

Marine Pollution Research Pty Ltd

**PROPOSED COMMERCIAL MUSSEL
& SHELLFISH AQUACULTURE
COLLINGWOOD BEACH, JERVIS BAY**

Preliminary Assessment



Existing (large) mussel raft off Collingwood Beach

20 September 2006

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SUMMARY

A & J Harvey of Tomerong, have been operating an experimental mussel aquaculture facility adjacent to Collingwood Beach, Jervis Bay for over ten years (see frontis). They now propose to take the facility to full commercial production by (i) expanding the grow out facilities to the present total lease area, (ii) modify the culture method from raft culture to long-line culture, and (iii) introduce additional endemic native shellfish species to the facility. Part of the trigger for this, and the subject of this application, has been the proclamation of the Jervis Bay Marine Park Operational Plan which requires formal environmental impact assessment and renewed permits for the existing facility to continue.

The proposal is to convert existing swing mooring rafts, currently occupying 2.2 ha of water area, to long-line aquaculture of 8 ha, (matching the area currently licensed), plus provide anchoring and navigational clearance space of 3.2 ha, giving a total water lease area of 11.2 ha. The facility would be used principally for mussel grow-out and a proportion of the lease area would be used for the grow-out of other shellfish species endemic to Jervis Bay (such as Flat oysters, Scallops and Pearl oysters). The long-line culture method is a well established method for a number of different shellfish grow-out operations around the world and in Australia. In NSW it is used successfully for mussel farming in Twofold Bay and for pearl farming in Port Stephens.

Aquaculture operations for the commercial on-selling of the crop would involve, (in the case of mussels), spat collection at existing spat leases in Twofold Bay, transfer of the spat, (attached to hanger ropes) to the long-line facility in Jervis Bay, grow out and harvesting of the mussels. Aquaculture for other shellfish (all derived from Jervis Bayspat) , would involve grow-out and harvesting for edible species, and, in the case of pearl oysters, cultivation of pearls plus grow-out and harvesting for pearls. All suitable harvested product (including Pearl oyster meat would be sold commercially. . The proposal is to undertake all these activities, with appropriate environmental controls.

Part 3A of the *Environmental Planning and Assessment Act 1979* applies to this aquaculture proposal. This Preliminary Assessment report is intended to outline the project in sufficient detail to allow for an initial understanding as to what is proposed and to outline the environmental aspects which are to be further detailed in a subsequent Environmental Assessment Report, anticipated to be complete by October 2006. Once the project is approved by the Minister for Planning, transition to the new configuration would commence in January 2007 and would take around five years to reach full production.

Extensive community and Agency consultation has taken place for the project. Additional consultation will occur during the preparation of the Environmental Assessment Report. Broad environmental and social issues identified during this process include:

- Water and sediment pollution
- Introduction of exotic species
- Marine fauna interactions (including entanglement)
- Impact on flora and fauna
- Visual amenity and noise
- Alienation of waterways

These issues are to be addressed in greater detail in the Environmental Assessment Report. The proponents will also be preparing a draft Statement of Commitments to describe how these issues will be managed throughout the implementation of the project.



Existing (small) mussel raft off Collingwood Beach

1 INTRODUCTION

1.1 Background to Proposal

In January 1998, the NSW Government declared Jervis Bay a marine park under the *Marine Parks Act 1997*. The marine park is a multi-use park that aims to conserve marine biological diversity and marine habitats, while catering for a broad range of recreational and commercial activities (MPA, 2002). The Marine Parks Authority issued a Jervis Bay Zoning Plan, in June 2002 and an Operational Plan, in October 2003. This proposal is subject to these plans. Management actions for aquaculture in the Operational plan are;

- To work with NSW DPI Fisheries, proponents, local Councils and other relevant agencies to ensure that aquaculture proposals in or adjacent to the marine park are adequately assessed and that potential impacts, including pollution are adequately considered,
- To limit aquaculture in the Jervis Bay embayment to less than 2% of the area of the park (440Ha), subject to the conduct of a full Environmental Assessment that assesses cumulative impact. Also, that *intensive* aquaculture will not be permitted, nor the introduction of non-local species, and
- To allow the existing aquaculture enterprise off Plantation Point [the subject of this proposal] to continue pending the issue of appropriate licences/permits, without which it will cease to operate.

Part 3A of the *Environmental Planning and Assessment Act 1979* applies to this aquaculture proposal (see 3.2 below). This Preliminary Assessment report is intended to outline the project in sufficient detail to allow for an initial understanding as to what is proposed, and to outline the environmental aspects which are to be further detailed in a subsequent Environmental Assessment Report. The environmental assessment for this proposal is part of the approval process for the appropriate licenses/permits to be issued.

1.2 Project Need

Aquaculture is a highly sustainable food producing industry defined as the commercial farming of fish, molluscs, crustaceans and aquatic plants for sale. *Extensive* aquaculture, where the product obtains nutrients from naturally occurring food in the water, is an ecologically sustainable industry, which is becoming more important for food production as fishing for wild-stock fisheries become less viable, due to both over-fishing and loss of economic viability.

The facility would be used principally for mussel grow-out and a proportion of the lease area would be used for the grow-out of other shellfish species endemic to Jervis Bay (such as Flat oysters, Scallops and Pearl oysters).

Mussel aquaculture in Australia is a relatively undeveloped venture. In the period 2003/2004 total NSW mussel production was 43.8 tonne for a market value of about \$260,800 (NSW DPI Fisheries Aquaculture statistics - Fisheries website). Currently, New Zealand greenlip mussels constitute up to 40% of the Sydney market. In NSW, Twofold Bay produces between 60 and 70 % of total NSW production, and the present Jervis Bay operation produces up to 20 tonne a year.

Mussel farming in NSW has been conducted in both Jervis Bay and Twofold Bay since the mid 1970s. Aquaculture for pearl oysters in Australia, has increased as the international demand for pearls has not been met by traditional Japanese suppliers. Aquaculture for scallops and Flat oysters is relatively new in NSW. Trials undertaken in Jervis Bay and other south coast embayments indicate that these species (which are also native to Jervis Bay) can become successful commercial crops.

1.3 The Proponents

The proponents are Andrew and Julie Harvey of Tomerong. They are long-term local residents and have been operating the existing experimental mussel raft aquaculture leases for over 10 years (see frontis). They took over the leases from Harry Booth, another long-term resident, who established the original experimental mussel rafts in 1974 under the guidance of Dr. R J McIntyre of the University of NSW. Trial commercial operations commenced in 1977.

2 PROJECT DESCRIPTION

2.1 Site Selection

A major restriction on aquaculture site selection is wave action, which can damage infrastructure and disrupt growing cycles of shellfish. Thus, suitable growing areas are restricted to semi-sheltered waters of the Bay. Trial mussel aquaculture has been undertaken at a number of locations around Jervis Bay since 1974. These sites have, of necessity, been located on the southern side of the Bay, as the northern peninsula is used by the Department of Defense as a live firing range which restricts access to that area and to a buffer area along the southern shore of the Bay. Declaration of the Marine Park introduced zoning, which further excludes aquaculture from certain potentially suitable areas of the Bay. The existing commercial aquaculture facility has been located in Collingwood Bay for thirty years and has proved to be safe and reliable. The zoning in the area of the Bay containing the lease (habitat protection zone) allows aquaculture. Accordingly the proposal is for the location to remain at the existing site.



Fig 1
Relationship of Present Leases to Proposed Lease
and Location of Land Based Site plus Work Vessel Mooring Site

2.2 Site Location

The proposed aquaculture facility is to be situated in waters around 7 to 9 m deep off Collingwood Beach, located between Huskisson and Vincentia on the southern shore of Jervis Bay (Fig 1). The coordinates (GDA 94 datum, UTM zone 56 projection) are as follows:

SW	288840 E,	6117346 N
NW	288840 E,	6117746 N
NE	289120 E,	6117746 N
SE	289120 E,	6117346 N

2.3 Site Description

The existing inshore lease is located 800 m east of Collingwood Beach and 550m north of Orion Beach. The existing outer lease is located 1250 m east of Collingwood Beach and 1100 m north of Orion Beach. The proposed consolidated lease is located intermediate to these two leases; 1 km east of Collingwood Beach and 950 m north of Orion Beach.

2.4 Surrounding Land Use

Jervis Bay is a major environmental conservation and recreational resource. It offers National Parks, bushwalking, wildlife and dolphin watching, diving and snorkelling, sailing, windsurfing and kayaking, fishing, golf and horse riding. The shoreline includes white sandy beaches, towering sandstone cliffs, sparkling blue bay waters and opportunities to view the abundant flora and fauna. A resident pod of about 60 bottle-nosed dolphins live in the Bay and whales are seen on their migrations up and down the coast. A seal colony exists south of the Bay and a colony of Little Penguins resides on Bowen Island at the entrance to the Bay.

As indicated on Fig 1, there is residential development along the foreshore of Collingwood Beach plus residential development and the village of Vincentia overlooking the southern end of the embayment. There is a caravan park at the northern end of the embayment (north of Moona Moona Creek). There are private moorings in the southern embayment and there is a catamaran sailing club at Plantation Point.

2.5 Lease Details

Currently the two swing mooring rafts occupy approximately 2.2 ha of water space. The rafts are located within existing lease areas of 4 ha each (Fig 1), approved under NSW DPI Fisheries Class G (experimental) Aquaculture permits (AL9002 and AL9003). The proposed lease will consolidate the two existing lease areas, into one single lease area. It is 400 m long (north to south) and 280 m wide (east to west). This is a total area of 11.2 ha, of which 8 ha would be available for aquaculture, as is currently available, plus 3.2 ha of buffer area, where navigation buoys plus the anchor lines and anchors for the long-lines would be accommodated (Fig 2).

2.6 Lease Layout

The proposal is for the construction of a long-line based aquaculture facility to replace the present swing raft facility. Long-lining involves a system of horizontal (backbone) ropes at or near the

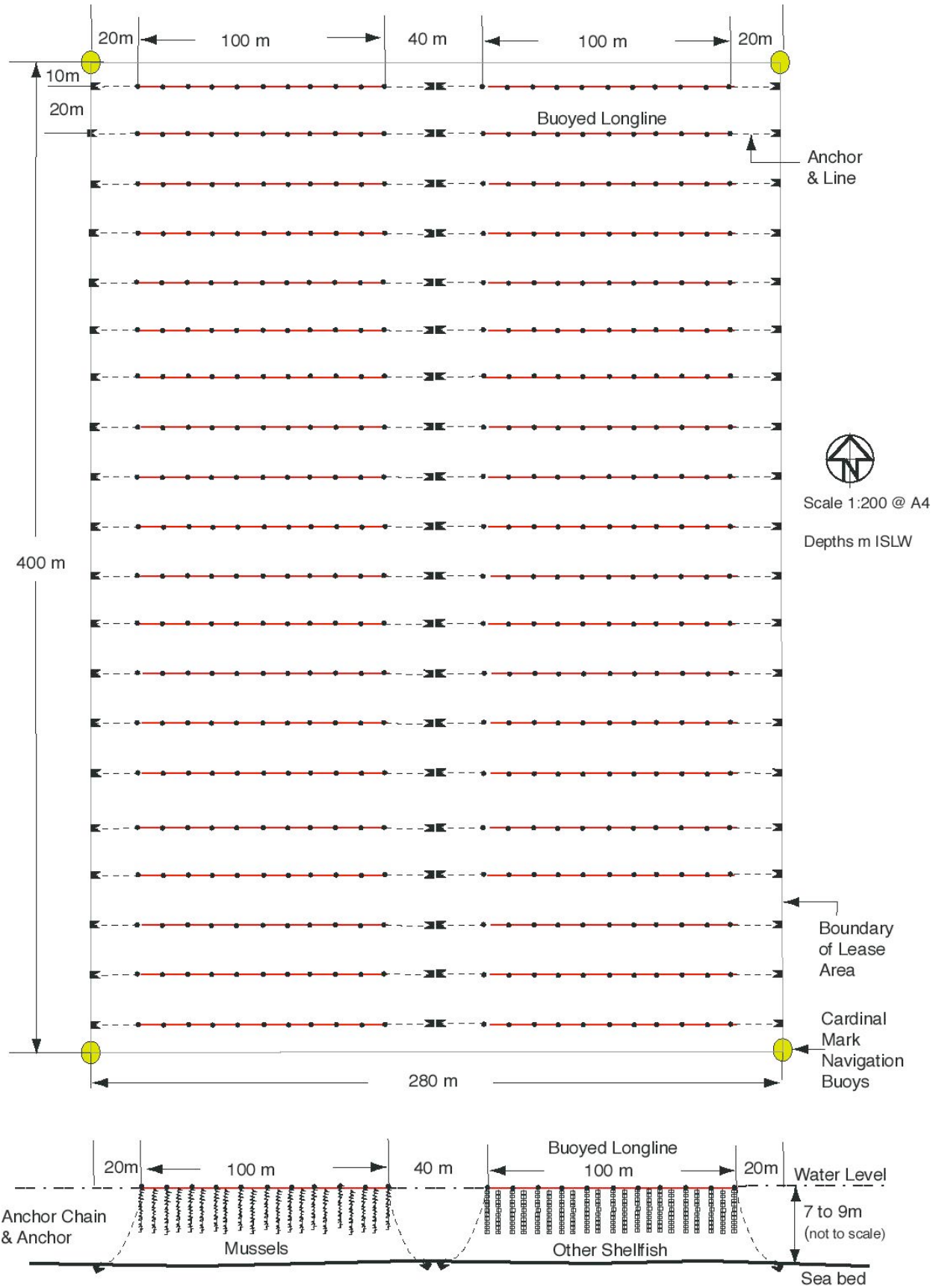


Fig 2 Schematic Plan of Proposed Long Line Lease (to scale)

surface with fixed buoys to provide the main flotation and anchors at either end of the line to provide stability (Fig 2). Vertical hangers or droppers are attached along the long-line at a density dependent on site conditions. For mussels, the lines are kept taut by shellfish weight. For other species, which are initially deployed as small spat in baskets, weights are used at the bottom of the dropper line to maintain the lines taut.

Long-line systems in relatively sheltered waters can be deployed with surface backbone lengths up to 200 m long. For the present proposal, the intention is to limit backbone surface lengths to 100 m to ensure a taut rope policy for environmental and safety purposes. Backbone lines are generally 24 to 38 mm polypropylene hard lay UV stabilised rope. Long-lines are to be placed in parallel lines spaced 20 m apart to allow for even feeding by stock suspended from the lines and to allow access to the lines for service vessels. For this proposal there will be up to 40 lines at full production.

The long-lines are kept at the surface by deploying sufficient buoys to keep the lines taut. The current industry standard is a 150 litre round buoy attached directly to the backbone. The number of buoys deployed on the backbone line can vary over a growing season as the weight of the crop increases. For the Jervis Bay proposal, there will be a fixed number of surface 150 litre round buoys (one per 10 m of line) with a variable number of 20 litre buoys deployed between the fixed buoys and pulled below the water surface. This system retains the flexibility for taut rope maintenance without significantly changing the visual amenity of the lease. The long-lines would be anchored using an industry standard such as the 50 kg stingray anchor rated at 12.5 tonne holding power. As required by Maritime NSW approved lighted Cardinal Mark buoys will be deployed at each of the four corners of the lease, with the location of these navigation marks notified to the Commonwealth Hydrographic Service for inclusion onto Australian charts.

2.7 Lease Operations

For mussel aquaculture, the dropper lines are initially deployed in existing spat collection leases in Twofold Bay where mussel spat attaches directly to the ropes. The ropes plus attached mussels are then brought to Jervis Bay to be hung from the backbone lines. For scallops, pearl and flat oyster aquaculture, hatchery-produced spat sourced from Jervis Bay stock would be deployed in basket systems suspended from the long-lines, in the manner of the approved basket systems utilised in Port Stephens. Methods currently used to attach slightly larger (and thus more predator-proof) scallops or oysters directly to the hanger ropes, rather than in baskets may also be used, as this method significantly reduces the need for on-site cleaning of baskets.

The long-lines would be serviced in situ using a purpose-built vessel, which would require a mooring to be placed in Currambene Creek at Huskisson (Fig 3). Lease servicing activities include:



Figure 3
Typical Aquaculture Work Vessel
as used in the Victorian Mussel Fishery

- Inspection and maintenance of the long-line facility plus adjustments to maintain the long-lines in a taut rope condition
- Periodic hauling-in of dropper lines and/or baskets for thinning out shellfish or fouling organisms. Thinning and cleaning would occur within the vessel using a water spray system with wash water screened and collected into a settlement tank system and with cleared settled wash water screened again prior to being returned to the Bay via a submerged pipe. Collected fouling material from cleaning and screening would be stored in bins for appropriate disposal on-shore.
- Harvesting and cleaning of shellfish product, which would involve a similar water spray-based system plus a mechanical abrasion system to remove fouling organisms. During harvesting operations and prior to cleaning/washing, shellfish would be removed from baskets manually or mechanical strippers would be used to strip shellfish directly off the dropper lines. Collected fouling material from cleaning and screening would be stored in bins for appropriate disposal on-shore.
- Monitoring, as part of the NSW Food Authority, Seafood Quality Assurance Program. (SQAP), plus other monitoring specific to the proposal.

2.7.1 Hours of operation

The hours of on-water operation would generally be between 7 am and 4 pm, three days per week initially and up to five days per week ultimately. Start and finish times would be staggered between these hours to account for suitable working conditions (generally dependent on wind speed and direction) and on seasonal farming cycles (stocking, routine maintenance or harvesting). During peak mussel harvesting time there may be the need for occasional Saturday harvests between 8 am and 1 pm. No routine lease servicing work would be scheduled on Saturdays or Sundays. Emergency call outs to the lease (e.g., for repairs during or after storms) could occur at any time.

2.8 Land Based Operations

Maintenance materials, harvested dropper lines, plus solid wastes would be transferred from the service vessel to work vehicles at the existing public wharfs at Huskisson. The public wharf would no longer be used for cleaning shellfish as is presently the case. Selling of shellfish to the general public from the wharf environs would continue (subject to appropriate permits).

Operational on-land transport involves vehicle movements between the Currumbene Creek public ramp car park, Huskisson wharf and the maintenance and storage site at Tomerong (DP745474). Additional vehicle movements will involve delivery of aquaculture products to retailers in the region. Work vehicles would comprise domestic vehicles and light trucks. Trips to Twofold Bay to deploy and retrieve spat dropper lines would involve a light truck with a trailered dingy as occurs at

present. The volume of traffic movements will not be significant in terms of existing vehicle movements in the area.

Land-based cleaning and maintenance of long-line infrastructure (mainly drying and cleaning of used dropper lines) would be undertaken in the same manner as currently employed, using a new facility (shed and drying racks) to be constructed on the proponent's rural property at Tomerong (Fig 1). The facilities would also be used to store and maintain equipment used in the water-based activity. Site runoff control measures will be put in place to minimise potential pollution of the unnamed headwater creek (a tributary of Currumbene Creek which flows through the property), during both construction and operation of the facility. The impact of the proposed activity on existing land use will be minor. The nearest permanent rural residential premises are approximately 175m south, not in line of sight and screened by dense eucalypt woodland and understory scrub.

Based on present experience, solid waste volumes derived from both water-based and land-based operations would not be high, and solid wastes would be disposed of under an approved Waste Management Plan. Disposal would be either at approved Council facilities or could be beneficially reused agriculturally.

2.9 Project Cost Estimates

Full set-up of the project would be in the order of \$560,000. The major cost for the project will be establishment of the long-line system. On current estimates, establishment could cost up to \$390,000. Establishment costs for purpose-built vessels and purchase of vehicles are around \$160,000 and land-based infrastructure costs are around \$10,000.

2.10 Key Technical Issues

2.10.1 Construction

Construction of the long-lines, chains, anchors and surface buoys will be undertaken at Tomerong. The long-lines can be deployed from any suitably sized vessel and would not require any special equipment. The critical element is the precise location of the apparatus, which can be achieved by precise survey alignment. Securing of the anchors is best achieved by use of a diver to guide each anchor to its position and bury it in the correct orientation. Installation of navigation buoys will be undertaken following the requirements of NSW Maritime. Installation of the navigation buoys, long lines, transfer of the existing shellfish crop and decommissioning of the existing rafts will be staged according to the stage of the growing season and prevailing weather.

2.10.2 Operations

Marine fauna interactions will be managed by the use of a taut-rope policy, plus implementation of an approved entanglement protocol, adapted from the Twofold Bay/Port Stephens plans, and

developed under the direction of a Committee with representatives from MPA (JBMP), NSW DPI Fisheries and DEC.

Vessel interactions will be dealt with by placement of appropriate lighted navigation (Cardinal Mark) buoys to provide warning of restricted waters. A vessel entanglement protocol will be developed in conjunction with NSW Maritime, the local Volunteer Coastal Patrol and NSW Police.

Harvest/cleaning water quality will be addressed by suitable vessel-based screening of process waters plus containment of solids, plus further screening and deep water discharge of settled process waters. The methods employed will be based on those developed for mussel and pearl farming in Twofold Bay and Port Stephens respectively.

2.11 Project Timetable

Key Project milestones are as follows:

Preliminary Assessment	September 2006
Environmental Assessment Submission	November 2006
Commence deployment of Long-lines (estimated start)	February 2006

2.12 Project Implementation

Attached at Appendix 1 is a table which provides a concise description of the project. Project implementation involves the following steps:

- Purchase and fit out of service vessel;
- Purchase and establishment of approved navigation marks at the lease corners;
- Progressive installation of long-lines, with present mussel aquaculture transferred from existing raft culture to long-lines and new mussel plus other shellfish aquaculture progressively ramped up;
- Decommissioning and removal of existing rafts;
- Construction of land-based infrastructure; and
- Purchase of vehicles for product transport and other duties (as required).

2.13 Development over Time

The initial aim is to achieve production of about 80 tonnes of mussels per season. At current stocking densities, this would require twenty long-lines, which is half of the ultimate farm size. The longer term aim is to trial and build up to full production, mixed shellfish grow-out to a total capacity of 160 tonne per annum from the 40 long-lines. In broad outline, lease development over the first five years can be summarised as follows:

- Year 1 Deploy Navigation Marks plus 20 long-lines and stock all long-lines with mussels. Decommission existing rafts.
- Year 2&3 Consolidate production of mussels on the 20 long-lines and deploy up to five extra long-lines for grow-out trials with other edible shellfish. Commence grow-out trials for pre-implant pearl oysters.
- Year 4 Depending on preliminary results of other shellfish growth trials, deploy remaining 15 long-lines for mixed shellfish grow-out. Complete pearl oyster trials with implant plus post recovery grow-out and harvesting.
- Year 5 Full utilisation of 40 long-lines for shellfish and pearl oyster production with mix of cultures based on results of 'other shellfish' trials in preceding four years.

3 STATUTORY AND POLICY CONTEXT

3.1 Commonwealth Legislation

Part 3 of the *Environment Protection and Biodiversity Conservation Act 1999*, provides that an action that has, or is likely to have, a significant impact on a matter of national environmental significance (NES), may progress only with the approval of the Commonwealth Minister of Environment and Heritage, as provided under the provisions of Part 9 of the Act. Matters of NES include:

- World Heritage properties,
- Ramsar wetlands of international importance,
- Listed threatened species and communities,
- Internationally protected migratory species,
- Commonwealth marine areas, and
- Nuclear actions.

In 1999, the whole of Jervis Bay and surrounds were placed on the Register of the National Estate and there are a number of endangered, vulnerable and protected species, which inhabit or spend time in Jervis Bay. Accordingly a referral to the Minister will need to be made. However, based on the preliminary assessment undertaken for this project and from the experience of other similar operations in Twofold Bay and Port Stephens, it is considered that the proposal will not have, nor will be likely to have, a significant impact on a matter of NES.

The proposed lease area is within 5 nautical miles of an installation and, under Section 3B of the Control of Naval Waters Act 1918, these waters are “declared naval waters”. Under the Control of Naval Waters Regulation 1922 (Reg 13) moorings are not to be laid in naval waters without permission. Accordingly, the project will require the “written permission from the superintendent of the naval waters” for laying of the moorings.

3.2 State Legislation and Policies

Environmental Planning and Assessment Act, 1979

The proposed development will be assessed in accordance with the Environmental Planning and Assessment Act, 1979 (*EP&A Act*) and the Environmental Planning and Assessment Regulation, 2000. On 1 April 2006, the Director-General of the Department of Planning, as delegate of the Minister for Planning, formed the opinion that the proposed Mixed Culture Shellfish Aquaculture Facility is a development of a kind described in *State Environmental Planning Policy (Major Projects) 2005* and consequently, a Major Project to which Part 3A of the *Environmental Planning and Assessment Act 1979* (the Act) applies. SEPP (Major Projects) 2005, includes under Schedule 1, aquaculture as a class of development covered by the SEPP, provided that the aquaculture activity is located in environmentally sensitive areas of State significance (Schedule 1, clause 2(2)). Environmentally sensitive areas of State significance include land reserved as a marine park under the Marine Parks Act 1977 (SEPP, clause 3(3)).

Marine Parks Act 1977

The proposed lease area is within Jervis Bay Marine Park, which is managed under the Marine Parks Act 1997 by the Marine Parks Authority NSW. All activities conducted within the marine park are subject to the Marine Parks Act and Regulations, and the JBMP Zoning and Operational Plans. The existing aquaculture activity, undertaken under scientific permit/s initiated prior to establishment of the marine park, is now subject to these, and other, statutory requirements for environmental assessment and appropriate commercial licensing.

Fisheries Management Act 1994.

The proposal requires an aquaculture permit under Section 144 of the Fisheries Management Act 1994. The environmental assessment will also need to consider possible impacts on endangered and threatened species and on migratory species considered endangered or threatened as listed under the Act.

Coastal Protection Act 1979

Under the Coastal Protection Act 1979 the proposed lease area is within the coastal zone as defined by Section 4 of the Act. The lease area is however subject to environmental planning instruments and therefore does not require the concurrence of the Minister administering the Act. The proponent does however require the consent of the landowner, the Minister for Land and Water Conservation, to undertake the activity.

National Parks and Wildlife Act, 1974

The National Parks and Wildlife Act, 1974 relates to the conservation of wildlife and its critical habitat; threatened species, populations and ecological communities and their habitats. The DEC via the National Parks and Wildlife Service administers the Act and within Marine Parks, the Act can provide for the management and conservation of mammals, birds and reptiles.

Threatened Species Conservation Act, 1995

The Threatened Species Conservation Act, 1995, is administered by the NSW Department of Environment and Conservation (DEC). The environmental assessment will need to consider possible impacts on endangered and threatened species and on migratory species considered endangered or threatened.

NSW Coastal Policy 1997 and SEPP 71

The NSW Coastal Policy 1997 applies to Shoalhaven City Council and the proposal lies within the coastal zone as defined by the policy. State Environmental Planning Policy No. 71 – Coastal Protection, gives legal force to certain elements of the coastal policy and provides a development assessment framework for new development in the coastal zone.

4 CONSULTATION

4.1 Approach

Consultation to date has taken many forms, including direct approaches to government agencies and stakeholder groups likely to be affected by the project, and a public meeting. Discussion and feedback has been assisted by awareness of the existing activity amongst the stakeholders. Thus the focus has been on exploring existing impacts, describing the proposed changes and working through the perceived impacts of those changes. Stakeholder feedback had been taken into consideration during the development of the proposal.

4.2 Issues Raised

4.2.1 Government agencies

An initial planning focus meeting was held at Nowra on 24th February 2005. The meeting was attended by:

- Department of Environment and Conservation,
- Department of Lands,
- Department of Planning,
- Department of Primary Industries (Fisheries),
- Department of State and Regional Development,

- Indigenous community representatives,
- Marine Parks Authority,
- Maritime NSW, and
- Shoalhaven City Council

Several subsequent departmental and council meetings and site inspections have also occurred.

Issues raised during these consultations are summarised below:

- Visual amenity associated with lease infrastructure,
- Marine fauna interactions,
- Visual amenity associated with water quality from lease maintenance activities,
- Impacts on sea-bed sediment quality,
- Mussel larval deposition resulting in increased mussel populations in the Bay,
- Possibility of introduction of exotic species via mussel transport from Twofold Bay,
- Impact on coastal processes arising from the lease,
- Impacts of coastal processes on the lease (storm damage), and
- Possible interference with Defence exercises (Navy)

4.2.2 Residents, businesses and interest groups

A public meeting was held on 31st March 2004, which had been promoted on community radio and the local press. Since that time ongoing discussions and meetings have been held with a wide range of stakeholders. Groups consulted to date have included:

- Chamber of commerce/tourism
- Cruise/Hire boat operators
- Dive Clubs
- Dive operators
- Dolphin Cruise operators
- Huskisson Amateur Fishing Club
- Huskisson Wharf Committee
- Huskisson Woollamia Community Voice
- Indigenous community members and LALC
- Keelboat Sailing Clubs
- Recreational Fishing Groups
- Vincentia Ratepayers Association
- Vincentia Yacht Club
- Volunteer Coastal Patrol

Issues raised to date include:

Operations

The size, scale and orientation of the lease in relation to the existing raft system.

The scale and size of the lease in relation to the bay and to the 'permitted' aquaculture activity.

Details of ropes to be used for long-lines.

Will the rafts remain.

Size of service vessel, harvesting and operating times and vessel movements.

How will scallop aquaculture be performed.

Is pearl oyster meat edible.

Conflict with other users

Will the lease restrict use of the in-shore waters off Collingwood Beach.

Will it affect current club sailing courses.

Will it affect any future proposal for a marina at Plantation Point or Huskisson.

Will it affect tour boat operators.

Will fishing and diving be allowed inside or around the lease area.

Navigation Hazard

Will the lease be suitably marked at night.

Will boats be excluded from or allowed in the lease.

What happens if boats get stuck in the lease.

Need details of construction to assess boating hazard and rescue.

Flora and Fauna

Introduction of exotic species.

Shading impacts on sea bed ecology.

Possible harm to whales via entanglement.

Where will birds now roost when rafts gone.

Can the sea-horse population currently around the rafts be saved/transferred to the long-lines.

Are local native species to be farmed and will there be expanded populations of wild stock of the species to be farmed.

Where do the spat for scallops and Flat oysters come from.

Pollution and amenity

What will the visual impact be.

Will the scallops and oysters require depuration.

Will mussel cleaning continue at the Huskisson public wharf.

Social

Is this the thin edge of the wedge with regard to taking up the full 440 ha potential available for aquaculture.

Will mussels and other harvested shellfish still be available for purchase at Huskisson public wharf.

Are there educational spin-offs available from the proposal.

Impacts on quality of life.

Impact on property values in Jervis Bay.

Serious threat to white beaches.

Not environmentally sustainable.

Allowing industry into the bay will jeopardize tourism.

4.3 Future consultation

It is proposed to continue discussions with stakeholders consulted thus far. It is also proposed to prepare a project information sheet for distribution to residents directly fronting Collingwood Beach and within eye-line of the lease area. Opportunity will be also made available for these residents to meet and discuss issues with the proponent. Advertisements will be placed in the local press during display of the Environmental Assessment, providing contact details to inform a wider audience.

5 PRELIMINARY ENVIRONMENTAL ASSESSMENT

5.1 Overview

As indicated in Section 4 above, the following broad environmental and social issues have been identified as being relevant for the environmental assessment of the aquaculture project:

- Water pollution
- Sediment quality
- Introduction of exotic species
- Marine fauna interactions
- Impact on flora and fauna
- Visual amenity
- Noise
- Alienation of public space

Preliminary assessment and the scope of investigations already undertaken or proposed for the key issues are set out below.

5.2 Key Environmental Issues

5.2.1 Water and sediment quality

Preliminary research undertaken around the existing mussel rafts during maintenance and harvesting operations indicates that water pollution, caused by turbidity plumes, is insignificant. This arises because Jervis Bay has a low silt component (the main visual element of plumes). Further studies will be undertaken to confirm these preliminary results.

Preliminary research on sediments under and adjacent to the present mussel rafts indicate no measurable or visual impact on sediment quality or benthic fauna community structure. Based on the results of similar studies on existing long-line aquaculture facilities, as undertaken in Port Stephens and Twofold Bay, it is not expected that there will be an issue with sediment quality in Jervis Bay arising from the proposal. This conclusion would be examined and monitored by the NSW DPI (Fisheries)-sanctioned sediment monitoring program already in place.

5.2.2 Introduction of exotic species

There are a number of existing pathways whereby exotic organisms can reach Jervis Bay, including visiting boats and ships and by coastal transport of water bodies with entrained organisms. The specific risk associated with the proposal is introduction of exotic macro-species via the hanger ropes and introduction of toxic phytoplankton via retained water on the ropes or in the transported mussels when the spat is transported from Twofold Bay to Jervis Bay. This potential impact is already being managed in a number of ways:

- Contact is made with Twofold Bay mussel farmers and with Food Safe NSW prior to harvesting spat hangers, to determine whether toxic phytoplankton have been detected in the routine phytoplankton sampling program underway at Twofold Bay and to determine whether there are specific closures in place,
- Cleaning of the ropes when harvested in Twofold Bay eliminates many macro-fouling organisms at source and allows for direct inspection for known exotic species,
- Mussel ropes are kept out of the water for at least 12 hours to de-water them and to kill other fouling organisms; and
- A routine phytoplankton monitoring program is also in place in Jervis Bay.

This procedure has been operating for some time and would be formalised into an Exotic Species Management Plan. Additional recommended steps include regular inspections of the long-line and dropper line infrastructure for known exotic species plus formal contacts with NSW DPI Fisheries staff responsible for monitoring the spread of exotic species into NSW waters (for identification information and early warning notices). The Exotic Species Management Plan would also utilise the experience and appropriate procedures developed for the mussel industry in other states.

5.2.3 Marine biota interactions

This has been considered a key issue for Twofold Bay and Port Stephens aquaculture assessments and is a potential issue for Jervis Bay. Some use is made of the Collingwood Beach embayment by dolphins, whales, penguins and diving birds, although the site is not regarded as a critical site for these animals. The use of the site by sharks, seals and turtles is not considered to be significant. The risk of biota interactions will be minimised by use of the 'taut rope policy', whereby regular maintenance is used to ensure that the long line plus dropper line infrastructure is kept taut. An Entanglement Management Plan will be developed, based on other similar plans in place in Twofold Bay and Port Stephens but will be adapted for local conditions under the guidance of local agency input (JBMP, NSW DPI Fisheries, DEC-NPWS).

5.2.4 Flora and fauna

The proposed lease area has been located over bare firm sandy substratum well away from seagrass beds or rocky reef structures. There are no seagrass beds or reef algae beds in the vicinity of the lease area and thus there is no key flora issue in this regard. There are also no shading issues.

With regard to fauna issues the following are considered key issues:

- Risk of increased mussel populations in Jervis Bay

The concern is that increased number of mussels introduced into Jervis Bay may increase the overall spawning of mussels in the bay leading to increased wild populations on rocky shores and reefs in the Bay. Research in Twofold Bay indicates that this is unlikely to be a problem and that the potential increase in populations arising from farm spawnings was less than the background variation in natural spawning of mussels.

- Impacts on threatened or listed species

Preliminary assessment of the possible threatened species of the locality (as determined via literature review and via Bionet and EPBC data-base searches) indicates that, other than the marine biota interactions discussed above) there are unlikely to be any other key issues with regard to threatened species, Endangered Ecological Communities or migratory species.

5.3 Key Social Issues

5.3.1 Visual amenity and noise

Visual amenity impacts will be minimised by placement of the lease 1 km off Collingwood Beach and 950 m from Orion beach. Thus there will be a very low viewing angle from beachfront residences, and views from other, elevated residences at Vincentia are interrupted by vegetation or other buildings. The taut line policy will keep the main buoys low in the water with subsidiary

buoys kept below water. Four white flashing cardinal marks will replace the two yellow flashing lights currently on the rafts.

Noise will result from the operation of motors plus machinery on the vessel used to service the lease and from servicing activities including staff talking. This will only occur during normal working hours, except for potential emergency events and will be similar to noise arising from commercial vessels currently operating in the Bay. Notwithstanding this conclusion, a number of measures and protocols to minimise noise, as developed for the pearl-farming activities in Port Stephens, would be incorporated into the noise management plan for the proposal.

5.3.2 Alienation of the waterway

The combination of literature review and consultation to date indicates that there are no substantial issues regarding navigation around the lease. There are also no substantial issues identified with whale, dolphin, seal or penguin watching activities and there are likely to be educational benefits for tour operators. No conflicts with commercial fishing operators, recreational fishers, or dive tour operators have been identified. The local dive club has negotiated an access arrangement with the proponent. There is an issue with the Vincentia Yacht Club for some of their sailing courses, which still needs to be understood and resolved. Other sailing clubs did not express any concerns.

6 REFERENCES

The project assessment to date has utilised a wide review of the literature. The following major document sets or resources for documenting environmental and social considerations for Jervis Bay and for assessing potential environmental impacts plus potential mitigation and management measures were found to be valuable:

General:

Cho, G., Georges, A. and Stoutjesdijk, R. (Eds). Jervis Bay -A Place of Cultural, Scientific and Educational Value. ANCA: Canberra (1995).

Environmental aspects and listed species:

- The two series of environmental study reports prepared for Jervis Bay by CSIRO and by NSW Fisheries between 1988 and 1994.
- NSW Fisheries (1994) Jervis Bay Reserve Draft Management Plan Part B Resources document.
- Valuable resources for listed species and EECs are available on the NSW NSW DPI Fisheries, NSW DEC and Commonwealth DEH web sites.

Aquaculture methods, Social issues plus environmental impact and mitigation:

- Technical reports on various aspects of aquaculture prepared by NSW Fisheries (now NSW DPI Fisheries). Some of these are available on the web site of NSW DPI Fisheries.
- EIS documentation for the two Twofold Bay staged mussel farm developments plus the agency assessment reports for the stages.
- EIS documentation for Port Stephens Pearl Aquaculture.
- Various web sites for other State Fisheries or natural resource Management agencies with references to mussel or pearl aquaculture.

APPENDIX 1 PROJECT IN SUMMARY

Project	Commercial mussel and shellfish aquaculture project Collinwood Beach, Jervis Bay
Objectives	Sustainable development of commercial shellfish aquaculture in Jervis Bay
Major elements including any environmental impact mitigation measures	<ul style="list-style-type: none"> • Compliance with regulatory requirements subsequent to establishment of Jervis Bay Marine Park • conversion of existing swing mooring aquaculture activity to longline culture • Expansion of existing activity to currently allowable aquaculture lease area • Transfer of cleaning activities from Huskisson wharf to in situ cleaning at lease area • Implementation and site specific development of marine fauna interactions management protocol • Further development of mussel spat collection and transfer protocol • Expansion and impact mitigation of land based materials handling infrastructure • Trialing and introduction of additional native shellfish species aquaculture within existing lease area
Any ancillary works	All necessary infrastructure and proposed works would be located on existing sites in Jervis Bay and at Tomerong
Outline of construction methods	<ul style="list-style-type: none"> • Long line infrastructure would be prepared at Tomerong. This would include stringing of longlines and buoys, attachment of anchors, preparation of shellfish hangers and all associated infrastructure • Installation of Maritime NSW cardinal marks would involve barge and mooring deployment equipment • Deployment of longlines would involve Surveyors and SCUBA divers positioning the infrastructure and a surface team installing longlines • Removal of existing rafts would involve on-water barge/boat deconstruction of the rafts and removal and transportation to Tomerong
Outline of operations	<ul style="list-style-type: none"> • Shellfish aquaculture involves the static deployment of grow out infrastructure at approved lease areas • Mussel longline aquaculture involves attached mussels growing on subsurface vertical hangers attached to surface level longlines supported by buoys • Other shellfish aquaculture involves spat of local

	<p>species grown out in daisy-chained cages hung from the longlines</p> <ul style="list-style-type: none"> • Harvest season activity involves regular (2-3/week and potentially up to 5) harvests on site by boat plus maintenance activities • Off season grow out involves occasional line and cage cleaning, infrastructure maintenance and surveillance • Bay water is used for cleaning purposes and a system of filtration plus settlement is used to remove solids from the waters prior to return of water to the bay • “Spat” mussels are sourced from rafts in Twofold Bay and transported by road to Jervis Bay • Harvested and cleaned shellfish is brought to Huskisson wharf for commercial distribution • Waste material retained after harvest is disposed of in land fill or could be beneficially reused agriculturally (with approval) • Materials maintenance and storage will be undertaken at Tomerong
Location(s)	<ul style="list-style-type: none"> • The aquaculture lease is located in Jervis Bay adjacent to Collingwood beach, between the existing leases • Land based activity would occur at Tomerong as currently occurs
Time frame	<ul style="list-style-type: none"> • Transition from swing mooring to longline aquaculture would occur during the first season post approval • Expansion of mussel aquaculture to full extent would occur over three further seasons • Introduction of secondary species would commence in second season and develop according to establishment and success