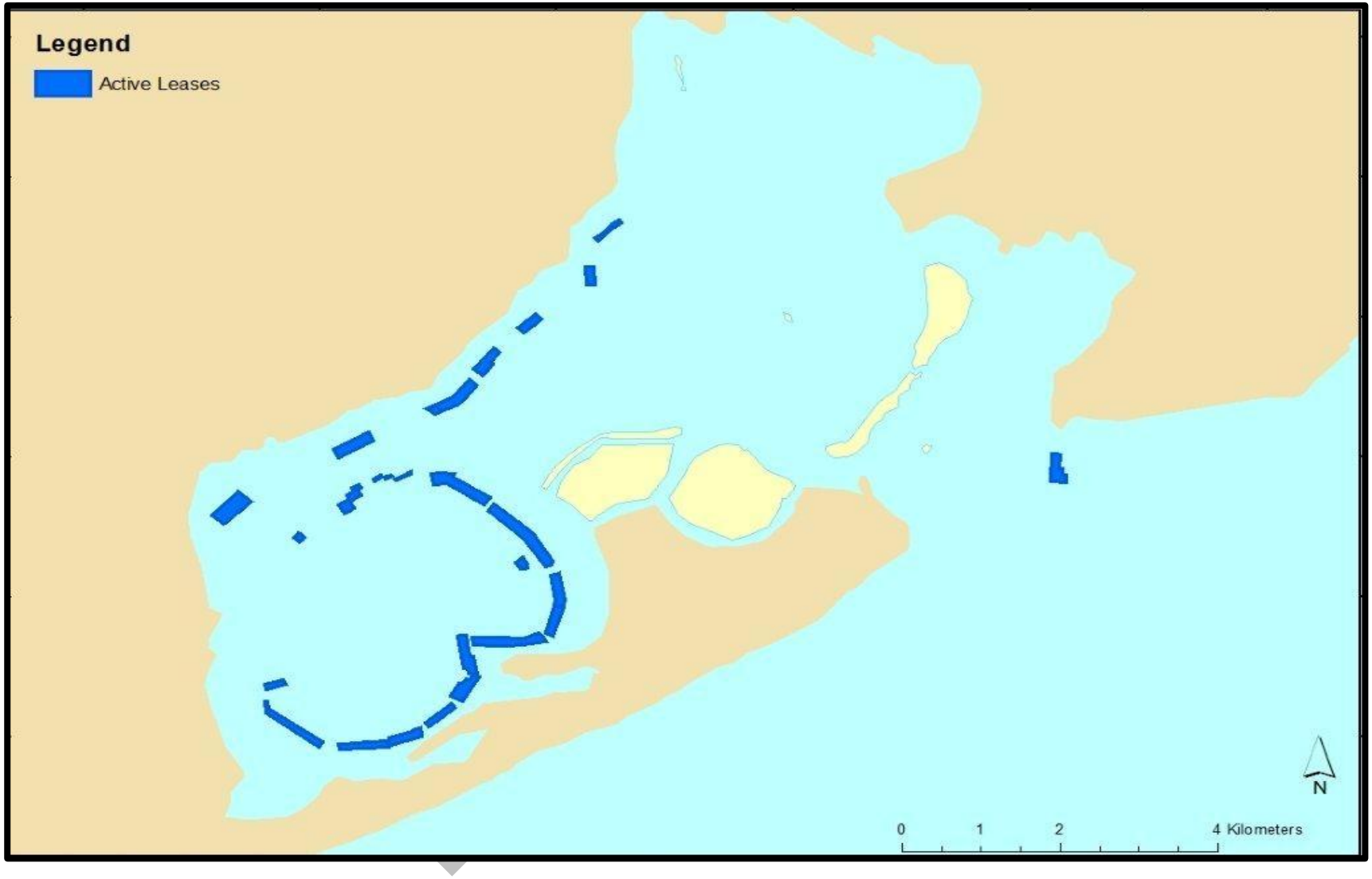

Figure 1: Map of the current aquaculture lease locations within the Franklin Harbor area (lease information correct as at February 2015)

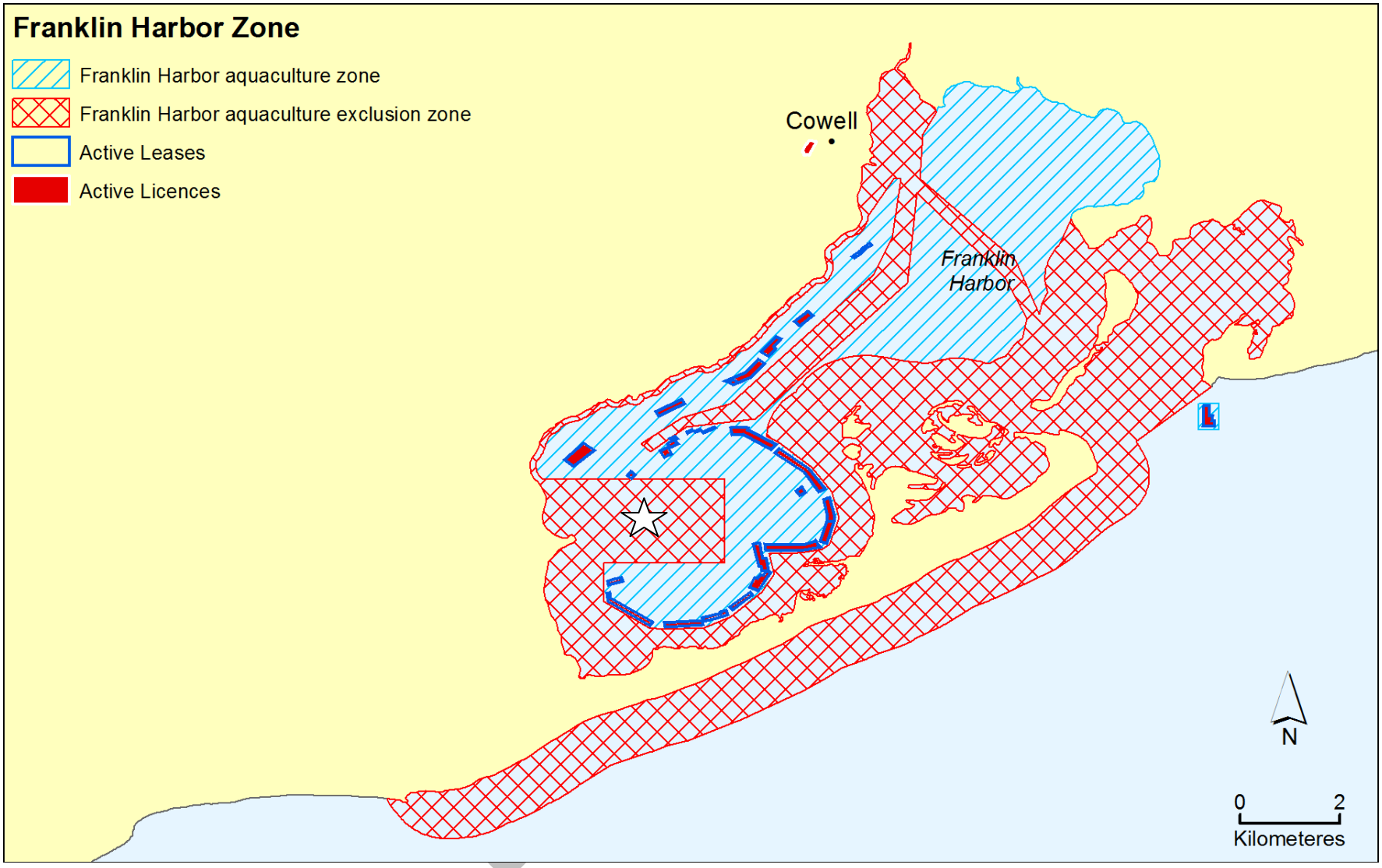

Figure 2. Map of the location of the proposed Franklin Harbor exclusion zone. The ☆ shape signifies an area deemed by lease and licence holders to be the origin of important source nutrients for oysters grown in the zone.

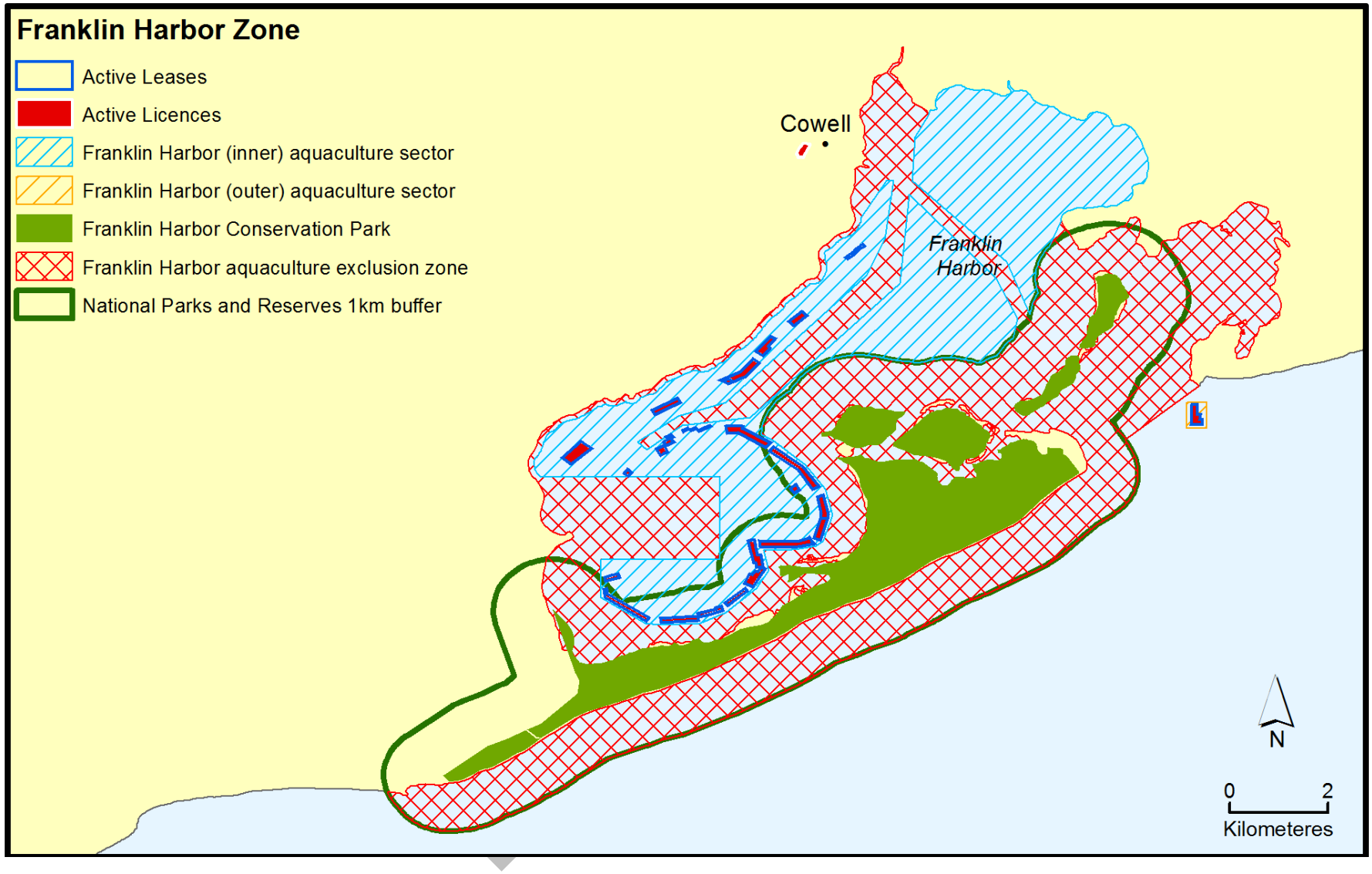

Figure 3: Map showing the Franklin Harbor aquaculture zone comprised of the Franklin Harbor (Inner) aquaculture sector and Franklin Harbor (Outer) aquaculture sector as well as the National Parks and Reserve Buffer.

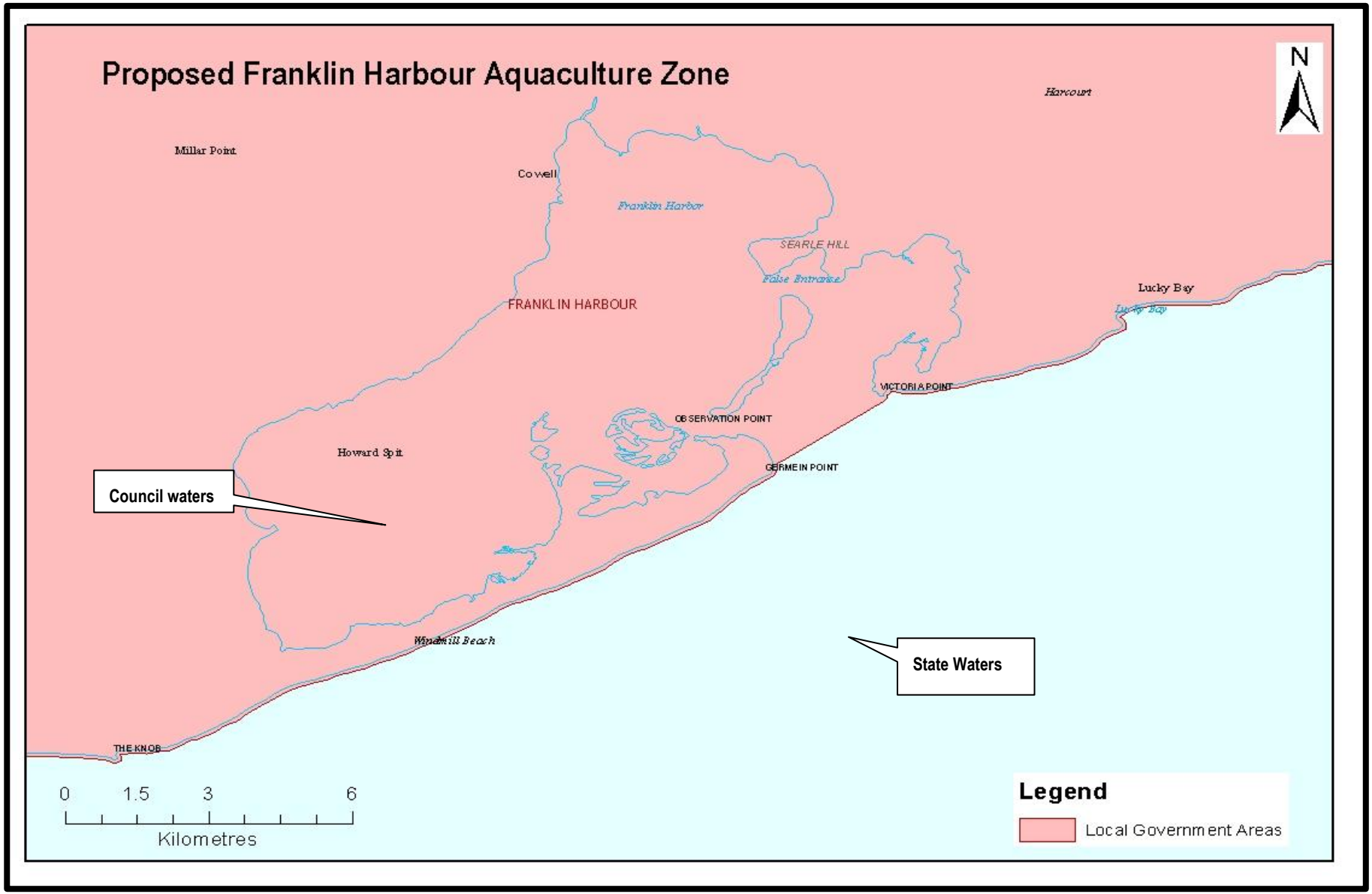

Figure 4: Map illustrating the current boundary between local council and state development approval authority for Franklin Harbor.

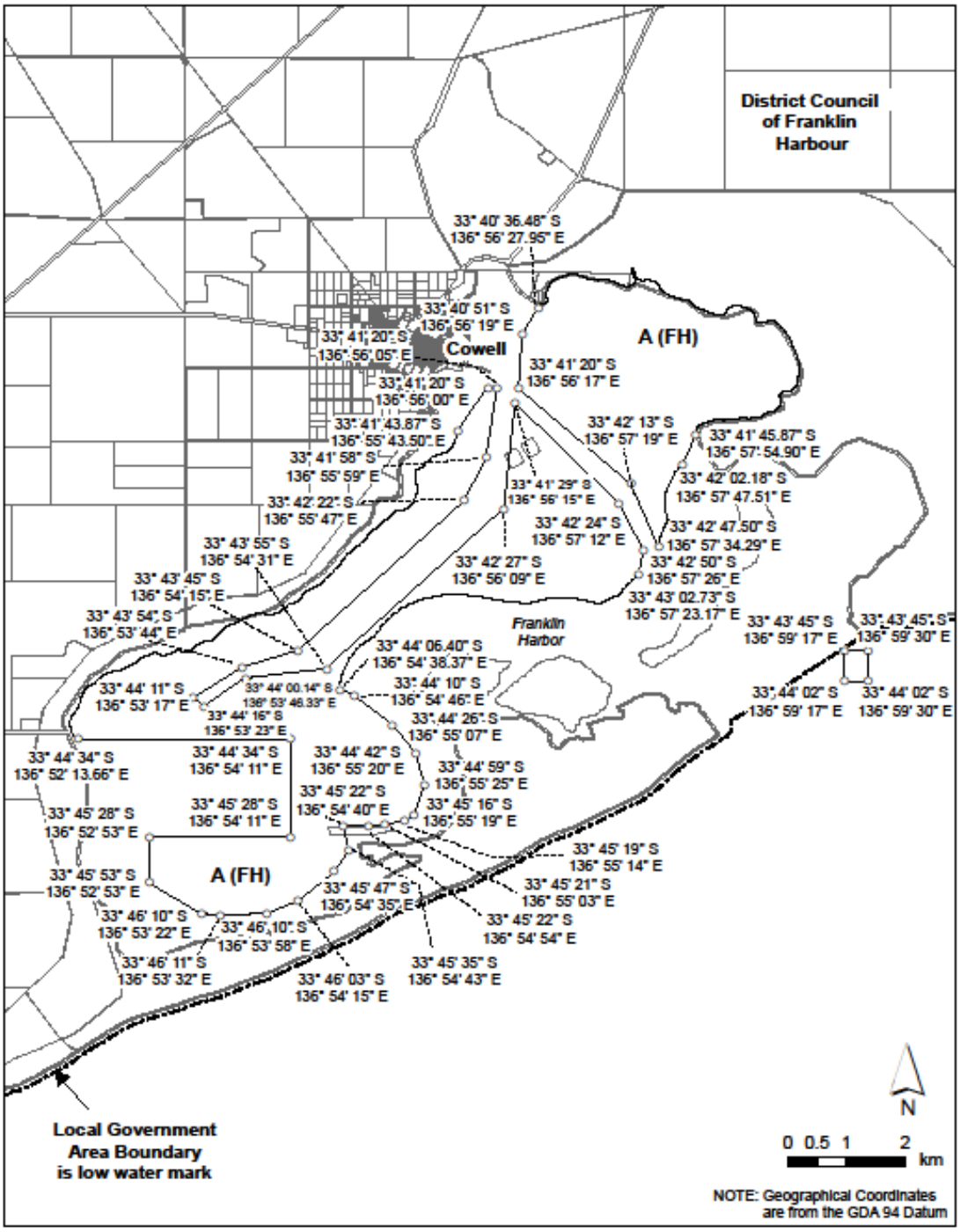

Figure 5: Proposed amendments to the Land Not Within a Council Boundary (Coastal Waters) Development Plan

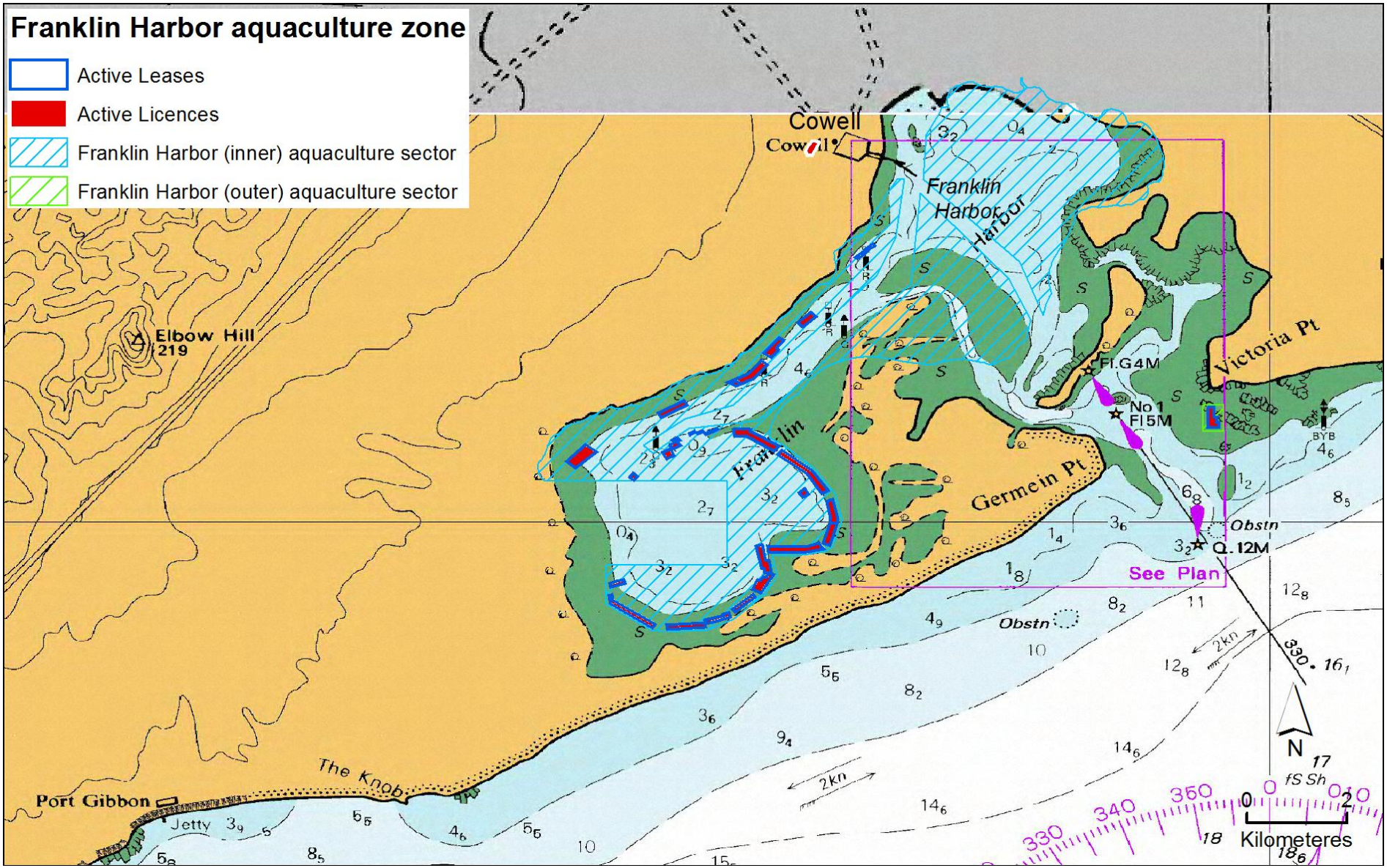

Figure 6: Map illustrating water depth (in metres) in the proposed Franklin Harbor zone and the exclusion zone.

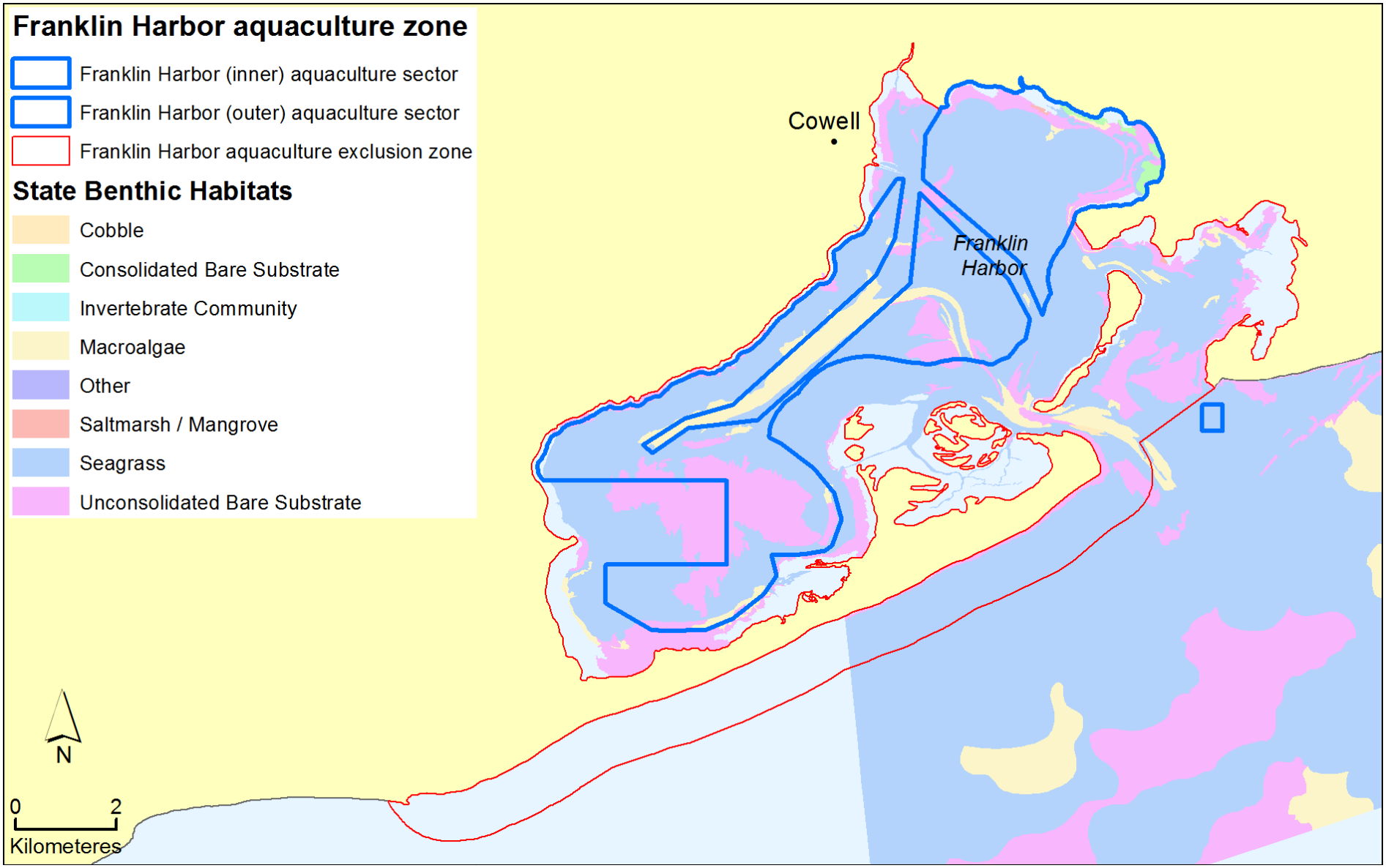

Figure 7: Map illustrating benthic habitats within the proposed Franklin Harbor zone and exclusion zone.

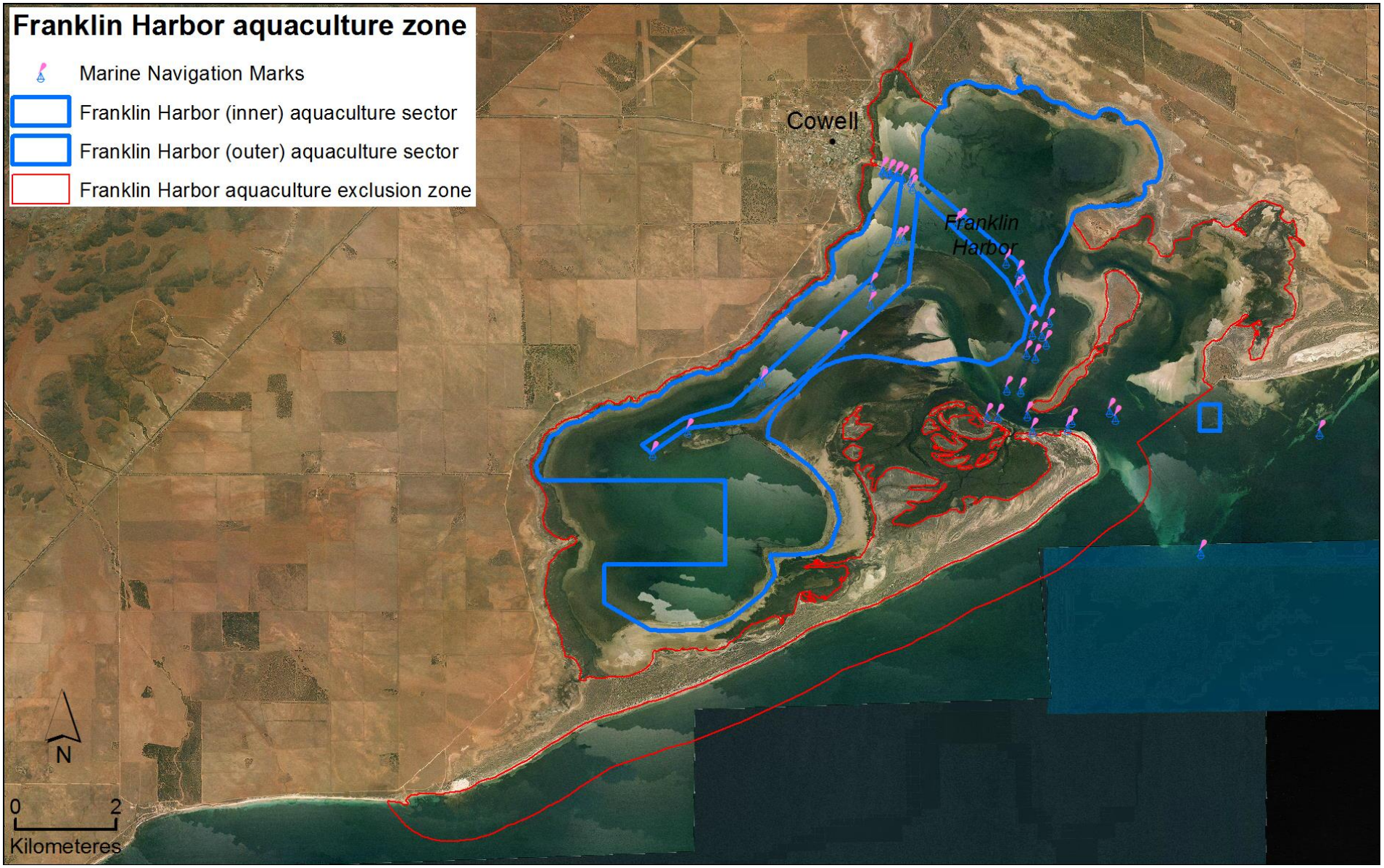

Figure 8: Satellite image illustrating the benthic habitat of the proposed Franklin Harbor zone area.

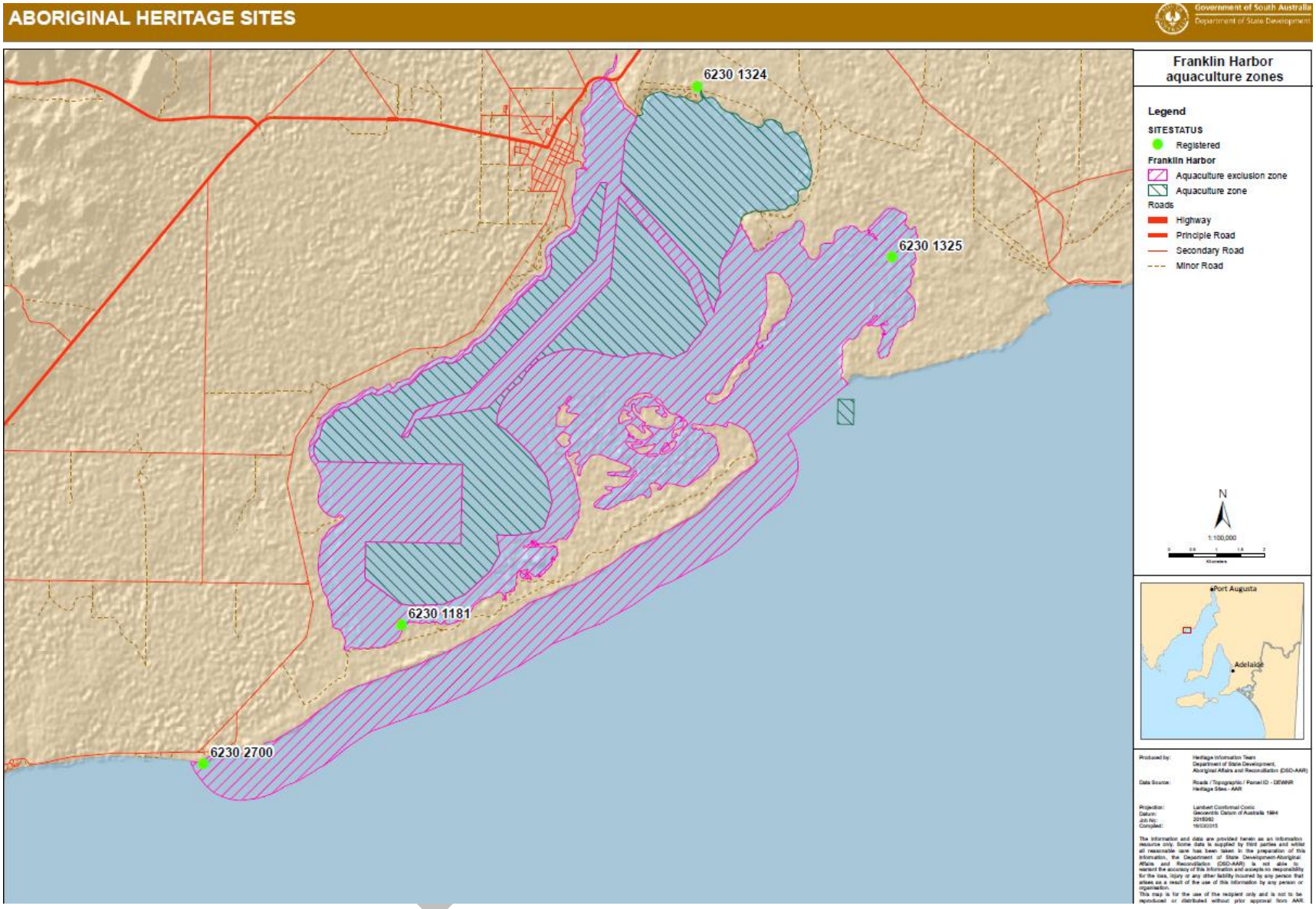

Figure 9: Map showing Aboriginal sites in the Franklin Harbor area.

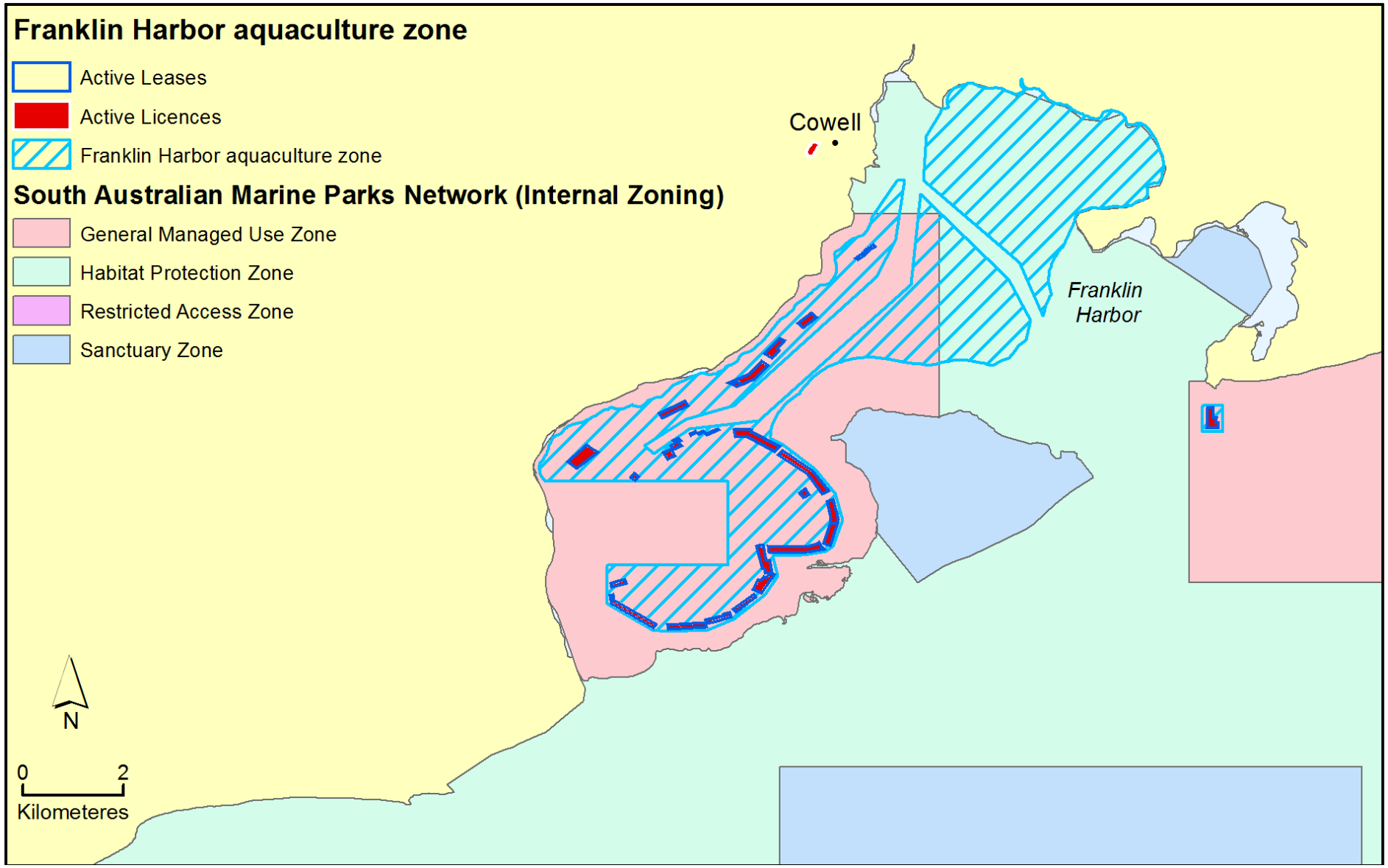

Figure 10: Composition and location of the Franklin Harbor Marine Park and the Proposed Franklin Harbor Zone.

APPENDIX D1 – BACKGROUND INFORMATION

Legislation / Policy	Objectives	Consistency
South Australia's Strategic Plan	The 2011 version of the South Australia's Strategic Plan is a commitment to the three organising priorities and foundations of a sustainable society: our community, our prosperity, and our environment. Each priority is organised into visions and goals, while targets are those that are specific and measurable and align top priorities visions and goals to specific objectives. The Plan is built on the following strategic priorities: 1. Creating a vibrant city 2. Safe communities, healthy neighbourhoods 3. An affordable place to live 4. Every chance for every child 5. Growing advanced manufacturing 6. Realising the benefits of the mining boom for all 7. Premium food and wine from our clean environment.	Aquaculture policies under *the Aquaculture Act 2001* provide the necessary policy framework to facilitate aquaculture development in South Australia. The new and developing aquaculture industry is greatly assisting economic development and helps support the State Government Priorities in seeking to obtain premium food and wine from a clean environment. Aquaculture policies also help meet these strategic plan targets: • Target 35 – Economic Growth • Target 37 – Total Exports • Target 38 – Business Investment • Target 47 – Jobs
Planning Strategy for Regional South Australia (January 2003 – amended Dec 2007) (DPLG document)	The Planning Strategy for Regional South Australia (January 2003, as amended December 2007) contains a number of strategies to support future growth in regional South Australia. • Building and/or supporting sustainable communities; • Being more efficient and sustainable; • Diversifying primary production into new areas to replace or complement existing activities; • Adding value by greater processing of produce within South Australia instead of exporting produce in its raw state; • Facilitating sustainable tourism development to achieve economic, social and environmental benefits for the state; and • Integrated and sustainable management of natural resources in a manner that maintains ecological processes.	The Policy is consistent with the strategies relating to the diversifying primary production into new areas to replace or complement existing activities and the integrated and sustainable management of natural resources in a manner that maintains ecological processes.

Development Act 1993 *Development Regulations 2008* Land Not Within A Council Area (Coastal Waters) Development Plan	The *Development Act 1993* and *Development Regulations (2008)* detail the processes for making and assessing development applications. 'Development' is defined in the *Development Act 1993* to include: • A change in the use of land or buildings • The creation of new allotments through land division (including Strata and Community Title division) • Building work (including construction, demolition, alteration and associated excavation/fill) • Cutting, damaging or felling of significant trees • Specific work in relation to State and local heritage places • Prescribed mining operations • Other acts or activities in relation to land as declared by the Development Regulations. The *Development Act 1993* requires there be a Development Plan for each part of the state. Development Plans guide development and inform assessment of development applications. Development Plans contain the zones, maps and written rules ('policies') which guide applicants as to what can and cannot be done in the future on any piece of land in the area covered by the Development Plan. These zones, maps and policies provide the detailed criteria against which development applications will be assessed. The policies and zoning in Development Plans need to be changed and updated over time. The *Development Act 1993* provides the legislative framework for undertaking amendments to a Development Plan. Amendments can be instigated by either the relevant Council or the Minister for Urban Development and Planning. The document used to propose changes to a Development Plan is called a Development Plan Amendment (DPA). The *Development Regulations (2008)* recognise aquaculture zones identified in an aquaculture policy prepared under the *Aquaculture Act 2001*, classing them as a Category 1 development. The Act and Regulations also enable the Minister for Urban Development and Planning to amend a development plan in accordance with an approved aquaculture policy under the *Aquaculture Act 2001*.	This Policy is consistent with these provisions in that it seeks to ensure the ecologically sustainable development of the marine-based aquaculture industry and recognises and respects other users of the marine resource.

	Recent amendments to the *Development Act 1993* mean that aquaculture is not "development" under that Act if it is located within an aquaculture zone and within the LNWCA(Coastal Waters) Development Plan. Aquaculture within the designated aquaculture zone will not be subject to development assessment. However, aquaculture proposed outside of this zone will remain subject to full development assessment. More information on the Land Not Within a Council Area (Coastal Waters) Development Plan can be sourced by contacting the Department of Planning and Local Government on 08 8303 0600.	
Aboriginal Heritage Act 1988	The *Aboriginal Heritage Act 1988* provides for the protection and preservation of Aboriginal sites, objects and remains, whether registered or not, without an authorisation from the Minister for Aboriginal Affairs and Reconciliation pursuant to section 23. Section 20 of this Act requires that any Aboriginal sites, objects or remains discovered on land, be reported to the Minister for Aboriginal Affairs and Reconciliation. The *Native Title Act 1993* (Cth) provides for the recognition by Australian law that some Indigenous people have rights and interests that come from their traditional laws and customs (National Native Title Tribunal (NNTT) 2009). In particular, the *Native Title Act 1993* may validate past acts; provide for future acts; extinguish native title either in full or part; provide a process to determine native title; provides three approaches to negotiating native title, including Indigenous Land Use Agreements (ILUA); and, provides for a range of other matters including the establishment of a land trust and the National Native Title Tribunal. Resolution of native title claims by either consent determination or by recognition of an ILUA is a key focus in South Australia and is a key target in South Australia's Strategic Plan. Specifically, target 3.15 of the Strategic Plan aims to resolve 75% of native title claims in South Australia by 2014.	The Native Title Unit of the Attorney General's Department are consulted during the development of aquaculture policies to establish if there are any registered ILUA's in the area or if there are any in negotiation that need to be considered. Additionally, advice is sought from the Native Title Unit to determine who are the appropriate Native Title Groups to consult during the development of the policy. As part of the individual lease application process (within and outside of aquaculture zones) details of the application are referred to the Aboriginal Legal Rights Movement and the appropriate Claimant groups pursuant to section 24HA of the *Native Title Act 1993* (Cwth).
Australia's Ocean Policy (Cth)	Australia's Oceans Policy sets in place a framework for integrated and ecosystem-based planning and management for Australia's marine jurisdictions. It promotes ecologically sustainable development of the ocean resources and encourages internationally competitive marine industries, whilst ensuring the protection of marine biological diversity. The key tool is Regional Marine Planning i.e., planning based on large areas that are ecologically similar, and seeks to integrate the use, management and conservation of marine resources at the ecosystem level.	This policy is consistent with the Australia's Ocean Policy as it seeks to avoid aquaculture development over unique and sensitive ecosystems, and provides for orderly, sustainable and internationally competitive marine industries.

	Marine Plans establish an overarching strategic planning framework to guide State and local government planners and natural resource managers in the development and use of the marine environment. Fundamental to these Marine Plans is an ecologically based zoning model. Each of these zones is supported by goals and objectives.	
Marine Parks Act 2007	The *Marine Parks Act 2007* provides the legislative framework for the dedication, zoning and management of South Australia's marine parks. South Australia's marine parks will be zoned for multiple-use to protect coastal, estuarine and marine ecosystems, while also providing for continued ecologically sustainable use of suitable areas. This means that most activities, including aquaculture operations, will still be allowed within a marine park. However, some activities will not be permitted in either Restricted Access Zones or Sanctuary Zones in order to provide the necessary level of protection for marine biodiversity and habitats. Both of these zones preclude commercial fishing, recreational fishing and aquaculture operations.	It is widely recognised that Aquaculture is an important and growing industry in this State that provides significant benefits to South Australia. The needs of the industry have been considered with commitments to accommodate, as far as possible, existing aquaculture operations. This has resulted in whole-of-government policy commitments and a draft Memorandum of Administrative Agreement between PIRSA and the Department of Environment and Natural Resources. Together these support the relationship and likely interactions between proposed marine parks and aquaculture developments in South Australian waters and enable DEWNR and PIRSA to work together to address key targets from South Australia's Strategic Plan. These include increasing the value of South Australia's export income by $25 billion by 2020 (Target 37) and maintaining the health and diversity of South Australia's unique marine environments (Target 71) and such that each is given optimal effect without detriment to the other. The Policy has been prepared having regard to Marine Park objects and boundaries and in accordance with the agreement between DEWNR and PIRSA.
Natural Resources Management Act 2004 Eyre Peninsula	The intent of the *Natural Resources Management Act 2004* is to establish an integrated system of natural resource management that will assist in achieving sustainable natural resource management in South Australia. Regional Natural Resources Management Plans are underpinned by ecologically sustainable development principles and are required to recognise best practice by an industry sector.	The *Aquaculture Act 2001* and its supporting policies are also underpinned by ecologically sustainable development principles.

Natural Resources Management Plan		The Policy lies within the Eyre Peninsula Natural Resources Management Board. The Policy must take into consideration issues raised within the Eyre Peninsula Natural Resources Management Plan (NRM Plan). As the proposed aquaculture zone relates only to marine aquaculture there are no matters of water allocation, groundwater or surface water, specific to the aquaculture zone. The policy is consistent with the Eyre Peninsula NRM Plan.
Environment Protection Act 1993 *Environment Protection (Water Quality) Policy 2003*	The Objects of the *Environment Protection Act 1993* (EP Act) include the promotion of the principles of ecologically sustainable development, and in particular, to prevent, reduce, minimise and, where practicable, eliminate harm to the environment. The EP Act provides that communities must be able to provide for their economic, social and physical wellbeing. The principle object of the *Environment Protection (Water Quality) Policy 2003* (Water Quality Policy) established under the EP Act is to achieve the sustainable management of waters by protecting or enhancing water quality while allowing economic and social development. In particular, the Policy requires all reasonable and practicable measures to be taken to avoid the discharge or deposit of waste into any waters or onto a place from which it is reasonably likely that waste will enter any waters. The Policy prescribes water quality criteria that must not be contravened and prohibits the discharge or deposition of pollutants into any waters that results in: • Loss of sea grass or other native aquatic vegetation; or • Reduction in numbers of any native species of aquatic animal or insect; or • Increase in numbers of any non-native species of aquatic animals or insect; or • Reduction in numbers of aquatic organisms necessary to a healthy aquatic ecosystem; or • Increase in algal or aquatic plant growth; or • Water becoming toxic to vegetation on land; or • Water becoming harmful or offensive to humans, livestock or native animals; or • Increased turbidity or sediment levels.	This Policy is consistent with the provisions of the EP Act 1993 and the Water Quality Policy as it seeks to minimise or prevent harm to the environment associated with aquaculture.

Harbors and Navigation Act 1993	The *Harbors and Navigation Act 1993* sets out the following objectives; • To provide for the efficient and effective administration and management of South Australian harbors and harbor facilities for the purpose of maximising their use and promoting trade; and • To ensure that efficient and reliable cargo transfer facilities are established and maintained; and • To promote the safe, orderly and efficient movement of shipping within harbors; and • To promote the economic use and the proper commercial exploitation of harbors and harbor facilities; and • To provide for the safe navigation of vessels in South Australian waters; and • To provide for the safe use of South Australian waters for recreational and other aquatic activities; and • In so far as this Act applies to a marine park, to further the objects of the *Marine Parks Act 2007.*	Under the *Aquaculture Act 2001*, aquaculture policies can be prescribed in State waters. These policies define areas of state waters that are considered appropriate for aquaculture, and have regard to other resource users; including operators of recreational and commercial vessels. Section 20 of the *Aquaculture Act 2001* provides that the grant of aquaculture leases is subject to the concurrence of the Minister responsible for administration of the *Harbors and Navigation Act 1993.*
Coast Protection Act 1972	The *Coast Protection Act 1972* establishes the Coast Protection Board. The functions of the Board are: • To protect the coast from erosion, damage, deterioration, pollution and misuse; • To restore any part of the coast that has been subjected to erosion, damage, deterioration, pollution or misuse; • To develop any part of the coast for the purpose of aesthetic improvement, or for the purpose of rendering that part of the coast more appropriate for the use or enjoyment of those who may resort thereto; • To manage, maintain and, where appropriate, develop and improve coast facilities that are vested in, or are under the care, control and management of the Board; • To report to the Minister upon any matters that the Minister may refer to the Board for advice; • To carry out research, to cause research to be carried out, or to contribute towards research, into matters relating to the protection, restoration or development of the coast; and • To perform such other functions assigned to the Board by or under this or any other Act.	The Policy is consistent with the provisions of the *Coast Protection Act 1972* as it seeks to protect the coast by minimising any risk of erosion, damage, deterioration, pollution and misuse of the resource, through appropriate siting of aquaculture zones and aquaculture exclusion zones, the specification of appropriate types and levels of aquaculture development.
Native Vegetation Act 1991	The objects of the *Native Vegetation Act 1991* are: • The conservation, protection and enhancement of the native vegetation of the State and, in particular, remnant native vegetation, in order to prevent further -	The Policy is consistent with these objectives as it seeks to minimise impacts on native vegetation through appropriate siting of aquaculture zones and the establishment of aquaculture

	• Reduction of biological diversity and degradation of the land and its soil; and • Loss of quantity and quality of native vegetation in the State; and • Loss of critical habitat; and • The provision of incentives and assistance to landowners to encourage the commonly held desire of landowners to preserve, enhance and properly manage the native vegetation on their land; and • The limitation of the clearance of native vegetation to clearance in particular circumstances including circumstances in which the clearance will facilitate the management of other native vegetation or will facilitate the sustainable use of land for primary production; and • The encouragement of research into the preservation, enhancement and management of native vegetation; and • The encouragement of the re-establishment of native vegetation in those parts of the State where native vegetation has been cleared or degraded.	exclusion zones around sensitive habitats.
Historic Shipwrecks Act 1976 (Cth) *Historic Shipwrecks Act 1981* (SA)	Any shipwreck or relic that is older than 75 years is protected under the *Historic Shipwrecks Act 1976* (Cth), which covers water off the South Australian coast from the low water mark or the agreed baselines but does not include State internal waters – ie the River Murray, Gulf St. Vincent, Spencer Gulf, Encounter Bay, Lacepede Bay, Rivoli Bay and Anxious Bay – which are covered under the *Historic Shipwrecks Act 1981* (SA). If there are declared historic shipwrecks in the vicinity of aquaculture development, the developer is advised that a 550 metre radius buffer zone applies around the historic shipwreck, and that no aquaculture development should take place within this area. It should also be noted that while a shipwreck may not currently be protected, the 75 year rolling protections date means that it will be at some future time.	The Policy is consistent with these requirements and provides for a greater distance from historic shipwrecks of 550 metres which is requirement of the Land Not Within A Council Area (Coastal Waters) Development Plan under the *Development Act 1993*.
National Parks and Wildlife Act 1972	An Act to provide for the establishment and management of reserves for public benefit and enjoyment; to provide for the conservation of wildlife in a natural environment; and for other purposes.	
Fisheries Management Act	An Act to provide for the conservation and management of the aquatic resources of the State, the management of fisheries and aquatic reserves, the regulation of fishing and the processing of aquatic resources, the protection of aquatic habitats, aquatic mammals and aquatic resources and the control of	To minimise adverse interactions with seabirds and large marine vertebrates, section 19 of the *Aquaculture Regulations 2005* requires a licensee to have a written interaction strategy

2007	exotic aquatic organisms and disease in aquatic resources; to repeal the *Fisheries Act 1982* and the *Fisheries (Gulf St. Vincent Prawn Fishery Rationalisation) Act 1987*; to make related amendments to other Acts; and for other purposes.	approved by the Minister. In addition, risks posed by the aquaculture activity are assessed at the time of licence application through the ESD Assessment process, consistent with the National ESD Framework (Fletcher *et. al.*, 2004).

APPENDIX D2 – AQUACULTURE ZONING FRAMEWORK

The Policy defines the broad framework for aquaculture management within the defined zones, including the prescribed criteria that apply to each zone/sector. More detailed considerations such as the size of each lease, the farming structures permitted on each licence and the stocking densities for different species is assessed and managed at the individual lease and licence level. Such management tools do not form part of the zoning policy.

Approval of leases and licenses in aquaculture zones will be subject to the provisions of the *Aquaculture Act 2001* and the *Aquaculture Regulations 2005*, and relevant lease and licence conditions. An assessment of individual site suitability (including an Environmental Sustainability Development Assessment) and criteria outlined in the Aquaculture Tenure Allocation Policy are considered during the assessment. Ongoing environmental monitoring provides information that is an important input to the adaptive management of aquaculture. Further information about licensing is provided in part D4 and D5 of this Appendix.

Carrying Capacity and Assimilative Capacity

The concepts of 'carrying capacity' and 'assimilative capacity' are important and interrelated tools for natural resource management. Carrying capacity equates to the biomass (tonnage) of culture product that can be added to the environment at a rate that can be assimilated by the environment without significant environmental changes. Assimilative capacity refers to the extent to which the environment can cope with a particular activity without unacceptable change (O'Bryen and Lee, 2003).

Estimating carrying and assimilative capacities for finfish aquaculture is a relatively simpler task than for shellfish or algae. This is largely due to the additive versus extractive nature of finfish production compared to shellfish or algae production. For finfish aquaculture, it is possible to determine, using mass balance equations of the type described by Beveridge (1987), the changes in concentration of nitrate and ammonia in the water column. The level of confidence in these estimations reflects the empirical understanding of sources and sinks for these waste products and their interaction.

Due to physical and chemical differences in site characteristics among coastal areas where aquaculture occurs, such as water depth and ambient nutrient concentrations, it is necessary to determine carrying and assimilative capacities for each different area (Tanner *et. al.*, 2007). Furthermore, it is necessary to have an understanding of the species' metabolism, used for calculations of aquaculture system oxygen requirements, fish energy requirements, environmental impact assessment, and species-specific physiological thresholds (Fitzgibbon, 2007). This data exists for Yellowtail Kingfish and mulloway cultured in SA (Clark and Seymour, 2007; Fitzgibbon *et. al.*, 2007), but the necessary research has not been carried out for other cultured species. Where new research is published, PIRSA Fisheries and Aquaculture will incorporate this new knowledge into their assessment and calculations.

For shellfish or algae aquaculture, estimating carrying capacity is more complicated as potential production must be estimated from available nutrient and light resources. At present there are difficulties in confidently predicting potential production. Firstly, there is limited data to ascertain the availability of nutrient and light for shellfish or algae; and, secondly, processes such as shellfish filtration, excretion and respiration rates, algae nutrient uptake and photosynthetic rates and assimilation efficiencies need to be investigated within South Australian coastal conditions

and compared to seasonally varying food concentrations and temperature (Parsons Brinkerhoff and SARDI Aquatic Sciences, 2003; Mount *et. al.*, 2007). Nevertheless, algae aquaculture has been recommended as a means by which the negative effects of effluent may be minimised and the environmental impact of other aquaculture activities reduced (Chopin *et. al.*, 2001; Buschmann *et. al.*, 2007).

Class of aquaculture

Classes of aquaculture under previous aquaculture zone policies referred to groups of species e.g. bivalve molluscs; finfish; tuna etc. Under a modified format, classes of aquaculture now relate to the feeding requirements of aquatic organisms i.e. whether the organisms are supplementary fed or not supplementary fed. Grouping the classes of aquaculture around feed inputs better focuses the policy on the key determinant of environmental impact, namely, the amount of nutrient that is released into the environment. The modified format also provides greater flexibility to adaptively manage aquaculture activity through the conditions placed on individual licences.

The classes of aquaculture that may be permitted under policies are:

- the farming of prescribed wild-caught tuna;
- the farming of aquatic animals (other than prescribed wild-caught tuna) in a manner that involves regular feeding (e.g. finfish and abalone);
- the farming of bivalve molluscs (e.g. oysters, scallops, mussels, razorfish); and
- the farming of algae.

The first two of these involve the supplemental feeding of farmed animals, whereas no supplemental feeding is associated with the latter two classes. Only the suitable classes of aquaculture are incorporated into an aquaculture zone policy e.g. Aquaculture (Zones – Cape D'Estrees) Policy 2006 specifies the farming of molluscs (other than filter feeding molluscs) and algae only.

Biomass limits

Control of the amount of nutrients released into or extracted from the environment is achieved at the aquaculture zone policy level by setting upper biomass limits for each aquaculture zone i.e. the maximum biomass of organisms farmed under a particular class of aquaculture at any one time. Environmental impacts are also managed by monitoring impacts on an on-going basis, through the environmental monitoring and reporting requirements stipulated in the *Aquaculture Regulations 2005*.

The Policy sets biomass limits for the farming of supplementary fed aquatic animals in terms of a tonnage of finfish biomass equivalents. The net amount of nutrient released by various types of supplementally fed organisms differs, with finfish aquaculture generating the highest amount of discharge compared, for example, with abalone. Because there is still insufficient scientific information to accurately predict the amounts of nutrients that would be released by non-finfish species, this policy takes a generally cautious approach in setting biomass limits by assuming that amounts of nutrients released by all farmed organisms that are supplementally fed would be similar to that of finfish. However, in order to accommodate future use of information on nutrient release by non-finfish species, the proposed policy adopts the concept of finfish biomass equivalents, where upper biomass limits are expressed and benchmarked in terms of an amount of biomass that would have an environmental impact equivalent to a stated biomass of finfish.

The impacts of overstocking systems with aquatic organisms that do not involve supplemental feeding are likely to be felt by industry (through decreased production) well before any potential environmental harm. For example, in the case of filter feeders like oysters, production is self-limiting since industry performance overall will be determined by the amount of suitable food available in the water. As a result, the focus of PIRSA Fisheries and Aquaculture's regulatory activity for aquatic organisms (that do not involve supplemental feeding) is to meet the Government's undertaking "to maximise benefits to the community from the State's aquaculture resources" i.e. to ensure that an aquaculture zone is not overstocked to the ongoing detriment of licensees operating in the area.

The Policy allows for the Minister to alter the maximum biomass limits of all classes of aquaculture through notice in the South Australian Government Gazette. This provides a mechanism to enable flexibility in setting biomass limits for aquaculture zones/sectors and enables future research and environmental monitoring results to be taken into consideration as they become available over time.

In the case of bivalve molluscs, the Minister cannot increase the maximum biomass limit unless satisfied, after consultation with relevant aquaculture industry groups, that such an increase would not compromise the overall productivity of existing bivalve mollusc farming operations in the area.

APPENDIX D3 – PROTECTED SPECIES FRAMEWORK

The *National Parks and Wildlife Act 1972* (NPW Act) provides the legislative framework dealing with native fauna and flora in this State. Most native mammals, reptiles and birds are protected in South Australia. Under the provisions of the NPW Act, it is an offence to kill, hunt, catch, restrain, injure, molest or harass a protected animal. Rare, vulnerable and endangered species are listed in Schedules 7, 8 and 9 of the NPW Act.

The *Fisheries Management Act 2007* (FM Act) provides offence provisions for the taking, injuring or harming of an aquatic mammal or aquatic resource of a protected species. Under the provisions of section 71(1)(a) of the FM Act, a person must not kill, injure or molest, or cause or permit the killing, injuring or molestation of, a marine mammal. Furthermore, it is an offence to take protected species, which include white shark (*Carcharodon carcharias*), more commonly known as the great white shark. A statutory defence exists in cases where the defendant proves that the alleged offence was not committed intentionally and did not result from any failure on the part of the defendant to take reasonable care to avoid the commission of the offence.

All marine mammals and sharks have the potential to become entangled in nets or mooring lines and seabirds may be adversely affected by activity around any feeding, roosting or nesting sites in the area. To minimise adverse interactions with seabirds and large marine vertebrates section 19 of the *Aquaculture Regulations 2005* requires a licensee to have a written interaction strategy approved by the Minister. In addition, risks posed by the aquaculture activity are assessed at the time of licence application through the ESD Assessment process consistent with the National ESD Framework (Fletcher *et. al.*, 2004).

Syngnathid fish are protected under the provisions of section 71 of the *Fisheries Management Act 2007*. Syngnathid fish are likely to be present, especially in the seagrass, algal and reef assemblages.

Framework specific to finfish aquaculture

In November 2002 Cabinet approved the establishment of a Marine Mammal-Marine Protected Areas Working Group (MM-MPAWG) to develop management arrangements to address the proximity of aquaculture developments to core areas of proposed marine protected areas and significant marine wildlife habitats such as seal colonies and whale breeding areas.

The MM-MPAWG concluded that the only aquaculture activity to pose a risk to seal/sea lion colonies is finfish aquaculture, and the only seal/sea lion colonies at risk from finfish aquaculture are breeding colonies of Australian Sea-lions.

Although New Zealand Fur seals also interact with aquaculture operations, they were not considered to be at risk from finfish aquaculture, due to their increasing population and expansion in distribution around the coastline. As such it was proposed that no further management restrictions would apply in relation to the New Zealand Fur seals.

Cabinet considered the MM-MPAWG report and, in 2005, noted the following recommendations in order to reduce the potential risk to Australian Sea-lion colonies from finfish aquaculture—

- Finfish aquaculture located within 5 km of any Australian sea-lion haul-out sites will not be approved;

- Finfish aquaculture will not be approved within 15 km of the eight major Australian sea lions breeding colonies (namely The Pages, Dangerous Reef, Seal Bay, West Waldegrave Island, Olive Island, Franklin Islands, Purdie Island and Nicolas Baudin Island);
- Finfish aquaculture to be located between 5-15 km of minor Australian sea lion breeding colonies will have a risk assessment applied to during the licence assessment process specifically related to seals; and
- Over 15 km, there will be no restrictions in relation to finfish aquaculture.

APPENDIX D4 – LESSEE AND LICENSEE OBLIGATIONS

The *Aquaculture Act 2001* (the Act) is the main piece of legislation governing the management, control and development of the aquaculture sector. The Act includes provisions giving the Minister for Agriculture, Food and Fisheries the powers to grant aquaculture leases (with the concurrence of the Minister for Transport and Infrastructure) and licences and the power to make decisions on licence conditions, with the EPA's approval, as well as conditions and terms of leases.

The *Aquaculture Regulations 2005* establishes an environmental assessment, monitoring and management framework for all sectors of aquaculture.

The Act provides for an integrated licensing and tenure system and provides a flexible approach to the granting of rights to occupy State waters. Under the Act, a licence may not be granted for aquaculture in State waters unless the area is subject to a lease granted by the Minister. The Act allows for four types of lease, namely pilot, production and emergency leases.

Applications for leases within an aquaculture zone must be allocated through a process approved by the Aquaculture Tenure Allocation Board (ATAB). A public call is made inviting applicants to submit their proposal on the required application form. These applications are assessed by the ATAB who then make a recommendation to the Minister on which applications should proceed. Once the tenure has been provisionally granted, a licence assessment will be undertaken.

The competitive allocation process ensures a fair and efficient means of allocating the State's marine aquaculture resources.

Applications for pilot leases outside an aquaculture zone are not subject to a competitive allocation process; however the ATAB is notified of all pilot lease applications.

Management obligations are those requirements an aquaculture operator must undertake according to the *Aquaculture Act 2001* and other relevant legislation. Penalties for a failure to comply with the requirements include expiation fines and suspension or cancellation of the lease and/or licence.

Ecologically Sustainable Development

PIRSA Fisheries and Aquaculture's Ecologically Sustainable Development (ESD) risk assessment guidelines for aquaculture licenses is based on the National ESD Framework: The 'how to' Guide for Aquaculture (Fletcher *et. al.*, 2004), underpinned by the Australian and New Zealand Standard (AS/NZ) 4360:2004 (now superseded by AS/NZS ISO 31000:2009 (2009)) for risk management. The assessment process considers risks to aquatic habitats associated from individual aquaculture facilities (both marine and land-based) through to accumulative risks of the industry at the regional scale. Using these guidelines, aquaculture licence applications are assessed to determine the likely environmental, social and economic risks the proposed licence may have if approved.

The environmental risk assessment component considers the nature of the specific activity relative to the environment in which it will be undertaken at different spatial scales, namely; at the level of the individual site and at the regional level. Risks are calculated semi-quantitatively using a likelihood-by-consequence methodology. PIRSA Fisheries and Aquaculture's management of ESD risks can result in the amendment of site location or application of licence conditions, including (but not limited to) stocking rates, farming systems, legislative and environmental

monitoring requirements. It should be noted that, in accordance with Section 52 of the Act, the Minister may vary licence conditions at any time to prevent or mitigate significant environmental harm or the risk of significant environmental harm.

This licence assessment is then formally referred to the EPA for their approval.

Environmental Monitoring and Management

Environmental risks are managed both at the licence assessment stage (as previously described above) and through PIRSA Fisheries and Aquaculture's ongoing Environmental Monitoring Program (EMP). The EMP requirements are stipulated in the *Aquaculture Regulations 2005* for each sector. Once a licence is approved, an EMP is assigned to allow for the ongoing monitoring by licence holders comprising a variety of physical and biological factors considered relevant to measuring the environmental effects of the aquaculture venture.

Marine-based Aquaculture:

The annual Environmental Monitoring Program includes ongoing monitoring of:

- benthic assessment (colour videotape of the sea floor and written record);
- amount and type of supplemental feed (if applicable to the species farmed);
- biomass maintained on the site;
- aquaculture waste (securing, treating, recovering);
- use of chemicals (amount, frequency and purpose);
- requirement to mark-off area and maintain structures or equipment used to mark-off area;
- farming structures (marking, mooring, maintaining, locating, and recovering);
- interaction with seabirds and large marine vertebrates.

In addition Regulations provide for:

- notification and reporting of entanglement of certain animals;
- notification and reporting of escape of stock or damage that may lead to escape of stock;
- notification and reporting of unusually high mortality rate and duty to isolate unaffected organisms.

Land-based Aquaculture

The annual Environmental Monitoring Program includes (depending on the licence class of A, B or C) the ongoing monitoring of:

- water quality testing (category B and C only);
- intake water source, method of extraction, water type (i.e. fresh, brackish etc.) and volume used per month;
- where, how discharged, if treated and volume each month of water discharged;

- amount and type of supplemental feed (if applicable to the species farmed); and
- use of chemicals (amount, frequency and purpose).

Additional requirements to be monitored can be determined from the licence assessment process on a case by case basis, or based on the results of Environmental Monitoring Program reporting.

Marine and Other Animal Interactions

The requirement to report interactions (such as entrapments or entanglements of seabirds and large marine vertebrates) form part of licence conditions and Regulations under the Act. If interactions occur then modifications to farming practices may be required.

A licensee must have a written strategy approved by the Minister for minimising adverse interactions with seabirds and large marine vertebrates resulting from aquaculture carried on under the licence (see the *Aquaculture Regulations 2005*, Regulation 19). The strategy must detail operational requirements under the following categories:

- Mammal interactions
- Great white shark interaction
- Protected species interactions
- Maintenance of infrastructure
- Site surveillance

The strategy must explain what procedures the licensee will implement to minimise these risks to a level considered acceptable by the minister. Operators may be audited against the operating practices detailed in their strategy at any time. Failure to comply with the strategy may result in an expiation fee or fine.

Aquatic Animal Health Controls

A range of controls are included in the management of licensed aquaculture activities to prevent or mitigate against diseases or parasites. All applications for new aquaculture licences are assessed for aquatic animal health risks as part of the ESD assessment (culture technique, technology and specific environment of the application). Regulations under the *Aquaculture Act 2001* require that operators report to PIRSA any significant increases in background mortality and must not move any animals showing signs of clinical disease without Ministerial approval. Requirements designed to manage other on-farm activities are included in a variety of legislation and policy.

Diseases of particular concern and those that are regarded as posing particular threats to environmental, economic or social processes are listed as notifiable under the *Livestock Act 1997*. It is an offence under this Act to fail to report the occurrence, or suspected occurrence, of a notifiable condition.

Translocation of organisms is managed through a process of Import Risk Analysis. The outcomes of these analyses, which include factors to reduce risk of disease or pest introduction and consideration of genetic integrity, are included in Orders under the *Livestock Act*, including the *Livestock (Restrictions on Entry of Aquaculture Organisms) Notice 2008*.

Use of any therapeutants or treatments can be conducted only under a Ministerial approval (for off-label use as defined by the *Veterinary Practice Act 2003*), or under conditions specified by the Australian Pesticides and Veterinary Medicines Authority, either on the label of registered products or included in Minor Use Permits.

Exotic Species

There are potential risks associated with the introduction of organisms not from the local environment. For the protection of the aquaculture industry, and of the natural environment, controls must be maintained on the introduction and movement of aquatic organisms, bearing in mind the potential risks involved with the introduction of disease and potential for genetic manipulation.

The primary concerns associated with the introduction of non-native organisms are that they may form feral populations, which may compete for habitat and reduce the availability of nutrients to local organisms.

Potential issues associated with exotic species are addressed as part of the ESD risk assessment and licence application process.

Stock Escapes

The potential for escape of aquaculture stock from a site is considered during the ESD risk assessment of the application. This assessment considers the level of risk presented by the species under consideration and the technology used. Regulations under the Act require operators to have an approved strategy to minimise and mitigate against the risk of escapes and outline the requirements that must be followed in the event of an escape.

Licensees are also required to submit a strategy relating to the escape of stock from the constraints of the licensed infrastructure and the lease area (see the *Aquaculture Regulations 2005*, Regulation 19). This strategy is required by the Minister to prevent and control the risk of escaped stock to the wild. This strategy must include methods under the following categories:

- Health monitoring
- Escape monitoring
- Dealing with escapes
- Maintenance of infrastructure
- Site surveillance
- Reporting Requirements

The strategy must explain what procedures the licensee will implement to minimise these risks to a level considered acceptable by the minister. Operators may be audited against the operating practices detailed in their strategy at any time. Failure to comply with the strategy may result in an expiation fee or fine.

Site Decommissioning

There will be times when an aquaculture site in the zone is no longer being used. In this case, the lease contract requires that the site be rehabilitated (including the removal of any infrastructure and navigation markers) by the lessee at the expiry of the lease. The lease also requires the operator to be party to an approved indemnity scheme or bank guarantee which the Minister may

draw upon if the lessee fails to clear the site. Failure to comply with clearing the site of infrastructure and navigation markers will be reported to the Department of Planning, Transport and Infrastructure as a hazard to navigation and prosecution may follow.

APPENDIX D5 – RESEARCH AND ADAPTIVE MANAGEMENT

Evidence based policies require robust research to inform the decision making process. As such PIRSA Fisheries and Aquaculture has initiated several projects with the Fisheries Research and Development Corporation (FRDC) to improve our knowledge and inform our policies, in particular, the PIRSA/FRDC Innovative Solutions for Aquaculture Planning and Management Program (IS). This suite of projects aims to develop tools to ensure a sustainable and competitive aquaculture industry for South Australia. These tools will:

- Identify more effective ways to manage aquaculture;
- Minimise the regulatory burden on industry; and
- Ensure that environmental considerations for South Australian aquaculture remain a clear priority.

The following research projects have been completed under the IS-1 program:

a) *Environmental audits of marine aquaculture* – The project examined the shading effects of intertidal shellfish long-line farming infrastructure at South Spit, Stansbury. While the relative area and degree of shading effects on seagrass meadows is low, a number of recommendations were made to reduce any potential lethal and sub lethal impacts. Overall, this project provides the basis for the enhancement of current environmental monitoring programs.

b) *Addressing seal interactions* – The project has provided comprehensive appraisal of the status of the Australian sea lion population in southern Spencer Gulf and the Nuyts Archipelago, including identification of several new breeding populations. Extensive tracking in the Nuyts Archipelago from 6 different colonies showed that there were marked inter-colony differences in foraging behaviour, and evidence of two broadly different foraging patterns - inshore (shallow) and offshore (deep) foragers.

c) *Spatial impacts and carrying capacity of aquaculture stock* – The project studied the nutrients released from Yellowtail Kingfish aquaculture in Fitzgerald Bay, and based on this data two models were produced that assist environmental management decisions. At the site scale, a seafloor deposition model was developed that predicts that areas of high sedimentation are localised around individual pens. At a more regional level, a carrying capacity model has been developed that can be used to predict the level of increased nutrient loadings in the water column associated with increases in Yellowtail Kingfish production. The outcomes of this work allowed PIRSA Fisheries and Aquaculture to make more informed decisions on total allowable biomass within the Fitzgerald Bay aquaculture zone and other zones that farm supplementary fed stock.

d) *Parasite interactions between wild and farmed Yellowtail Kingfish* – The project studied the potential for parasite interactions between wild and farmed kingfish, ways of distinguishing wild from farmed kingfish and assessing migratory behaviour of wild kingfish. The key outcomes of this project included the development of standard sampling methods for ongoing assessment of parasite prevalence and intensity in wild and farmed kingfish.

e) *Assessment of novel monitoring and modelling techniques to measure gill and skin fluke infestation* – A reliable and consistent means of measuring the level of gill and skin fluke infestation of farmed kingfish has been developed based on a computer driven scanning system. This novel technology is faster and more cost-effective than current methods, and will greatly enhance industry's ability to monitor and therefore control fluke infestations, through more precisely timing the application of control measures.

f) *Development of rapid environmental assessment and monitoring techniques* – The project was an extension of previous work undertaken to improve the tuna environmental monitoring program. The project aimed to determine similarities and differences in the DNA of benthic infaunal communities associated with finfish farming at Fitzgerald Bay, Arno Bay and Boston Bay. The number of individuals and the types of species of benthic infauna that live in the seafloor sediments are used to monitor the biological health of the environment around finfish farms. The outcomes of this project have decreased the time taken for an assessment of the condition of the environment and improved the accuracy of the assessment. Information from this project is used to standardise the finfish environmental monitoring program in line with the tuna environmental monitoring program.

g) *Extension, communication and adoption of the outputs from the PIRSA and FRDC initiatives* – Through effective relationship building, communication strategies, and extension programs, outputs of the IS projects have been communicated to a range of stakeholders including government and industry groups. Effective communication and extension of Innovative Solutions research outcomes has facilitated the integration of research driven management practices with greater public and stakeholder awareness and acceptance.

A second suite of projects under Innovative Solutions (IS-2) have been completed recently or are currently underway. The IS-2 suite of projects has been designed to provide information aimed at further supporting PIRSA's on-going efforts to improve its ecosystems-based approach to aquaculture resource management.

The following IS-2 projects have been completed:

h) *Biosecurity risk assessment and development of standardised mitigation for tuna and finfish aquaculture* – This project undertook a biosecurity hazard identification, risk analysis and audit for South Australia's marine finfish and tuna aquaculture sectors, including population of generic risk trees for biosecurity from Fletcher *et. al.*, (2004), development of a generic framework including checklists for assessing biosecurity risks and evaluation of current standards and practices, identification of risks and development of risk mitigation strategies, guidelines for surveillance, industry practices and identification of critical control points for audit purposes.

i) *Carrying Capacity of Spencer Gulf: Hydrodynamic and biogeochemical measurement modelling and performance monitoring* – The ability to obtain accurate estimates of spatial and temporal variability in carbon cycling and other macro-nutrients through the ecosystems in Spencer Gulf will provide important information about potential risks and impacts of increased aquaculture activities in the Gulf. This need will be met through the development of calibrated hydrodynamic and bio-geochemical models for Spencer Gulf that will also determine more accurate carrying capacity estimates for aquaculture areas, including the concurrent use of both supplementary and non-supplementary fed organisms within each area.

j) *A review of South Australia monitoring of aquaculture* - This external review was conducted to review existing monitoring programs in South Australia. Implementation of recommendations is underway, including industry workshops with a revised environmental program for each aquaculture sector being developed.

The following IS-2 projects are currently underway:

k) *Investigations to address key policy gaps associated with the development of clam farming in South Australia: genetic and health issues aligned to translocation and stock identification* – This project aims to characterise the genetic population structure of the clam, *Katelysia rhytiphora* in South Australia in order to determine the feasibility of this species for

aquaculture. The project seeks to identify and evaluate method(s) for differentiation between farmed and wild clams and to identify potential biosecurity issues relating to commercial clam aquaculture. Results from this project will inform policy development for clam aquaculture in South Australia.

l) *Application of high-resolution tracking technologies to understand movement and residency of pelagic sharks in southern Spencer Gulf: resolving spatial overlaps with marine industries, community activities and natural foraging areas* – The project will inform the development of industry best-practice guidelines and management strategies around shark interactions with aquaculture and fisheries activities. In addition, the project will assist in the identification of public awareness and perceptions around shark interactions which will also inform management decisions.

m) *Pacific oyster feeds and feeding in South Australian waters: towards ecosystem based management* – This project will (1) identify the feeding requirements of Pacific oysters, cockles and mussels (2) address the factors influencing food availability and (3) improve our understanding of the relationship between food availability, competition for resources and farm production. Outcomes from this project will inform management strategies for the relevant industries.

In addition, PIRSA Fisheries and Aquaculture supports studies commissioned by the Australian Seafood Cooperative Research Centre (ASCRC) and its predecessor Aquafin CRC involving six research programs for the Port Lincoln-based southern Bluefin tuna (*Thunnus maccoyii*) aquaculture industry including; production, value-adding, environment, technology transfer and commercialisation, and education and training.