

# **Commercial Shellfish Aquaculture Leases Jervis Bay, NSW**

## **Environmental Management Plan**

**Prepared By:** Sam Gordon & Anni Conn, South Coast Mariculture

**Prepared for:** NSW Department of Planning and Environment

**2020/10**

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## LIST OF ABBREVIATIONS

BACI	Before, After, Control, Impact
CMA	Catchment Management Authority
DGRs	Director-General’s Requirements
EIS	Environmental Impact Statement
EMP	Environmental Management Plan
EPA	Environmental Protection Authority
EP&A Act	Environmental Planning and Assessment Act (1979)
FM Act	New South Wales Fisheries Management Act (1994)
GIS	Geographic Information Systems
IALA	International Association of Lighthouse Authorities
JBMP	Jervis Bay Marine Park
KTP	Key Threatening Process
LGA	Local Government Area
MSDS	Material Safety Data Sheet
NPWS	National Parks and Wildlife Service
NSW DPI	New South Wales Department of Primary Industries
NSW DPIE	New South Wales Department of Planning, Industry & Environment
NSW EES	New South Wales Department of Environment, Energy and Science
NSW OEH	New South Wales Office of Environment and Heritage
NSW TSC Act	New South Wales Threatened Species Conservation Act (1995)

TfNSW	Transport for New South Wales
POEO Act	Protection of the Environment Operations Act (1997)
PSFI	Port Stephens Fisheries Institute
SCM	South Coast Mariculture
SCMCAL	South Coast Mariculture Commercial Shellfish Aquaculture Leases
SWMS	Safe Work Method Statement
TMP	Traffic Management Plan
TOC	Total Organic Carbon
WH&S	Work Health and Safety



## 1 BACKGROUND

### 1.1 Introduction

The NSW Government recognises the need to develop sustainable and viable aquaculture. In November 2014, Fisheries NSW, a division of the NSW Department of Primary Industries (NSW DPI), obtained State Significant Infrastructure Approval SSI-5657 from the NSW Government Department of Planning and the Environment to establish three commercial extensive aquaculture leases totalling 50 Hectares within the marine embayment of Jervis Bay, NSW. The conditions of the approval stated that lease development must be initiated by November 2019.

South Coast Mariculture Pty Ltd (SCM) was successful in securing the approval from Fisheries NSW to develop these leases, and in 2018 obtained lease based aquaculture permit AP2554 from NSW DPI to culture a number of marine bivalve species on the leases. Marine Park permits will be obtained to undertake associated actions within the Jervis Bay Marine Park.

SCM has worked in close consultation with NSW DPI, local, state and federal government agencies, community groups, private enterprise and numerous other stakeholders to ensure that the planning, development, infrastructure deployment, operations and environmental management of the SCM commercial shellfish aquaculture lease/s (SCMCAL) meet the conditions of the SSI-5657 and that the development has a net positive impact for the environment, the local community and the Jervis Bay region.

Jervis Bay is one of only three marine embayments on the NSW coast that are suitable for extensive aquaculture. The other embayments are Port Stephens, which has an established edible oyster industry and Twofold Bay, which already has extensive Blue Mussel aquaculture (Joyce *et. al.*, 2010). The Jervis Bay leases will assist in providing food security during seasonal fluctuations that may affect Port Stephens and Twofold Bay.

The purpose of this Environmental Management Plan (EMP) is to identify the management measures aimed at preventing or minimising potential adverse environmental impacts arising from the operation of the SCMCAL. The EMP has also been developed to ensure compliance with environmental regulatory requirements.

The viability of the operation of the SCMCAL is dependent upon preserving the quality of the surrounding marine environment.

### 1.2 Project Description

#### 1.2.1 Project Description

The SCMCAL are located within the open marine embayment of Jervis Bay which is located on the south coast of NSW (Figure 1). Jervis Bay is approximately 180 km south of Sydney and 20 km southeast of Nowra - the region's largest town.



Figure 1: Regional map of Jervis Bay and the locations for the Commercial Shellfish Aquaculture Leases (Source: Fisheries NSW 2012)

The SCMCAL occupy a total area of 50 hectares consisting of the following:

- Callala Lease (north AL 15/001) - 20 hectares;
- Callala Lease (south AL 15/002) - 20 hectares; and
- Vincentia Lease (AL 15/003) - 10 hectares.

The Callala Leases (north and south) are located approximately 1.5 km and 1.9 km southeast of Callala Beach, respectively. The Vincentia Lease is approximately 660m north of Orion Beach in Vincentia.

The lease coordinates are:

- AL15/001 (Callala North) - 20 hectares (Coordinates: -35° 1' 11.899" 150° 42' 39.666"; -35° 1' 27.615" 150° 42' 53.655"; -35° 1' 33.944" 150° 42' 43.147"; -35° 1' 18.228" 150° 42' 29.158");
- AL15/002 (Callala South) - 20 hectares (Coordinates: -35° 1' 38.188" 150° 42' 21.156"; -35° 1' 53.796" 150° 42' 35.324"; -35° 2' 0.206" 150° 42' 24.887"; -35° 1' 44.597", -150° 42' 10.720"); and
- AL15/003 (Vincentia) - 10 hectares (Coordinates: -35° 3' 35.483" 150° 41' 13.244"; -35° 3' 42.122" 150° 41' 21.910"; -35° 3' 49.960" 150° 41' 13.027"; -35° 3' 43.321" 150° 41' 4.361").

The leases are located in a Habitat Protection Zone of the JBMP which is a multiple use zone that caters for a wide range of sustainable activities. The aquaculture lease activities of extensive aquaculture of shellfish on longlines is currently permissible

within this zone. The Vincentia Lease is located over one of the former mussel aquaculture leases that was active between 1979 and 2008.

### 1.2.2 *Structure Design*

The SCMCAL infrastructure consists of longline culture systems which will include an anchoring and mooring system that is connected to backbone lines from which culturing apparatus would be suspended.

The anchoring and mooring system will consist of 6m anchors at each end of the system connected to lengths of chain and polypropylene hard lay UV stabilised rope (25-35 mm diameter) which would be connected to the main backbone rope of similar dimensions (Figure 2).

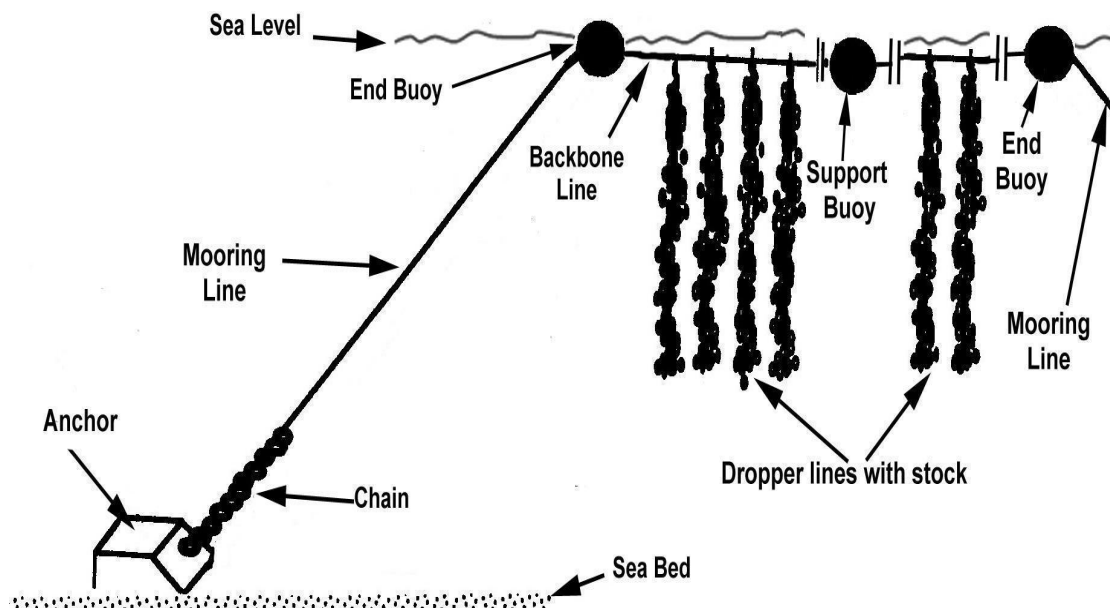


Figure 2: A schematic diagram of the type of longline infrastructure that SCM will be deploying on the leases for blue mussel culture (Source: Fisheries NSW, 2012)

The apparatus used to culture the shellfish will vary depending on the species cultured and may include:

- Dropper lines which are lengths of specially manufactured rope that enables certain shellfish species to adhere to them. Dropper lines can also be continuous where they are looped along the backbone in a continuous line;
- Pyramid nets and/or cages which are meshed containers in the shape of a pyramid in which the cultured stock are contained (Figure 3).
- Pocketed panel nets are generally a rectangular shaped structure which has a mesh like structure consisting of a number of “pockets” in which stock are placed for culture (Figure 3).
- Lantern nets and/or cages which are cylindrical shaped apparatus with an outer cover of mesh and a number of cross-sectional layers in which the stock are placed for culture (Figure 3); and

- Baskets or trays which are generally constructed from plastic mesh and are available in a range of shapes and sizes. This apparatus is commonly used for the intertidal culture of oysters.

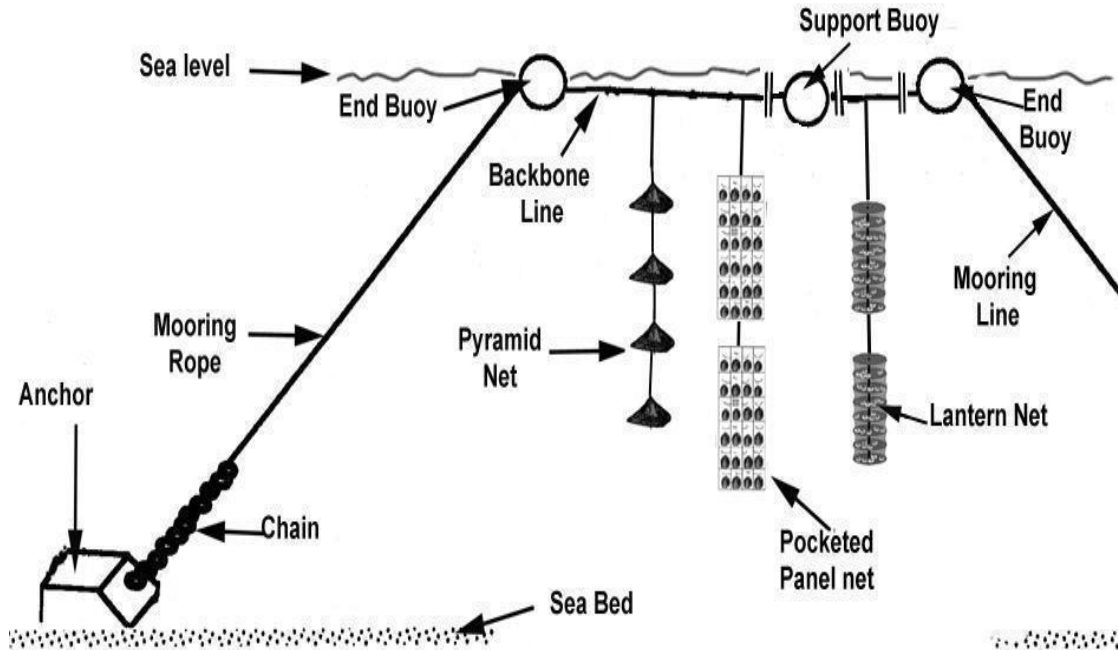


Figure 3: A schematic of a longline system and cages typically used for shellfish culture (Source: Fisheries NSW, 2012)

Buoys will be attached to the longlines to assist with supporting the system. The number of buoys used along each longline will vary depending on the growth stage of the stock and the need to secure cultured stock at an appropriate depth off the seabed away from potential predators. The number of surface buoys will not exceed that outlined in State Significant Infrastructure Approval (SSI-5657), conditions B7 & B8. The buoys are usually positioned 20-30 m apart when stocked with juveniles and as the crop increases in biomass additional buoys may be placed along the longlines. The support buoys generally have a volume of 150-200 litres (800mm in diameter or less as per SSI-5657 approval condition C4) and will be either black or grey in colour depending on the lease, in accordance with SSI-5657 approval condition C6. Floatation from the buoys combined with the anchors and chains would also assist with the maintenance of taut ropes to prevent marine fauna entanglement.

At least four navigation buoys will be positioned on the corners of the SCMCAL in accordance with the requirements of Transport for New South Wales (TfNSW)

### 1.2.3 Supply of Shellfish Stock

Shellfish spat for culture will be either naturally wild caught or produced at authorised industry hatchery facilities depending on the species. Hatchery produced stock will originate from locally collected brood-stock or if unavailable, brood-stock will be sourced from other localities, but individuals will be from the same genetic population. During the hatchery stage shellfish will be monitored for diseases and parasites and inspected prior to transportation to the leases.

The shellfish stock will rely on naturally occurring plankton and other nutrients in the waters of Jervis Bay for their feed. The species to be cultured, age of the stock and the water temperature will determine the standing biomass.

#### 1.2.4 Construction Activities

Most of the longline infrastructure will be prefabricated on land and then transported by vessels to the site for assemblage and installation. The construction/installation stage will consist of the following activities:

Installation of the anchors for the navigation buoys;

- Fitting of the mooring lines of the navigation buoys to the anchors;
- Installation of the anchors for the longline system;
- Fitting of the longlines to the mooring lines; and
- Fitting of the floatation buoys to the longline system.

The installation of the anchors, navigation buoys and longlines is anticipated to be undertaken during daylight hours during calm sea state conditions. Construction works outside these hours may be necessary to complete critical installations to ensure structural integrity and associated maritime safety. The installation of the longline system and navigation buoys will be undertaken from marine vessels suitable for heavy lifting and the placement of the anchors, supporting dive personnel and transportation of staff and equipment. An application for a Marine Park permit was submitted for Minister's consent to allow works in a habitat protection zone, aquaculture in a habitat protection zone, place a mooring, allow mooring or anchoring of vessels and install an unattended floating structure. The permit was issued on 14<sup>th</sup> January 2019 (MEAA18/43)

#### 1.2.5 Operational Activities

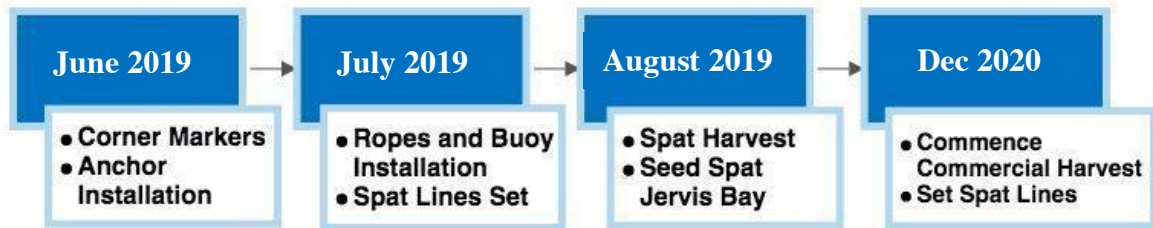
The operational stage will comprise of the following activities:

- Maintenance of the longline system and navigation buoys;
- Collecting data for monitoring programs;
- Stock husbandry; and
- Stock harvesting.

### 1.2.6 Timeline for Commercialisation

#### **Stage 1 – Pilot Commercialisation**

Pilot Commercialisation to test the viability of culturing mussels in Jervis Bay at lease site AL15/001 Callala North.



During the pilot commercialisation, navigational markers (comply with the IALA Buoyage System) lit to one nautical mile will be deployed to delineate the lease area. During the pilot phase, between eight and twenty 210m single backbone lines will be set across the lease site at Callala North.

Transport for New South Wales (TfNSW) were notified by email 20.3.19 of the final lease coordinates. The lease sites in Jervis Bay have been surveyed by Set Consultants.

#### **Milestones**

1. Verify growth rates and product quality. Demonstrate the marine leases in Jervis Bay can grow a mussel comparable with mussels commercially grown in Tasmania and Eden. Due Date 01/10/2019
2. Verify survival of mussel spat trans located from under the new DPI Protocol and project completion.

Confirm feasibility of NSW DPI new procedure to transport mussel spat from Eden to Jervis Bay on a commercial scale including road freight. Due 01/10/2019

3. Verify an average mussel yield per linear metre and project completion. Marketable mussel average yield >6kg per linear metre. Due 31/05/2020

#### **Stage 2 – Full Commercialisation**

Full commercialisation of the three leases in Jervis Bay and lease in Eden and the construction of a land-based processing facility at Huskisson. Full commercialisation will happen in stages dependent upon market access and financial factors.

The operators support the principle of poly culture as a way to mitigate risk, improve profitability and productivity and environmental outcomes. The operators intend to utilise the 10ha Vincentia lease in Jervis Bay to conduct trials for the culture of other

approved species working with research and development agencies. SCM has committed 1% of invoiced sales towards R&D.

When fully developed the SCMCAL are expected to produce 1500t of saleable mussels with an estimated value of >\$9Mil pa.

#### ***1.2.7 Decommissioning Activities (if required)***

If for any reason the decommissioning of the lease/s is required at any time it will include:

- Removal of any remaining stock from the longline infrastructure;
- Removal of culture apparatus and the return to suitable land-based facilities for disposal or sale;
- Removal of longline backbone and floats from the mooring lines and return to land-based facilities for disposal or sale;
- Removal of mooring lines from the anchors and return to land-based facilities for disposal or sale;
- Removal of the anchors and return to land-based facilities for disposal or sale; and
- Removal of all navigation marks/buoys and associated anchors.

#### ***1.3 Environmental Management Plan - Context***

This EMP has been developed to provide clear direction on the implementation of environmental management best practices during the construction/installation, operation and, if required, decommissioning stages of the SCMCAL.

A number of environmental management requirements associated with the proposed marine aquaculture leases are likely to be identified in the development application consent and/or are requirements associated with licences or other approvals required in the operation of the SCMCAL. The EMP also ensures that the SCMCAL do not have a significant impact on the marine environment, surrounding communities or SCM staff.

#### ***1.4 Environmental Management Plan - Objectives***

The objectives of the EMP are to ensure that the SCMCAL are managed sustainably and that their operation is consistent with the management rules of the marine park objects of the habitat protection zone and does not result in a significant impact on the marine environment, surrounding communities or staff.

The purpose of the management plans, monitoring programs and protocols described in this EMP are to:

- Ensure that aquaculture best practices are employed during the construction, operation and, if required, decommissioning stages of the SCMCAL;
- Minimise marine fauna interactions;
- Maintain water quality for both humans and the marine communities;
- Maintain the structural integrity and stability of the longline infrastructure;

- Mitigate the occurrence of diseases, parasites, and pests and provide prompt management and/or remedial action if these events occur;
- Ensure the safety of staff and surrounding communities;
- Ensure waste is appropriately disposed of;
- Maintain navigational safety in Jervis Bay; and
- Evaluate the performance of the SCMCAL by reviewing environmental management and monitoring records.
- Ensure compliance with SSI-5657 approval conditions.

## 2 STRATEGIC FRAMEWORK FOR ENVIRONMENTAL MANAGEMENT

### 2.1 Structure and Responsibility

South Coast Mariculture Pty Ltd has obtained an aquaculture permit (AP 2554) to authorise their activities on the SCMCAL. Figure 4 provides a generic organisational structure of personnel during the operation stage of the proposed leases.

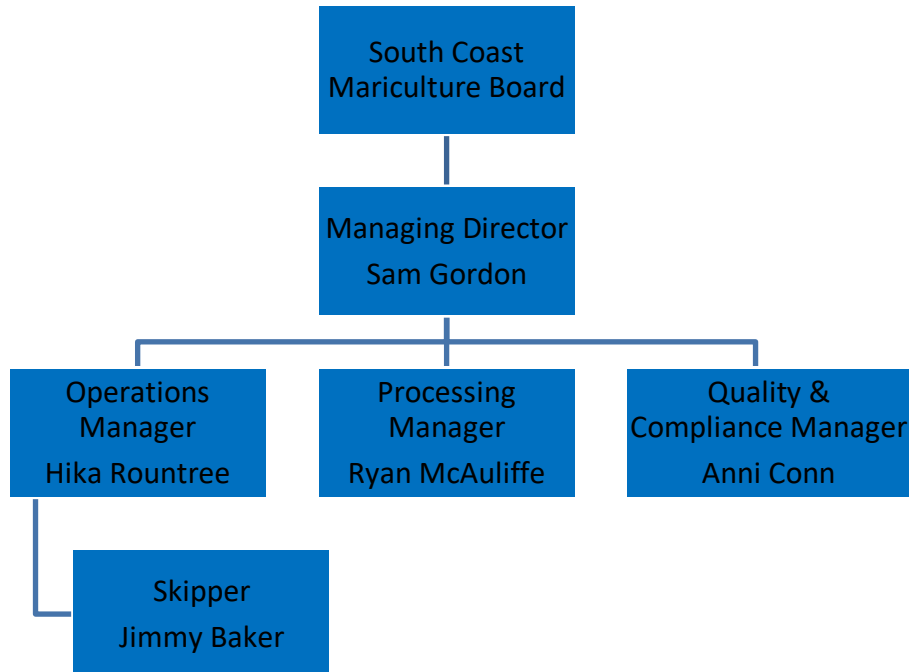


Figure 4: Organisational structure of personnel involved in the operation stage of the Commercial Shellfish Aquaculture Leases

In accordance with line management, the staff of the lease operator/s will have specific environmental management responsibilities as follows:

#### **Permit Holder South Coast Mariculture**

- Ensure that adequate resources are available to enable compliance with the requirements of the SSI-5657 approval and this EMP during the construction/installation, operation and, if required, decommissioning stages of the lease/s;
- Ensure that the operation of the lease/s does not have a significant impact on the environment and complies with NSW environmental statutory requirements;



- Maintain official communications about the lease/s with the relevant environmental regulators e.g. NSW DPI, Fisheries NSW and NSW EPA.; and
- Participate in environmental audits of the leases and take preventative and corrective actions as necessary.

### ***Operations Manager***

- Ensure that all personnel are aware of the requirements of the EMP, as well as undergo appropriate training (including competency-based assessment) and supervision relative to their areas of responsibility in order to be able to comply with the relevant requirements of the SSI-5657 approval and EMP;
- Plan environmental monitoring and reporting activities;
- Advise personnel on environmental best practices during all stages;
- Monitor compliance with the NSW environmental statutory requirements, regulatory approval conditions, the SSI-5657 approval and the EMP; and
- Record and review environmental incidents and community complaints and ensure that the most appropriate corrective and preventive actions are implemented in accordance with the SCM EMP Appendix 2 Community Stakeholder Communications Management Plan.
- Supervise the installation and operation of the leases to ensure compliance with the SSI-5657 approval, EMP and statutory requirements;
- Supervise environmental audits/inspections of the leases in accordance with the EMP;
- Ensure that the environmental management plans, monitoring programs, protocols and other mitigation measures are implemented and are achieving their objectives;
- Provide advice to staff and contractors on the EMP; and
- Participate in environmental audits of the leases, report non-conformance and take preventive and corrective actions as necessary.

### ***Skipper and Lease Staff***

- Comply with the EMP and statutory requirements under the direction of the Leading Hand and other personnel authorised by the Permit Holder; and
- Participate in environmental audits of the lease/s, report non-conformance and take preventive and corrective actions as necessary.

### ***Quality Assurance and Sustainability Manager***

- Oversee compliance of the Jervis Bay Shellfish Program and Benthic Monitoring Program *Contractors*
- Comply with the EMP and statutory requirements under the direction of the Leading Hand and other personnel authorised by the Permit Holder; and
- Participate in environmental audits of the lease/s, report non-conformance and take preventive and corrective actions as necessary.

## **2.2 Statutory Framework, Licenses and Approvals**

### **2.2.1 Relevant State Legislation**

#### **Environmental Planning and Assessment Act 1979 No. 203 (EP&A Act)**

The EP&A Act is administered by NSW Department of Planning, Industry and Environment (NSW DPIE) and provides for various planning instruments including State Environmental Planning Policies and Local Environment Plans, as well as specifying which types of developments require development approval.

Under the State Environmental Planning Policy (State and Regional Development 2011) this proposal is classified as State Significant Infrastructure (c.14 (1)(b) and Schedule 3 (1)(1)) and requires approval from the Minister for Planning and Infrastructure under s.115W of the EP&A Act.

*Biodiversity Conservation Act 2016 No. 63 (BC Act)*

The BC Act is administered by NSW Department of Planning, Industry and Environment and includes provisions to declare and protect threatened species, populations and ecological communities.

An assessment of significance on all threatened species that may occur in the area of the proposed development has been carried out. (NSW DPI, Fisheries, 2013)

*Biosecurity Act 2015*

The Biosecurity Act is administered by the NSW Department of Primary Industries (DPI). This Act covers the management of diseases and pests that may cause harm to human, animal or plant health or the environment.

The proposed SCMCAL operations will meet NSW Fisheries biosecurity regulations covering stock movement notifications and procedures and management of interstate vessel ballast water.

*Fisheries Management Act 1994 No. 38 (FM Act)*

Provisions for the protection of fish and marine vegetation are administered by Fisheries NSW under the FM Act.

An aquaculture lease issued under Section 163 of the FM Act is required for the proposed project. The activities will also be authorised under an aquaculture permit issued under Section 144(1) of the FM Act.

*Marine Estate Management Act 2014 No. 72 (MEM Act), Marine Estate Management Regulation 2017 & Marine Estate Management (Management Rules) Regulation 1999*

Provisions for the protection of marine biological diversity, marine habitats and ecological processes in marine parks, as well as ecologically sustainable resource use are administered by NSW DPI under the MP Act.

All three lease areas are located in the Habitat Protection Zone within Jervis Bay Marine Park (JBMP).

Aquaculture is a permissible use in the Habitat Protection Zone with the approval of the relevant Ministers and subject to the provisions of the zoning plan and management rules for the marine park.. Currently, only culture of extensive longline

shellfish is permissible in the Jervis Bay Marine Park in accordance with Part 3, Division 3 s.3.7 of the Marine Estate Management (Management Rules) Regulation 1999. A permit in accordance with Part 1, Division 2, Subdivision 3 Section 1.18 of the regulations will be required to undertake the proposed activity.

*National Parks and Wildlife Act 1974 No. 80 (NPW Act) and the National Parks and Wildlife Regulation 2019 (NPWR)*

Under the NPW Act, the Director-General of the NPWS is responsible for the care, control and management of all national parks, historic sites, nature reserves, reserves, Aboriginal areas and State game reserves. State conservation areas, reserves and regional parks are also administered under the NPW Act. The Director-General is also responsible under this legislation for the protection and care of native fauna and flora, and Aboriginal places and objects throughout NSW. The NPW Act and the NPWR are administered by the NSW Department of Environment, Energy and Science (EES).

*Crown Land Management Act 2016 No. 58*

Submerged land is generally classified as a type of Crown land. Submerged land includes most coastal estuaries, many large riverbeds, many wetlands and the State's territorial waters, which extend 3 nautical miles (5.5 km) out to sea.

The proposed area for the SCMCAL is located on submerged Crown land and therefore the landowner's consent through NSW DPI Catchments and Lands (Crown Lands Division) was required to lodge the EIS. (NSW DPI, Fisheries. 2013)

*Coastal Management Act 2016 No. 20 (CM Act)*

Under the CM Act, the proposed SCMCAL are in the coastal zone as defined by Section 4 of the Act. However, in accordance with Section 37B of the CM Act the area of the leases do not require the concurrence of the Minister administering the CM Act. The CM Act is administered by NSW Department of Environment, Energy and Science (EES).

*Heritage Act 1977 No. 136*

Under Section 51 of the Heritage Act 1977, a permit is required to move, damage, or destroy any historic shipwreck. The Heritage Act 1977 does not apply to State waters that are waters to which the Commonwealths Historic Shipwrecks Act 1976 applies. Heritage NSW is responsible for administering this Act.

*Marine Safety Act 1998 No. 121 (MS Act)*

The MS Act, administered by NSW Roads and Maritime Services, sets out a range of authorisations for a variety of works in and adjacent to navigable waters. Notification under Section 13Z of the MS Act to grant an aquaculture lease under Part 6 of the FM Act is also required.

*State Environmental Planning Policy (Coastal Management) 2018 (CM SEPP)*

The State Environmental Planning Policy (Coastal Management) 2018 (CM SEPP) implements the objectives of the Coastal Management Act 2016 (the CM Act) from a land use planning perspective, by specifying how development proposals are to be assessed if they fall within the coastal zone. The CM SEPP identifies development

controls for consent authorities to apply to each coastal management area to achieve the objectives of the CM Act. The CM SEPP establishes the approval pathway for coastal protection works.

Aboriginal Land Rights Act 1983 No. 42 (ALR Act)

The ALR Act, administered by the Office of the Registrar, provides a mechanism for compensating Aboriginal people of NSW for loss of their land. The proposed SCMCAL do not grant exclusive use.

Protection of Environment Operations Act 1997 (POEO Act)

The POEO Act, administered by the NSW EPA, ultimately aims to protect, enhance and restore the quality of the environment in NSW, to reduce risk to human health and promote mechanisms that minimise environmental degradation through a strong set of provisions and offences.

A licence is required from NSW EPA if any of the activities associated with the proposal are determined to be a Scheduled Activity under Schedule 1 of the Act. Longline aquaculture is not considered to be a Scheduled Activity and an EPA licence will not be required for the proposed SCMCAL.

Environmentally Hazardous Chemicals Act 1985 No. 14 (EHC Act)

The EHC Act, administered by NSW EPA, governs the use and disposal of potentially hazardous chemicals and waste material. Any use and/or removal of hazardous chemicals and material defined under the EHC Act require licensing and must be appropriately declared. At this stage it is not expected that any hazardous chemicals will be used.

Food Act 2003 No. 43

The Food Act 2003 is administered by the NSW Food Authority with the object of ensuring food for sale is both safe and suitable for human consumption. A Food Authority Licence under the Food Regulation 2010 will be required for shellfish cultured for human consumption.

2.2.2 Relevant Commonwealth Legislation

Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)

The EPBC Act is administered by the Department of Agriculture, Water and Environment (DoAWE).

The proposed development is required to be assessed according to the EPBC Act, the EPBC Act Policy Statement 1.1 (Significant Impacts Guideline: SIG 1.1) and the EPBC Act Policy Statement 2.2 (Offshore Aquaculture).

Fisheries NSW submitted a Referral of Proposed Action form to DoAWE for assessment under the EPBC Act. DoAWE has advised that the proposed SCMCAL have been deemed to not be a controlled action under the EPBC Act. (NSW DPI 2013).

Control of Naval Waters Act 1918 No. 6 (CNW Act)

The CNW Act is administered by the Department of Defence and its purpose is to provide for the protection of installations and/or land owned or used by the Commonwealth for purposes related to the defence of the Commonwealth. Jervis Bay has been declared Naval Waters under the CNW Act and therefore approval to undertake the proposed SCMCAL development and activities is required from the Superintendent of Naval Waters. This approval from the Superintendent of Naval Waters has been granted.

Underwater Cultural Heritage Act 2018 No. 85 (UCH Act)

The UCH Act, administered by DSEWPaC, protects historic wrecks and relics in Commonwealth Waters, extending from below the low water mark to the edge of the continental shelf.

Native Title Act No. 110 1993

The Department of Families, Housing, Community Services and Indigenous Affairs (FaHCSIA) administers this Act. The proposed SCMCAL do not grant exclusive use and do not extinguish native title.

Policy on Ecologically Sustainable Development (ESD)

Australia's National Strategy for Ecologically Sustainable Development 1992 (NSED) defines ecologically sustainable development (ESD) as 'using, conserving and enhancing the community's resources so that ecological processes on which life depends are maintained and the total quality of life, now and in the future, can be increased'.

2.2.3 Licenses and approvals

A list of approvals and licences required and obtained for the operation of the SCMCAL is provided in Table 1.

<b>Regulatory Authority</b>	<b>Approval/Licence</b>
Minister for Planning	SSI-5657 approval for Jervis Bay Aquaculture Project. Issued 21/11/2014.

Fisheries NSW	<p>The following are administered under the <i>Fisheries Management Act 1994</i>:                  Class A Aquaculture Permit #AP2554 Issued 21/08/2018. Updated 23/02/2021.                  Permit administered under the Marine Estate Management (Management Rules) Regulations 1999. Marine Parks Permit MEAA18/43 Issued 14/01/2019                  Permit MEAA19/122 to undertake research activity in a marine park issued 20/06/19 to University of Newcastle to undertake monitoring of the lease areas and control sites in the marine park</p>
NSW Food Authority	<p>Seafood Business Licence - #65400 Issued 21/02/2020. Updated 23/02/2021.                  This is administered under the <i>Food Regulation 2010</i>.</p>
Shoalhaven Council	<p>Land Based Facility DA Approval Issued 24/09/2020                  Executed Licence Huskisson Wharf Issued 12/12/2018</p>

Table 1: Approval and licensing requirements for the operation of the Commercial Shellfish Aquaculture Leases

#### 2.2.4 Limits of Approval

The SCM consent conditions SSI-5657, B6 through B10 include a set of specific limits of approval within which the SCMCAL must operate. These are listed below:

- B6. The approval will lapse 5 years after the date on which it is granted unless the deployment of the lease infrastructure commences before that.
- B7. A maximum of 150 surface support buoys are permitted to be deployed at Lease 1 (over a maximum area of 10 hectares) unless additional surface buoys are approved by the Secretary in accordance with Condition C7.
- B8. A maximum of 40 hectares in total of extensive aquaculture is permitted at Leases 2 and 3, including no more than 750 surface support buoys on each lease.

SCM shall ensure that the Leases are only stocked with the following species:

- Blue Mussels (*Mytilus galloprovincialis*)
- Scallops (*Pecten fumatus* and *Chlamys asperrima*)
- Akoya Pearl Oyster (*Pinctada imbricata*)

- Sydney Rock Oyster (*Saccostrea glomerata*)
- Angasi / Flat Oysters (*Ostrea angasi*)
- naturally occurring algae; and
- other species approved for by the Secretary for culture.

The hours for vessel movements on the Lease site(s) is restricted to daylight hours unless in response to emergency incidents, such as after severe weather or during deployment activities.

### 2.3 Reporting

The SSI-5657 approval outlines a number of reporting requirements. Table 2 below shows the SCM reporting schedule that will be followed in accordance with the consent conditions:

Report Type	Report Recipient/s	Report Content	Report Frequency
Annual Report	The Secretary, DPIE	a) identify the standards and performance measures that apply to the development b) describe the monitoring done over previous 12 months c) summarise complaints received during previous 12 months and trend complaints over preceding years d) include records of maintenance activities e) provide details of all monitoring results undertaken and an analysis of any trends, key findings or incidents involving threatened species and / or marine fauna f) identify any non-compliance during previous 12 months g) detail any navigational incident/s related to the operation of the development h) detail chemical use, diseases and / or introduced pests i) describe actions taken to ensure compliance	Annually – End of June
Incident Reporting	The Secretary, DPIE Other related	Notify of any incidents such as marine fauna entanglements / suspected	Within 24 hours of

	agencies	diseases / significant or unexplained mortality of cultured stock.	incident
Incident Report Follow Up	The Secretary, DPIE Other related agencies	Provide a written report that: a) describes the date, time and nature of the incident b) identifies the cause of the incident c) describes what action has been taken to date d) describes the proposed measures to address the incident	Within 6 days of incident
Regular Reporting	SCM Website	Provide regular reporting on the environmental performance of the project on the SCM website.	As per Condition E13 SSI-5657

Table 2: South Coast Mariculture reporting schedule

#### **2.4 Environmental Training**

Personnel employed on the SCMCAL are to receive appropriate training and must have the required skills and qualifications to fulfil their respective roles in a competent manner. Only contractors that meet the required training and competency requirements should be used on the leases.

Minimum environmental training will include:

- An induction onto the SCMCAL;
- Specialised environmental training and instruction required for undertaking allocated tasks;
- Other specific training and instruction requirements such as emergency response, biosecurity (diseases and pests) and operation of specific equipment; and
- Regular meetings which will include discussions on safety issues, risk assessments and controls.

#### **2.5 Emergency Contacts and Response**

SCM has developed an Emergency Protocol (Appendix 4) to enable prompt and effective responses to emergency situations. The emergency response plan includes qualified personnel, specific actions to be undertaken in response to different emergency situations, the reporting requirements and regular training.

SCM has established a contact number for the public to report any emergency events that will be available 24 hours a day, seven days a week. This number is: 1300 330 910

SCM will report all emergency situations and subsequent actions taken to DP&E through the Major Projects Website.

Emergency Contact List for SCM – See Attachment 7



## 2.6 Complaints Handling

Community complaints in relation to the operation of the SCMCAL will be recorded on a complaint register (Attachment 1) and will be reviewed by SCM to determine the most appropriate action.

SCM has established a hotline 1300 330 910 for the operation of the SCMCAL once the construction/installation stage commences, which will be listed in local papers and on the lease operators website [www.southcoastmariculture.com.au](http://www.southcoastmariculture.com.au).

## 3 POTENTIAL ENVIRONMENTAL IMPACTS

During the EIS process, NSW DPI identified, assessed, and categorised the potential environmental impacts of the proposed commercial shellfish aquaculture leases and ranked them in accordance with their risk rating. No issues were identified as representing a ‘high’ or ‘extreme’ risk but three were classified as ‘moderate’, including: (1) water quality and sedimentation; (2) genetics, disease and introduced pests; and (3) entanglement and ingestion of marine debris. The ‘moderate’ classifications indicate that these issues require further management and/or research. However, management responses to ‘moderate’ issues are unlikely to need to be immediate or drastic (de Jong & Tanner, 2004). Management responses will generally be in the nature of continuous improvements over the next 5 to 10 years to reduce the risk level to ‘low’ or ‘negligible’ (de Jong & Tanner, 2004).

The SCMCAL will provide researchers with an opportunity to investigate issues of concern, which will assist the NSW Government with gaining a greater understanding about the impacts of marine shellfish aquaculture and achieving sustainability without adversely impacting on the environment or local communities.

Table 3 provides a summary of the potential environmental issues associated with the proposed SCMCAL, as well as the risk ranking values recorded for each issue during the risk assessment.

Issue	Ranking
<b>Impacts on the Environment</b>	
Impacts on marine habitats – water quality and sedimentation	Moderate
Genetics of wild stocks, disease transmission (cultured stock to wild stock and other marine fauna), cultured stock diseases and introduced pests	Moderate
Impacts of artificial lights on fauna species	Negligible

Entanglement and ingestion of marine debris	Moderate
Risk of vessel strike and acoustic pollution	Low
Impacts on threatened and protected species	Low
Impacts on the behaviour of marine fauna including the creation of FADs	Low
Impacts on Areas of Conservation Significance - MPA, national parks and critical habitat	Low

Table 3: Summary of environmental issues including risk ranking values for the proposed Commercial Shellfish Aquaculture Leases (modified from NSW DPI 2013)

## 4 ENVIRONMENTAL MANAGEMENT

### 4.1 Environmental Management Plans

Table 4 outlines the environmental management measures that will be implemented by SCM to address environmental impacts of the operation of the SCMCAL.

Environmental Management Plan	Plan Objective/s	Relevant SSI-5657 Consent Condition	Appendix No.
Construction, Deployment and Traffic Management Plan	To identify and mitigate potential impacts associated with the construction, deployment and operational stages of the SCMCAL and the use of vehicles and vessels during these stages	C1	Appendix 1
Community Stakeholder Communications Management Plan	To identify relevant community and stakeholders and detail the communication and feedback strategy to be implemented.	E5	Appendix 2
Water Quality and Benthic	To assess and mitigate potential	D11 & D12	Appendix 3

Environment Monitoring Program	impacts of the SCMCAL on water quality and the benthic environment.		
Emergency Protocol	To outline contingency measures and procedures to be implemented in response to emergencies	E1	Appendix 4
Waste Management Plan	To ensure responsible waste management and disposal and mitigate pollution of the marine environment.	D13 & D14	Appendix 5
Marine Fauna Interaction Plan	To identify and mitigate potential impacts on marine fauna through direct and indirect interactions	D9	Appendix 6
Disease, Parasite & Pest Management Plan	To mitigate incursions and identify and mitigate potential impacts that may arise from disease, parasite or pest related matters	D5	Appendix 7

Table 4: Environmental management measures to be implemented by SCM

**4.1.1 Construction Deployment and Traffic Management Plan**

The Construction and Deployment Plan along with the Traffic Management Plan have been prepared as a combined document as the two matters are interrelated. The plan addresses consent condition C1.

The plan has been developed to identify and mitigate potential impacts associated with the construction, deployment and operational stages of the SCMCAL and the use

of vehicles and vessels during these stages. The Traffic Management Plan component also includes the daily operational traffic activities. (Appendix 1).

#### 4.1.2 Community Stakeholder Communications Management Plan

The Community Stakeholder Communication Plan identifies the relevant community and other stakeholders of the SCMCAL. It also details procedures and mechanisms used to inform the community of the developments progress and includes processes to receive and manage feedback and complaints. The plan addresses consent condition E5. (Appendix 2).

#### 4.1.3 Water Quality and Benthic Environment Monitoring Program

The Water Quality and Benthic Environment Monitoring Program (Appendix 3) has been developed to assess and mitigate potential impacts of the SCMCAL on water quality and the benthic environment. The Program includes the Water Quality Monitoring Program, the Macrobenthic Invertebrate Monitoring Program and the Substrate Monitoring Program and has been prepared as a combined document as the three programs are interrelated.

The Water Quality Monitoring Program has been developed in accordance with the NSW Food Authority and the NSW Shellfish Program (*see References for link*) and addresses consent condition D11. The Benthic Environment Monitoring Plan developed in accordance with consent condition D12 employs a similar experimental design to that used by the Centre for Research on Ecological Impacts of Coastal Cities (University of Sydney, NSW) to assess the ecological effects of mussel culture in Twofold Bay (Underwood & Hoskin 1999). These studies used a 'Before vs. After - Control vs. Impact' (BACI) sampling design, which is one means by which causality models can be rigorously tested in environmental investigations (Underwood, 1992; 1994). The use of multiple control sites coupled with multiple sampling times before and after the proposed activity enables an estimate of natural temporal and spatial variation of the environment to be obtained (Green, 1979). Such estimates can then be used to determine if impacts from the activity (i.e. the SCMCAL) cause greater variation in the environment than would occur naturally through time (Kingsford & Battershill, 1998).

The use of this type of sampling design was strongly advocated in the 1996 guidelines of the United Nations Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection (GESAMP) on monitoring the ecological effects of aquaculture (Hoskin & Underwood, 2001).

Fisheries NSW currently requires other marine based aquaculture (finfish and mussel farms) to undertake benthic environment monitoring using a BACI sampling design. In mid-2019, SCM contracted the University of Newcastle School of Environmental Science team to conduct a benthic survey of the SCMCAL prior to the stocking of the leases. The data from this survey will be used as baseline data against which all future benthic survey data will be compared. (Appendix 8, Jervis Bay Baseline Report, July

2019) The results from this and other benthic surveys will be included in the annual report.

#### **4.1.3.1**      *Water Quality Sampling*

Maintenance of water quality is critical to the health of the cultured stock and to ensure food safety of the product for human consumption.

The NSW Shellfish Program is a compulsory, industry funded program that assists in ensuring the public health safety of shellfish grown and harvested from NSW waters. The NSW Shellfish Program is administered by the NSW Food Authority under the *Food Act 2003*. The objective of the program is to protect the health of shellfish consumers through the administration and application of procedures described in the *New South Wales Shellfish Program Operations Manual* that:

- assess the risk of shellfish contamination by pathogenic bacteria and viruses, biotoxins and chemicals derived from the growing area;
- control the harvest of shellfish in accordance with the assessed risk; and
- protect shellfish from contamination after harvesting.

The program requires that shellfish producers undertake a water quality monitoring program to ensure the cultured shellfish are suitable for human consumption. An initial two-year monitoring period is required to determine the classification of Jervis Bay under the program.

The initial two-year monitoring period requires the collection of water samples both within and outside the leases with particular attention to location of potential pollution. It also has two distinct recognised water sampling strategies, systematic random sampling and significant rainfall event / pollution event sampling.

Systematic randomly sampling is to occur once a month to obtain a general picture of the water quality of Jervis Bay. Significant rainfall events and/or pollution event sampling attempts to quantify the threat that potential pollution sources may represent. Consequently, the timing of sample collection is important and should coincide with conditions when faecal pollution will be at its worst e.g. a creek which flows after rainfall or a sewage release event.

Significant rainfall events that need to be sampled are 10–19 mm, 20–30 mm and 40–60 mm within a 24-hour period. These samples are to be collected about 24 hours after the event and no later than 48 hours after the event.

During sampling data on the climatic conditions, water temperature, salinity and tide are collected. All collected water samples are then to be analysed by a NATA accredited laboratory for faecal coliform or *E. coli* counts. Biotoxin (algae) monitoring may also be required during the initial two-year monitoring period.

Once the classification of the water quality monitoring program for Jervis Bay is completed, the NSW Food Authority will then be in a position to develop any further

requirements for ongoing water quality monitoring program that may be required for the SCMCAL. SSI-5657 approval condition D11

#### 4.1.3.2 Benthic Sediment Sampling

The benthic environment beneath and surrounding the longline infrastructure will be monitored biologically (e.g. macrofauna abundance and species diversity) and chemically (i.e. organic matter and sediment composition) in accordance with SSI-5657 approval condition D12.

Frequency of benthic monitoring will be in accordance with the following schedule :

Benthic Survey Type	Season & Year	Lease Deployment Status
Baseline	Winter 2019	Pre-operational
Update 1	Winter 2020	Operational
Update 2	<i>Scheduled for Winter 2021 but delayed due to Covid 19 travel restrictions in NSW – survey will be conducted as soon as travel restrictions ease.</i>	Operational
Update 3	Winter 2022	Operational

Table 5: Benthic monitoring schedule

Results from benthic monitoring surveys will be published on the South Coast Mariculture website and included in the South Coast Mariculture Annual Environmental Management Report.

Sediment samples will be collected for determination of total organic carbon (TOC) and analysed using a simplified BACI sampling program similar to that outlined in Hoskin & Underwood (2001) and that currently required for other marine aquaculture activities in NSW.

Sites will be monitored within the lease/s and at two control sites. The control sites will be located at least 500 m from the lease/s boundary. Benthic samples (where possible) will be collected from under two longlines stocked with commercial densities of shellfish.

The distance of 500 m from the lease/s is considered to be sufficient for the control sites based on the results of previous studies on more intense nutrient producing activities such as sewage outfalls. A 10 ML daily discharge of secondary treated sewage for example, is generally limited to within 300 m of an outfall for the majority of variables (Smith, 1996; Smith, 2000). GPS coordinates of each site will be recorded so that subsequent sampling can be undertaken within the same area.

#### **Biological Monitoring**

Observing benthic fauna is a common environmental monitoring tool worldwide (de Jong & Tanner, 2004). Many studies have demonstrated that benthic fauna is a reliable

indicator of environmental changes that are induced by increased nutrient and sediment loads (Ritz *et al.*, 1990; Weston, 1990).

A range of factors that may affect the abundance and species diversity of macrofauna within Jervis Bay were identified from the literature, such as depth, sediment size, organic content of sediment, salinity, habitat type, temporal variation, temperature and nutrients (Table 6).

<b>Factor</b>	<b>Approach</b>
<b>Depth</b>	Controlled (5-10 m)
<b>Sediment size</b>	Controlled (sand and coarse sand)/measured
<b>Organic content of sediment</b>	Measured
<b>Salinity</b>	Controlled/measured (equivalent areas)
<b>Habitat type</b>	Controlled (all sand and coarse sand sediment)
<b>Temporal variation</b>	Small scale (animal activity) – Controlled (samples collected at same time of day) Medium scale (season) – Controlled (sites sampled in all seasons) Large scale (annually) – Controlled (sites sampled over two years)
<b>Temperature</b>	Measured
<b>Nutrients</b>	Measured (sediment samples)

Table 6: Important factors that may affect the abundance and species diversity of macrofauna within Jervis Bay and how this study may address them

Sediment samples may be collected by using hand-held corers or by using an appropriate sample grab. Macrofauna (animals less than 0.5 mm) will be extracted from the core samples by various methods which may include vigorously swirling the sediment in a container of water and magnesium chloride (a relaxant), and pouring floating animals onto a 0.5 mm sieve-mesh (Underwood & Hoskin, 1998). Remaining sediment may be examined for larger and heavier animals (e.g. gastropods and bivalves).

Identification and counting of macrofauna in each sample may be aided by staining the animals with Biebrich Scarlet and through the use of a dissecting microscope. Macrofauna will be identified to intermediate levels (i.e. class, order or family) and the measures of abundance and species diversity will be recorded. These two variables

have been chosen as they have been successfully used in many studies investigating the ecological effects of nutrient producing activities (e.g. sewage pollution) by the means of examining community structures (Underwood & Peterson 1988; Roper, 1990; Underwood & Chapman, 1995). Macrofauna samples will be preserved in buffered formalin in seawater (Underwood & Hoskin, 1999).

#### ***Chemical Assessment of Sediments***

Sediment samples may be collected using either hand-held corers or using a suitable grab sampler. The same sites and plots used to collect the cores for macrofauna analysis will be used to collect these samples. The cores of sediment will be refrigerated or frozen until analysed in order to prevent microbial degradation. The amount of carbon in the sediments will be estimated using appropriate analytical techniques by a NATA accredited laboratory.

Video and photo documentation of the seafloor beneath the longlines may also be used to assess the impacts of the SCMCAL on the benthic environment at various stages. Recovery rates following fallowing for example, may be assessed using this technique. These results will also be used to monitor and assess the impact of *in situ* cleaning of biofouling.

#### ***4.1.4 Emergency Protocol***

The Emergency Protocol (Appendix 4) addresses consent condition E1 and enables prompt and effective responses to emergency situations. The Emergency Protocol includes qualified personnel, specific actions to be undertaken in response to different emergency situations and reporting requirements.

The Emergency Protocol outlines contingency measures and procedures to be implemented to respond to emergencies, such as:

- Oil/ fuel or chemical spillage;
- Disease outbreak; and
- Mooring breach/ aids to navigation break-away.

If an emergency situation occurs during any stage of the SCMCAL, SCM will immediately implement the measures contained within the Emergency Protocol to mitigate the risks or impacts.

#### ***4.1.5 Waste Management Plan***

The Waste Management Plan (Appendix 5) has been developed in accordance with consent conditions D13 & D14 and will ensure responsible waste management and disposal including provisions for recycling materials and the disposal of wastes at approved disposal facilities. The plan also includes procedures on the handling and storage of wastes, including biological waste, general waste and worn infrastructure, as well as the provision of appropriate containers for storage and disposal, infrastructure maintenance and replacement cycles, cleaning and biofouling



management. Local government authorities, the Environment Protection Authority (EPA) are included in the plan.

#### 4.1.6 Marine Fauna Interaction Plan

The Marine Fauna Interaction Management Plan (Appendix 6) has been developed in accordance with consent condition D9 to identify and mitigate potential impacts on marine fauna through direct and indirect interactions. The plan will include the Marine Fauna Entanglement Avoidance Protocol (See Section 4.4.1) and the Observer Protocol (See Section 4.4.2).

#### 4.1.7 Disease, Parasite & Pest Management Plan

The longline infrastructure and the shellfish cultured may be exposed to a range of endemic diseases, parasites and pests. The Disease, Parasite and Pest Management Plan (Appendix 7) developed in accordance with consent conditions D5-8 outlines preventative measures (e.g. how to minimise stress to stock associated with stocking density, water quality and predatory interactions), inspection schedules (surveillance program), identification procedures, contact details of appropriate personnel to assist with the management of pathogens and treatments for stock and infrastructure (e.g. veterinary specialists).

SCM has carried out a desktop study on the potential pathogens and diseases of the blue mussel species, *Mytilus galloprovincialis*, which has concluded that there are currently no significant threats from pathogens and diseases. (Attachment 9 South Coast Mariculture Desktop Study of Mussel Pathogens and Disease Threats in Australia, 2019).

The Disease, Parasite and Pest Management Plan contains a number of guidelines and/or protocols to assist in dealing with disease, parasite and pest management issues including:

- Water quality monitoring;
- Biofouling management;
- Inspecting shellfish health;
- Steps to follow if a ‘declared disease’ is detected and/or unexplained mortalities;
- Emergency response in the unlikely event of a major disease outbreak event e.g. AQUAVETPLAN;
- Treatment procedures;
- Collecting samples for laboratory examination; and
- Maintenance of personnel and farm equipment hygiene.

Over time, inspections of stock for disease and parasites and scientific identification of these pathogens, will provide the SCM team with an opportunity to catalogue a listing of health threats which are a potential risk to cultured shellfish in NSW waters,

as well as contribute to the database on native pathogens of wild shellfish populations. Pathogen occurrence and the effectiveness of treatments, if required, will be documented in the annual environment report. Unusual and/or unidentifiable fouling organisms will also be documented, which may assist with early detection of declared diseases and pests, as well as improve the species inventory for native and/or introduced pathogens in NSW coastal waters. Any incidences of disease, parasites or pests will be reported in a daily work log (Attachment 6).

## **4.2 Environmental Management Support Plans**

### **4.2.1 Workplace Health and Safety Management Plan**

The on-going success of the SCMCAL relies on the competency and safety of lease personnel. Staff training to cover potential Work Health and Safety (WH&S) hazards including SCUBA diving, construction and deployment activities, service and maintenance activities, associated navigation issues, use and storage of chemicals (e.g. petrol), stock and the environment, as well as waste disposal.

Staff will be made aware of the environmental obligations of the SCMCAL by becoming familiar with and contributing to the review of the EMP. Staff will also be provided with relevant Safe Work Method Statements (SWMS) and Material Safety Data Sheets (MSDS) for any products that will be used on the SCMCAL. Staff will have qualifications appropriate to their positions and the tasks they are allocated. Contractors and subcontractors will be required to undertake an on-site induction and will be presented with relevant sections of the EMP to ensure compliance with the stated provisions.

SCUBA divers conducting any monitoring, maintenance and/or inspections for example, will comply with commercial diving standard and must be familiar with relevant SWMS and WH&S hazards prior to any diving activity. The WH&S plan will include information such as the qualifications and role responsibilities of diving personnel, first aid qualifications of diving personnel, procedures and equipment used during particular conditions, diving emergency procedures and contact details for NSW hyperbaric units.

### **4.2.2 Food Safety Plan**

Considerable quantities of stock for human consumption will be produced on the SCMCAL. To ensure that this stock is fit for human consumption an SQF 2000 Level III Quality Management System will be prepared to minimise the risk of hazards associated with the culturing of stock (e.g. monitoring water quality), as well as the handling and storage of stock to ensure adherence with NSW Food Authority regulatory requirements. The Quality Management System has been developed in accordance with Safe Quality Food (SQF) and the requirements of the *Seafood Safety Scheme* administered by NSW Food Authority under *Food Regulation 2010*.

## **4.3 Environmental Monitoring**

Environmental monitoring programs will detail procedures to monitor the marine lease environment for any adverse impact. These programs include assessment of

stock health, assessment of the structural integrity of the longline infrastructure, monitoring of marine fauna interactions, monitoring of water and meat quality and environmental impacts such as waste, noise and fuel leaks (See Table 7). SCM will also partner with the University of Newcastle School of Environmental Science team for the regular monitoring of the benthic flora, fauna and substrate matter under and around the leases.

The monitoring programs will also enable the effectiveness of mitigation measures to be evaluated which will be adapted if inadequate or more appropriate management options become apparent.

Issue	Monitoring Actions	Frequency	Responsibility
Noise	<ul style="list-style-type: none"> <li>▪ Noise assessments</li> <li>▪ Noise assessments in response to community complaints or working outside of normal hours</li> </ul>	<ul style="list-style-type: none"> <li>▪ During scheduled maintenance</li> </ul>	Lease/Permit Holder/s
Fuel leaks	<ul style="list-style-type: none"> <li>▪ Inspect vessels and onboard equipment to ensure no leaks</li> </ul>	<ul style="list-style-type: none"> <li>▪ Daily</li> <li>▪ During scheduled maintenance</li> </ul>	Lease/Permit Holder/s
Benthic environment	<ul style="list-style-type: none"> <li>▪ Collect benthic sediment samples before, during and after lease installation.</li> <li>▪ Monitor changes in sedimentation and benthic community structure</li> </ul>	<ul style="list-style-type: none"> <li>▪ Annually or as required in response to significant changes in sediment TOC levels</li> </ul>	Lease/Permit Holder/s
Water quality	<ul style="list-style-type: none"> <li>▪ Collect water samples in accordance with the NSW Shellfish Program</li> </ul>	<ul style="list-style-type: none"> <li>▪ As per NSW Shellfish Program Management Plan or in response to adverse event such as rainfall, algal bloom, peak season</li> </ul>	Jervis Bay Shellfish Program
Meat quality	<ul style="list-style-type: none"> <li>▪ Collect meat samples in accordance with the NSW Shellfish Program</li> </ul>	<ul style="list-style-type: none"> <li>▪ As per NSW Shellfish Program Management Plan (see Attachment 11) or in response to</li> </ul>	

		adverse event such as rainfall, algal bloom, peak season	
Marine fauna interactions	<ul style="list-style-type: none"> <li>▪ Investigate movements of high priority species within direct study area                             <ul style="list-style-type: none"> <li>○ Humpback and Southern Right Whales</li> </ul> </li> <li>▪ Record all observations of marine fauna interactions with infrastructure and vessels                             <ul style="list-style-type: none"> <li>○ Threatened &amp; protected species</li> <li>○ Boat strikes</li> <li>○ Behavioural changes</li> <li>○ Entanglements</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>▪ Daily when marine fauna are observed within lease areas.</li> </ul>	Lease/Permit Holder/s
Structural integrity and stability of infrastructure	<ul style="list-style-type: none"> <li>▪ Inspections and maintenance of longline infrastructure e.g. faults, damage, excessive biofouling and/or loose lines, or buoys</li> <li>▪ Monitoring the durability of infrastructure components</li> <li>▪ Monitor the effectiveness and suitability of the longline design                             <ul style="list-style-type: none"> <li>○ How frequently are repairs needed?</li> <li>○ Is tautness of lines being maintained?</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>▪ Daily – during harvesting. Weekly during non-harvest operations.</li> <li>▪ After severe weather</li> <li>▪ During biofouling cleaning</li> </ul>	Lease/Permit Holder/s
Navigation	<ul style="list-style-type: none"> <li>▪ Inspections of navigation marks for faults or damage</li> <li>▪ Record any navigation issues in daily work log</li> <li>▪ Regularly review observations, complaints and vessel incident reports</li> </ul>	<ul style="list-style-type: none"> <li>▪ Daily during harvesting. Weekly during non-harvest operations.</li> <li>▪ Review of navigation issues as they arise and in annual review.</li> </ul>	Lease/Permit Holder/s
Disease, parasites and pests	<ul style="list-style-type: none"> <li>▪ Regular inspections of stock for disease, parasites and pests to ensure early detection</li> </ul>	<ul style="list-style-type: none"> <li>▪ Daily inspection of harvested stock when processing.</li> </ul>	Lease/Permit Holder/s

	<ul style="list-style-type: none"> <li>▪ Regular inspection of longline infrastructure for pests to ensure early detection</li> <li>▪ Regular inspections to ensure early detection of the unlikely occurrence of ‘declared diseases’</li> <li>▪ Record diseases, parasites and pests - contribute to the species inventory for NSW waters</li> <li>▪ Record the occurrence of pathogens, the treatment details and their effectiveness</li> <li>▪ Monitor biofouling i.e. amount, composition and details of its removal</li> <li>▪ Regularly review the occurrences of pathogens and the effectiveness of treatments given to assess if management measures are appropriate and adequate or need to be improved</li> </ul>	<ul style="list-style-type: none"> <li>▪ Monthly visual inspections of stock on longlines (may be greater during periods of high-water temperature)</li> <li>▪ Removal of biofouling from buoys and ropes when lines are harvested.</li> <li>▪ Removal of biofouling from navigation buoys minimum quarterly.</li> </ul>	
Waste production and disposal	<ul style="list-style-type: none"> <li>▪ Regular inspection of waste storage containers</li> <li>▪ Record details about waste production and disposal                             <ul style="list-style-type: none"> <li>○ Bio waste e.g. biofouling cleaned from culture apparatus</li> <li>○ General waste</li> <li>○ Worn infrastructure</li> </ul> </li> <li>▪ Review waste production and disposal procedures</li> </ul>	<ul style="list-style-type: none"> <li>▪ Daily inspection and empty of waste storage containers</li> <li>▪ Daily removal of bio wastes when cleaning of biofouling from culture apparatus occurs</li> </ul>	Lease/Permit Holder/s

Table 7: Environmental monitoring proposed during the operation of the Commercial Shellfish Aquaculture Leases

#### 4.3.1 Structural Integrity and Stability Monitoring Program

The Structural Integrity and Stability Monitoring Program (Attachment 8) developed in accordance with consent condition C11 provides details on the procedures and schedules for inspections of the longline infrastructure to determine its structural integrity and stability. Evidence of faults, damage, excessive biofouling and loose lines or buoys will be the focus of the inspections which will be followed by appropriate maintenance. Inspections will be particularly important after severe weather, and the

cleaning of infrastructure in order to minimise marine fauna entanglements and navigation hazards.

Routine visual inspections will be undertaken at least every week with more detailed servicing inspections to be undertaken at least once a year and will cover all aspects of the infrastructure including anchors, ropes, chains and connectors. SCM will record items to be inspected, issues identified, and actions undertaken to rectify any structural integrity issues. For lease infrastructure management, SCM aims to deploy a cloud-based vessel and lease compliance / operational management tool through the Salesforce CRM software system which is targeted to be completed by mid 2021.

The Structural Integrity and Stability Monitoring Program will monitor the effectiveness and suitability of the infrastructure design, such as whether it adequately withstands the sea conditions in Jervis Bay, how frequently repairs are required and whether line tautness is being maintained.

#### **4.4 Environmental Management Protocols**

Environmental management protocols may be linked to one or more of the above environmental management sub-plans. The protocols will provide direction for reporting, assessment and management of the SCMCAL.

##### **4.4.1 Marine Fauna Entanglement Avoidance Protocol**

The Marine Fauna Entanglement Avoidance Protocol has been successfully used on other marine based aquaculture farms in NSW and was developed in consultation with NSW DPI and NSW EES. The protocol aims to minimise the threat of entanglement and entrapment of marine fauna in the longline infrastructure, as well as implement prompt and appropriate management if incidents occur in order to maximise successful releases and minimise injuries and stress to marine fauna.

All marine fauna interaction events will be recorded in the Marine Fauna Interaction/Observation Register (Attachment 2). In the event of an entanglement, an incident report detailing the time, location, species and the entanglement circumstances, will be prepared and provided to members of the Marine Fauna Interaction Committee and any other relevant authorities. For further details refer to Attachment 3 – Marine Fauna Entanglement Report Form and Attachment 4 – Entanglement Assessment Process.

The Marine Fauna Interaction Committee consists of the following personnel:

- Susan Crocetti (Team Leader, Marine Wildlife, Biodiversity and Wildlife Team)  
National Parks and Wildlife Service, NSW Department of Environment, Energy and Science.

- Andrew Marshall (Project Officer , Marine Wildlife, Biodiversity and Wildlife Team) National Parks and Wildlife Service, NSW Department of Environment, Energy and Science.
- Sam Davis, (Manager, Jervis Bay Marine Park) NSW Department of Primary Industries.
- Sam Gordon, (Director) South Coast Mariculture.
- Hika Rowntree (Operations Manager), South Coast Mariculture.
- Graeme Bowley (Senior Policy Officer, Aquaculture) NSW Department of Primary Industries.
- Dr Nick Otway (Senior Research Scientist (sharks)), NSW Department of Primary Industries.

See Table 8 for the contact details of the Marine Fauna Interaction Committee and additional entanglement respondent members. Other personnel with relevant expertise may join the committee as required to investigate specific matters.

<b>Representative</b>	<b>Position</b>	<b>Name</b>	<b>Contact details</b>
<b>South Coast Mariculture</b>	Managing Director	Sam Gordon	0400 224 823
<b>South Coast Mariculture</b>	Operations Manager	Hika Rountree	0419 242 604
<b>NPWS</b>	NPWS 24/7 contact		13000 PARKS (13000 72757)
<b>NPWS</b>	Marine Wildlife Team Leader	Susan Crocetti	T: (02) 6650 7114 M: 0403 125 807 E: Susan.crocetti@environment.nsw.gov.au
<b>NSW DPI – Jervis Bay Marine Park</b>	Manager	Sam Davis	T: 02 4428 3401 E: Jervis.bay@dpi.nsw.gov.au
<b>NSW DPI – Jervis Bay Marine Park</b>	Ranger	Marty Hing	T: 02 4428 3003 M: 0419 196 345 E: Marty.hing@dpi.nsw.gov.au

<b>NSW DPI - Fisheries</b>	Jervis Bay Marine Park Fisheries Officers	Mark Fackerell  Eddie Douglas	M: 0408 674 686 E: Mark.fackerell@dpi.nsw.gov.au  M: 0447 537 355 E: Eddie.douglas@dpi.nsw.gov.au
<b>NSW DPI - Fisheries</b>	Senior Research Scientist (sharks)	Nick Otway	T: 02 49163805 M: 0417 273 567 Nick.otway@dpi.nsw.gov.au
<b>NSW DPI - Fisheries</b>	Snr Policy Officer	Graeme Bowley	T: 02 4916 3845 M: 0438 264 039 E: Graeme.bowley@dpi.nsw.gov.au
<b>Transport for New South Wales</b>	Boating Safety Officer Jervis Bay	Mick Musson	M: 0427 751 857
<b>ORRCA (marine mammals)</b>			02 9415 3333
<b>Australian Seabird Rescue</b>			02 6686 2852 office 0428 862 852 rescue

Table 8: Listing of entanglement respondent members for South Coast Mariculture

There are a series of requirements that SCM must adhere to in order to comply with the Marine Fauna Entanglement Avoidance Protocol. Requirements and/or objectives of this protocol include:

- SCM will take all reasonable action to remedy, alleviate and reduce the incidence of marine fauna entanglements;
- SCM will conduct regular inspections of anchors, chains, ropes and buoys to ensure compliance with the ‘taut rope policy’ as the chance of entanglement is greatly reduced if culture equipment is kept taut and is correctly serviced. Regular inspections also promote early detection of entanglements and/or entrapments which increases the chance of successful release of marine fauna and minimises the chance of infrastructure damage;
  - Inspections of longline infrastructure will be conducted from Monday to Friday to ensure compliance with this policy.



- Rigid rope with a large diameter (not less than 25mm) will be used where practical to assist in the maintenance of taut ropes.
- Taut ropes and the rigidity of the longline infrastructure should ensure that large fauna (e.g. whales) do not become entangled on the unlikely occurrence that there is direct interaction.
- Servicing of the longline infrastructure must occur at least once a year.
- SCM will ensure that there are no loose ropes or other aquaculture gear on any component of the infrastructure;
- SCM will immediately notify relevant government agencies, including DPIE, DPI and EES if an entanglement incident occurs, including events where the entangled or entrapped animal may have been released (assisted or self-released);
- SCM will follow the response procedure outlined in the Marine Fauna Interaction Management Plan (Appendix 6) to deal with entanglement incidents in consultation with DPIE, DPI and EES and other relevant departments and organisations;
- SCM will ensure that a number of staff members receive regular training on wildlife rescue and rehabilitation techniques, as well as conduct response plan drills, to ensure appropriate responses to potential entanglement incidents. Drills should be conducted with the members of the rescue team;
- SCM will keep a copy of the protocol and the contact details of the entanglement committee members on all service vessels. In the event of an entanglement, the lease operator/s must provide assistance to the entanglement committee, including the rescue team, if required; and
- SCM will document any incidence of death or injury to marine fauna associated with the infrastructure and activities of the lease/s, including a statement of how the incident occurred and any action taken.

If marine fauna become entangled or entrapped, the main priority with is to assess their condition and determine the most appropriate and safe release method, as well as whether the animal needs to recuperate and further treatment under veterinary supervision (Attachment 4). In the unlikely event of deceased animals, the carcasses of dead marine fauna will be disposed of appropriately after consultation with the Entanglement Committee. The method of disposal will be determined largely by the size of the carcass. Some carcasses may be kept for scientific purposes (e.g. Australian Museum or other authorised research institutions). The Coordinator, Wildlife Management (NSW EES) will be contacted to ensure all relevant procedures have been carried out e.g. incident has been record in Marine Fauna Database.

An incident report detailing the time, location, species and the entanglement circumstances, will be prepared and presented to relevant authorities. The protocol and any incident reports will be periodically reviewed to identify any issues of concern or areas of inadequate management, as well as to enable modifications to be made based on field experiences and/or professional advice.

#### ***4.4.2 Observer Protocol***

The Observer Protocol aims to minimise adverse interactions between the SCMCAL, marine fauna and other waterway users. The Observer Protocol is a key component of the Marine Fauna Interaction Management Plan. Observers must be present during all vessel movements and lease/s activities to minimise the risk of boat strikes and navigational issues, as well as monitor marine fauna interactions. Appropriate distances from marine fauna will be maintained by lease/s service vessels.

Observations of marine fauna interactions with the lease/s and the service vessels will be recorded in the daily log or in the Marine Fauna Interaction/Observation Register (Attachment 2). Particular attention will be given to the movements of threatened and protected species, migratory species (e.g. humpback and southern right whales) as well as any boat strike incidences, behavioural changes, entanglements and predatory interactions. The protocol, daily log entries and any incident reports will be periodically reviewed to identify any issues of concern or areas of inadequate management, as well as contribute to the assessment of the impacts of the leases.

#### ***4.4.3 Support Buoy Protocol***

The Support Buoy Protocol aims to minimise potential visual amenity issues on the SCMCAL in accordance with SSI-5657 approval conditions C4-6. To minimise potential visual impacts SCM will ensure that:

- buoy numbers are kept to a minimum;
- floatation levels are balanced to minimise visibility whenever possible;
- cleaning of guano from buoys (if present); and
- excess buoys are to be removed from the lease when lines are not in use.

The above management actions to mitigate visual amenity issues will be recorded in the daily log. The protocol, daily log entries and any complaint reports will be periodically reviewed to identify any issues of concern or areas of inadequate management, as well as contribute to the assessment of the impacts of the leases.

#### **4.5 Environmental Reporting**

Environmental reporting requirements for the SCMCAL will include the following:

- Water and meat quality monitoring (as required by NSW Food Authority);
- Inspections of longline infrastructure (as required e.g. daily or weekly);
- Observations of marine fauna interactions (daily work log or Marine Fauna Interaction / Observer Register);
- Annual benthic monitoring report;
- Annual marine fauna interactions report;
- Annual navigation incidents report;

- Annual complaints report;
- Annual stock report (including a summary of disease, parasite and pest records);
- Annual WH&S report; and
- Annual structural integrity and stability report.

Checklists will be prepared and maintained by the lease operator/s for internal environmental audits (Attachment 5).

#### ***4.5.1 Logs and Registers***

A number of registers will be maintained by SCM as part of the operation of the leases. A summary of the matters within the registers will be included in the annual environmental management report in accordance with SSI-5657 approval condition E7. The registers will include but are not limited to the following:

##### ***Daily Work Log***

All activities associated with the operation of the SCMCAL are to be recorded in a daily works log which may include:

- General weather observations;
- Maintenance issues;
- Management actions undertaken;
- Records of staff and comments; and
- WH&S issues.

The daily work log may be used as an initial point for data collection prior to completing other logs or registers. As part of the environmental monitoring process, the daily work logs will be summarised and analysed fortnightly to ensure compliance with environmental management plans, monitoring programs and protocols.

##### ***Complaints Register***

A complaints register will be maintained by SCM (Attachment 1). The register will list information such as the following for each complaint:

- Date;
- Person/s receiving the complaint;
- Name, address, and contact phone number of person/s making the complaint;
- Specific details of the nature of the complaint; and
- Action undertaken in response to the complaint.

### ***Marine Fauna Interaction / Observer Register***

The Marine Fauna Interaction/Observer Register will list information such as the following (Attachment 2):

- Date;
- Time;
- Fauna species (if known);
- Number of individuals;
- Approximate size;
- Nature of interaction;
- Description of displayed behaviour;
- Photo/s if taken;
- Management issue; and
- Management actions.

### ***Marine Fauna Entanglement Report Form***

The Marine Fauna Entanglement Report Form (Attachment 3) captures the following information:

- Location & Time of Incident
- Observer Details
- Species Involved
- Description of Characteristics / Injuries
- Weather
- DPI and EES Officer Contacted
- Injuries to Animal
- Description of Entangling Gear

### ***Environmental Inspection Checklist***

This checklist supports regular (weekly) verification that monitoring is being implemented and that records are being taken.

### ***Environmental Audit Checklist***

This checklist supports validation that the Environmental Management Plan is being implemented and is effective.

### ***Water & Meat Quality Sampling Register***

This register will be in accordance with the requirements of the NSW Shellfish Program which is administered by the NSW Food Authority under the *Food Act 2003*. (Example Attachment 10)

#### 4.5.2 Management Reports - Moderate Risk Issues

Management reports will be completed for the three issues identified as representing a 'moderate' risk during the risk assessment, including:

- Water quality and sedimentation;
- Genetics, disease and introduced pests; and
- Entanglement and ingestion of marine debris.

The management reports will incorporate the guidelines provided in Fletcher *et al.* (2004), such as the use operational objectives, indicator levels, performance measures and/or limits, management responses, consideration of external factors that may have an impact, as well as regular evaluation of management, the robustness of indicators, limits etc and possible actions if limits were to become unacceptable.

## 5 REVIEW

### 5.1 *Annual Review*

An annual environment report will be completed in accordance with SSI-5657 approval condition E7 towards the end of each FY.

This annual report will include a Lease 1 Performance Review as per consent condition C7. This consists of the following requirements:

After 2 years of operation at a maximum of 150 buoys, SCM may apply to the Secretary for approval to increase the number of surface support buoys deployed at Lease 1. In seeking this approval, SCM shall prepare a Performance Review Report on Lease 1, which is to include:

- a) Justification for the need for additional surface support buoys, up to a maximum of 312;
- b) Demonstration that the lease would not expand (in area) from the approved 10 hectare site (as detailed in Appendix 1);
- c) Details of whether the mitigation measures detailed in C4, C5 and C6 are being implemented
- d) Details of consultation with key stakeholders including Council, MPA and Transport for New South Wales (TfNSW);
- e) An independent visual impact assessment including photographs of the existing lease infrastructure from a variety of viewpoints consistent with the O'Hanlon report;
- f) Details of the performance of the Lease as outlined in the Annual Report (Condition E7); and
- g) A review of any complaints and or vessel incidents.

Prior to the Operation of Leases 2 & 3, SCM will comply with the Transport for New South Wales (TfNSW) regarding the minimum number of buoys that shall remain in the water for each longline when they are not stocked. SCM will implement TfNSW's recommendations.

The aim of the report will be to assess environmental and socio-economic impacts of the SCMCAL, evaluate the effectiveness of mitigation, monitoring and management measures, and make modifications to the operation of the leases in accordance with the report findings. The annual environment report will consist of information such as the following:

- Annual water and benthic monitoring report;
- Non-compliance report and actions taken to meet compliance
- Annual marine fauna interaction/observations report;
- Annual navigation incidents report;
- Annual complaints report;
- Annual diseases, parasites and pests report;
- Annual WH&S report; and
- Annual structural integrity and stability report.

## **5.2 Environmental Auditing**

A program and procedures will be developed for the periodic auditing of the EMP's implementation and effectiveness. The audit will also provide information for the EMP's review in accordance with SSI-5657 approval condition E11. The audit program will cover both internal and external auditing requirements, including scope, methods and frequency, as well as the requirements and responsibilities for conducting the audits and reporting the results.

## 6 SSI – 5657 CONSENT CONDITIONS TABLE OF REFERENCE

The table below lists the SSI – 5657 Jervis Bay Shellfish Aquaculture Lease consent conditions and references the location in the EMP and Appended Sub Plans that the condition has been addressed.

Table 9: SSI – 5657 SCMCAL Consent Conditions and Reference Location in EMP and Appended Sub Plans

Condition	Location of Reference
<p><b>Condition E1 – Environmental Management Plan</b></p> <p>Prior to the commencement of operation, the Proponent shall revise and update the draft Environmental Management Plan (EMP), included with the RTS for the development to the satisfaction of the Secretary. The revised EMP is to include:</p> <ul style="list-style-type: none"> <li>(a) the strategic framework for environmental management of the development;</li> <li>(b) the statutory requirements that apply to the development;</li> <li>(c) the role, responsibility, authority, and accountability of all the key personnel involved in environmental management of the development;</li> <li>(d) the management measures that would be implemented to address environmental issues;</li> <li>(e) how the environmental performance of the development would be monitored and managed;</li> <li>(f) the procedures that would be implemented to respond to any non-compliances and emergencies including a contact number to report emergency events; and</li> </ul>	<p><b>The South Coast Mariculture Environmental Management Plan (EMP) plus Sub Plans – Appendices 1 to 7.</b></p> <ul style="list-style-type: none"> <li>a) Strategic framework is set out in Section 2.1.</li> <li>b) Statutory framework is set out in Section 2.2</li> <li>c) Roles and responsibility of key personnel are set out in Section 2.1.</li> <li>d) Management measures are set out in the individual management plans provided as appendices to the EMP, and briefly outlined in the EMP</li> <li>e) Environmental performance of the development would be managed through annual reporting and independent environmental audits, as set out in Section 2.3, monitoring of water quality &amp; the benthic environment is outlined in section 4.1.3, 4.3</li> <li>f) Procedures for non-compliances / incidences are set out in Section 2.3 and 2.6 and in the Emergency Protocol in Appendix 4. An emergency contact list is provided at Attachment 7. It is noted that the Planning Secretary must be notified of all incidents/emergencies in accordance with condition E8 and</li> </ul>

<p>(g) include copies of the various strategies and plans that are required under the development.</p>	<p>E9 of the approval.</p> <p>g) Copies of all plans have been provided as appendices to the EMP.</p>
<p><b>Condition</b></p>	<p><b>Location of Reference</b></p>
<p><b>Condition E2 – Management Plan Requirements</b></p> <p>The Proponent shall ensure that the Management Plans required under this approval are prepared in accordance with any relevant guidelines, and include:</p> <p>(a) detailed baseline data;</p> <p>(b) a description of:</p> <ul style="list-style-type: none"> <li>• the relevant statutory requirements (including any relevant approval, licence or lease conditions);</li> <li>• any relevant limits or performance measures/criteria; and</li> <li>• the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, the development or any management measures;</li> </ul> <p>(c) a description of the measures that will be implemented to comply with the relevant statutory requirements, limits, or performance measures/criteria;</p> <p>(d) a program to monitor and report on the:</p> <ul style="list-style-type: none"> <li>• impacts and environmental performance of the development; and</li> <li>• effectiveness of any management measures (see € above);</li> </ul> <p>(e) a program to investigate and implement ways to improve the</p>	<p><b>The South Coast Mariculture EMP and attachments covers this requirement.</b></p>



<p>environmental performance of the development over time;</p> <p>(f) a protocol for managing and reporting any:</p> <ul style="list-style-type: none"> <li>• incidents;</li> <li>• complaints;</li> <li>• non-compliances with statutory requirements; and</li> <li>• exceedances of the impact assessment criteria and/or performance criteria; and</li> </ul> <p>(g) a protocol for periodic review of the plan.</p>	
<b>Condition</b>	<b>Location of Reference</b>
<p><b>Condition C1 – Deployment of Lease Infrastructure</b></p> <p>The Proponent shall prepare and implement a Construction and Deployment Environmental Management Plan, to the satisfaction of the Secretary. The plan must be prepared in consultation with Council and any other relevant stakeholders, and:</p> <p>(a) be approved by the Secretary at least one month prior to deployment;</p> <p>(b) include details of the species to be farmed;</p> <p>(c) include detailed plans of infrastructure to be used at each of the proposed Leases, including the final lease layout and mooring plans, and include maximum number, type and colour of buoys to be used at each Lease site;</p> <p>(d) detail all reasonable and feasible design measures used to minimise the potential visual impact of the development from Callala Beach and Vincentia (including orientation);</p> <p>(e) detail the location of the land-based site(s) (if any) for the construction or storage of Lease Infrastructure and indicative timeframe for all deployment activities;</p>	<p><b>Appendix 1 - Construction Deployment and Traffic Management Plan.</b></p> <p>a) The plan has been submitted to the Secretary for approval.</p> <p>b) Species to be farmed are outlined in Section 2. These align with the approved list of species in the approval.</p> <p>c) Detailed plans of infrastructure to be used are provided in Section 6.</p> <p>d) A qualitative commentary around measures to be implemented to minimise visual impacts is provided in Section 8.</p> <p>e) Details of land-based sites are provided at Section 3. Timetable for deployment is provided at Section 4.</p> <p>f) Details on traffic, noise and waste management are provided at Section 5.</p> <p>g) A Community Stakeholder Communication Management Plan (<b>Appendix 2</b>) has been prepared to provide the mechanisms for disseminating information during operation. An outline of communication tools is</p>

<p>(f) include if necessary, details on traffic, noise and waste management;</p> <p>(g) describe the procedures that would be implemented to keep the local community and relevant agencies informed about construction/deployment activities; and procedures to receive and handle complaints; and describe the procedures to decommission any construction site including removal of all construction facilities and restoration of the site to its original state.</p>	<p>provided in Section 10. Details of complaints management is at Section 12.</p> <p>h) Decommissioning is outlined in Section 13.</p>
Condition	Location of Reference
<p><b>Condition C11 – Structural Integrity and Stability Monitoring Program</b></p> <p>The Proponent shall prepare and implement a Structural Integrity and Stability Monitoring Program, prior to deployment and to the satisfaction of the Secretary. The Program shall include but not be limited to:</p> <p>a) weekly monitoring including an inspection checklist to investigate the effectiveness of the infrastructure design, including how often repairs are made and whether line tautness is being maintained; and</p> <p>b) details of servicing requirements of anchors, ropes, chains and connectors. Servicing must be undertaken at least annually;</p> <p>c) details of actions that would be undertaken to rectify any structural integrity issues, particularly in the event that infrastructure breaks away from the Leases after storm events.</p>	<p><b>A Structural Integrity and Stability Monitoring Program is provided in Attachment 8 of the South Coast Mariculture EMP</b></p> <p>a) A monitoring schedule is provided at Table A of Attachment 8.</p> <p>b) Details of servicing requirements are provided in Table A.</p> <p>c) Actions to rectify structural integrity issues are outlined in Table B.</p>
Condition	Location of Reference

<p><b>Condition D5 – Disease, Parasite and Pest Management Plan</b></p> <p>a) The Proponent shall prepare a Disease, Parasite and Pest Management Plan in accordance with the Draft EMP, to assist in the identification and treatment of potential diseases, parasites and pests.</p> <p>b) The Plan shall include details on the monitoring of the health of cultured stock and inspection of longline infrastructure to identify any disease or parasite issues that may arise.</p>	<p><b>Appendix 7 – Disease, Parasite and Pest Management Plan</b></p> <p>a) Details on the monitoring of the health of cultured stock are provided at Section 4 Hatchery.</p> <p>b) Details on the inspection of longline infrastructure to identify any disease or parasite issues are provided at Section 5 including details of the removal and harvest of diseased and dead stock is provided at Section 6.</p>
<p><b>Condition</b></p>	<p><b>Location of Reference</b></p>
<p><b>Condition D9 – Marine Fauna Interaction Management Plan</b></p> <p>The Proponent shall finalise and implement the Marine Fauna Interaction Management Plan detailed in the Draft EMP prior to the commencement of operation, to the satisfaction of the Secretary. The Plan shall detail measures to remedy, alleviate and reduce the incidence of marine fauna entanglements. The Marine Fauna Interaction Management Plan shall include:</p> <p>a) procedures for the recording of all observations of marine fauna interactions with the lease areas including longlines and vessels, as outlined in the EIS and the RTS;</p> <p>b) contact details of an Entanglement Committee, which would monitor the implementation and effectiveness of the Marine Fauna Interaction Management Plan, and provide advice to the Proponent in the unlikely event of marine fauna entanglement with the Lease infrastructure; and</p> <p>c) response procedures, drills and training that would be carried out to ensure appropriate responses to deal with entanglement incidences.</p>	<p><b>Appendix 6 - Marine Fauna Interaction Management Plan</b></p> <p>a) Procedures for the recording of all observations of marine fauna interactions are outlined in the Observer Protocol in Section 3.</p> <p>b) Contact details for the Entanglement Committee are provided at Table 1 in Section 4.</p> <p>c) Training and response are outlined in Section 4.2.</p>

Condition	Location of Reference
<p><b>Condition D12 – Benthic Monitoring Program</b></p> <p>The Proponent shall prepare and submit a Benthic Monitoring Program, to the satisfaction of the Secretary within 6 months of the date of this approval. The Program shall include but not necessarily be limited to:</p> <ul style="list-style-type: none"> <li>a) representative background monitoring to establish baseline conditions for the Leases, including benthic fauna and TOC parameters, for a suitable time period;</li> <li>b) the use of multiple control sites and identification of the frequency of sampling to ensure the monitoring program is spatially and statistically meaningful;</li> <li>c) collecting data at least annually after the Leases are approved, irrespective of whether the Leases are stocked with shellfish;</li> <li>d) a minimum monitoring period of at least three years from the commencement of operation;</li> <li>e) identification of trigger(s) and ameliorative measures (including video surveys) in the event that adverse impacts to benthic fauna relevant to the development are identified;</li> <li>f) identify triggers that would decrease monitoring efforts; and</li> <li>g) reporting of the monitoring results to the Secretary and EES annually within the Annual Report, including commentary on any effects of the Leases compared to relevant guidelines, pre-lease sampling or control sites.</li> </ul>	<p><b>Appendix 3 - Water Quality and Benthic Environment Monitoring Program</b></p> <ul style="list-style-type: none"> <li>a) Representative background monitoring for benthic fauna and TOC conditions is described in Section 3. Baseline sampling will be carried out before stocking and then annually for a minimum of 3 years.</li> <li>b) South Coast Mariculture uses a BACI (Before After Control Impact) approach to monitoring. Six control sites have been identified. A sampling design is outlined in Table 1.</li> <li>c) Section 3.1.4 confirms the sampling will occur prior to installation of the leases and at least annually after the lease is granted, irrespective of whether the lease is stocked with shellfish.</li> <li>d) Baseline sampling will be carried out before stocking and then sampling will be carried out annually for a minimum of 3 years</li> <li>e) Section 3.1.6 and Section 3.2.6 note that if any ‘significant changes’ to the marine benthic environment are identified, then appropriate management regimes will be employed to ameliorate these impacts (e.g. destocking or fallowing). ROV survey and footage is proposed to be used.</li> <li>f) Section 3.2.6 states that monitoring efforts would be decreased if no significant long-term impacts have been identified.</li> <li>g) Commitment to report monitoring results in the Annual Report is detailed in Section 2.5</li> </ul>

Condition	Location of Reference
<p><b>Condition D14 – Waste Management Plan</b></p> <p>The Proponent shall develop a Waste Management Plan prior to the commencement of operation, to the satisfaction of the Secretary. The plan is to include measures to ensure that:</p> <ul style="list-style-type: none"> <li>(a) all waste including biofouling is appropriately stored, handled and disposed of in a timely manner;</li> <li>(b) waste generated by the project is minimised;</li> <li>(c) details of where all waste would be stored; and</li> <li>(d) all waste generated by the Project is classified in accordance with the EPA's Waste Classification Guidelines and disposed of to a facility that may lawfully accept the waste.</li> </ul>	<p><b>Appendix 5 - Waste Management Plan</b></p> <ul style="list-style-type: none"> <li>a) Measures to ensure waste is appropriately stored, handled and disposed of are detailed in Section 3.</li> <li>b) Minimisation of waste generated is outlined in Section 4.</li> <li>c) Section 3 outlines how waste will be collected and disposed.</li> <li>d) Wastes have been classified and disposal destinations identified for each waste type in Table 1 in Section 2.</li> </ul>
Condition	Location of Reference
<p><b>Condition E5 – Community Stakeholder Plan</b></p> <p>The Proponent shall prepare and implement a Community Stakeholder Plan for the development to the satisfaction of the Secretary. This plan must be approved by the Secretary prior to commencement of deployment, and include:</p> <ul style="list-style-type: none"> <li>(a) identification of all relevant community and other stakeholders;</li> <li>(b) details of procedures and mechanisms used to inform the community (including local aboriginal communities) and stakeholders of the development's progress and potential employment opportunities;</li> <li>(c) processes to receive and manage feedback and complaints; and</li> </ul>	<p><b>Appendix 2 - Community and Stakeholder Communications Management Plan</b></p> <ul style="list-style-type: none"> <li>a) A list of community and other stakeholders is provided at Section 2.</li> <li>b) Details of procedures to inform the community are outlined in Section 3.</li> <li>c) Feedback and complaints processes are outlined in Section 4.</li> <li>d) Contact details are provided in Section 5 and Section 6, including a 24-hour contact number.</li> </ul>

(d) phone, email and mail contact details for the development, including a 24-hour contact number.	
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## 7 EMP & SUB PLAN DOCUMENT CONTROL

### SSI – 5657 Jervis Bay Shellfish Aquaculture Lease Environmental Management Plan and Sub Plans Document Control Register

<b>Environmental Management Plan</b>						
<b>Version Number</b>	<b>Date Issued</b>	<b>Date Submitted to Department</b>	<b>Date Reviewed by Department</b>	<b>Revisions Requested by Department or other stakeholders</b>	<b>Comments</b>	<b>Version Approved by Department</b>
1	October 2020	22 June 2021	June / July 2021	Yes	Assessed by NSW EES and NSW Fisheries	Revisions required
2	July 2021	29 July 2021	August 2021	Yes	Assessed by NSW EES, NSW Fisheries and NSW Marine Parks	Revisions required
3	September 2021	11 September 2021	September 2021			

<b>Appendix 1 – Construction, Deployment and Traffic Management Plan</b>						
<b>Version Number</b>	<b>Date Issued</b>	<b>Date Submitted to Department</b>	<b>Date Reviewed by Department</b>	<b>Revisions Requested by Department or other stakeholders</b>	<b>Comments</b>	<b>Version Approved by Department</b>
1	October 2020	22 June 2021	June / July 2021	Yes	Assessed by NSW EES and NSW Fisheries	Revisions required
2	July 2021	29 July 2021	August 2021	Yes	Assessed by NSW EES, NSW Fisheries and NSW Marine Parks	Revisions required
3	August 2021	03 September 2021	September 2021			

<b>Appendix 2 – Community Stakeholder Communications Management Plan</b>						
<b>Version Number</b>	<b>Date Issued</b>	<b>Date Submitted to Department</b>	<b>Date Reviewed by Department</b>	<b>Revisions Requested by Department or other stakeholders</b>	<b>Comments</b>	<b>Version Approved by Department</b>
1	October 2020	22 June 2021	June / July 2021	Yes	Assessed by NSW EES and NSW Fisheries	Revisions required
2	July 2021	29 July 2021	August 2021	Yes	Assessed by NSW EES, NSW Fisheries and NSW Marine Parks	Revisions required
3	August 2021	03 September 2021	September 2021			



<b>Appendix 3 – Water Quality and Benthic Environment Monitoring Program</b>						
<b>Version Number</b>	<b>Date Issued</b>	<b>Date Submitted to Department</b>	<b>Date Reviewed by Department</b>	<b>Revisions Requested by Department or other stakeholders</b>	<b>Comments</b>	<b>Version Approved by Department</b>
1	October 2020	22 June 2021	June / July 2021	Yes	Assessed by NSW EES and NSW Fisheries	Revisions required
2	July 2021	29 July 2021	August 2021	Yes	Assessed by NSW EES, NSW Fisheries and NSW Marine Parks	Revisions required
3	August 2021	03 September 2021	September 2021			

<b>Appendix 4 – Emergency Protocol</b>						
<b>Version Number</b>	<b>Date Issued</b>	<b>Date Submitted to Department</b>	<b>Date Reviewed by Department</b>	<b>Revisions Requested by Department or other stakeholders</b>	<b>Comments</b>	<b>Version Approved by Department</b>
1	October 2020	22 June 2021	June / July 2021	Yes	Assessed by NSW EES and NSW Fisheries	Revisions required
2	July 2021	29 July 2021	August 2021	Yes	Assessed by NSW EES, NSW Fisheries and NSW Marine Parks	Revisions required
3	August 2021	03 September 2021	September 2021			

<b>Appendix 5 – Waste Management Plan</b>						
<b>Version Number</b>	<b>Date Issued</b>	<b>Date Submitted to Department</b>	<b>Date Reviewed by Department</b>	<b>Revisions Requested by Department or other stakeholders</b>	<b>Comments</b>	<b>Version Approved by Department</b>
1	October 2020	22 June 2021	June / July 2021	Yes	Assessed by NSW EES and NSW Fisheries	Revisions required
2	July 2021	29 July 2021	August 2021	Yes	Assessed by NSW EES, NSW Fisheries and NSW Marine Parks	Revisions required
3	August 2021	03 September 2021	September 2021			

<b>Appendix 6 – Marine Fauna Interaction Plan</b>						
<b>Version Number</b>	<b>Date Issued</b>	<b>Date Submitted to Department</b>	<b>Date Reviewed by Department</b>	<b>Revisions Requested by Department or other stakeholders</b>	<b>Comments</b>	<b>Version Approved by Department</b>
1	October 2020	22 June 2021	June / July 2021	Yes	Assessed by NSW EES and NSW Fisheries	Revisions required
2	July 2021	29 July 2021	August 2021	Yes	Assessed by NSW EES, NSW Fisheries and NSW Marine Parks	Revisions required
3	August 2021	03 September 2021	September 2021			

<b>Appendix 7 – Disease, Parasite and Pest Management Plan</b>						
<b>Version Number</b>	<b>Date Issued</b>	<b>Date Submitted to Department</b>	<b>Date Reviewed by Department</b>	<b>Revisions Requested by Department or other stakeholders</b>	<b>Comments</b>	<b>Version Approved by Department</b>
1	October 2020	22 June 2021	June / July 2021	Yes	Assessed by NSW EES and NSW Fisheries	Revisions required
2	July 2021	29 July 2021	August 2021	Yes	Assessed by NSW EES, NSW Fisheries and NSW Marine Parks	Revisions required
3	August 2021	03 September 2021	September 2021			

Table 10: SCM EMP and Appended Sub Plans Document control register

## 8 REFERENCES

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## 9 ATTACHMENT 1 - COMPLAINTS REGISTER

No.	Date	Name	Contact details	Nature of complaint	Action taken

**10 ATTACHMENT 2 - MARINE FAUNA INTERACTION / OBSERVATION REGISTER**

Date	Time	Fauna Species	No. of individuals	Size	Photo Taken	Nature of interaction	Management issues	Management actions
					Y/N			

### 11 ATTACHMENT 3 - MARINE FAUNA ENTANGLEMENT REPORT FORM

	<b>Date:</b>	<b>Time:</b>
<b>Name of observer/s:</b>	<i>Location:</i> <i>Lat:</i> _____ <i>Long:</i> _____  <i>GPS ref:</i>	<i>Description of location:</i>
<b>Type of species (e.g. whale/dolphin/turtle /fish/bird):</b>	<i>Description of animal</i>	<i>Photo or Video taken (attach if taken)</i> Yes No
<b>Weather conditions:</b>	<i>Other animals present (e.g. sharks)</i>	<i>Animal alive?</i> Yes No
<b>Name of officer contacted (Heritage NSW or NSW DPI)</b> <b>Location:</b>	<i>Date:</i>	<i>Time:</i>

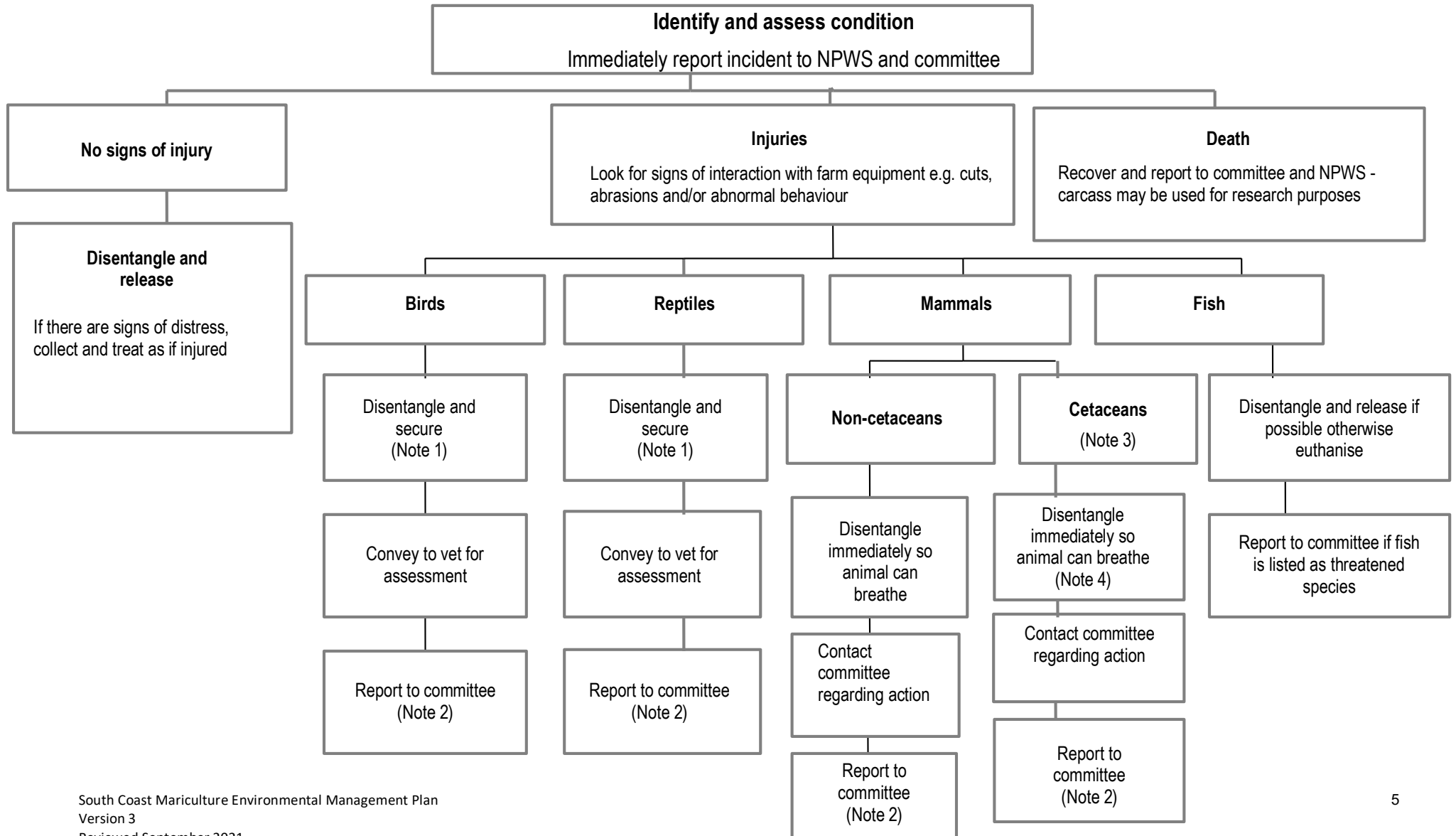
<p>Drawing showing distinct characteristics, injuries and entangling gear.</p>	<p>Describe the animal as you have seen it: colour, shape, size, marks, scars etc.</p> <p>Overall size: _____</p> <p>Head: _____</p> <p>Back (fin?): _____</p> <p>Tail: _____</p> <p>Flippers/fins: _____</p> <p>Other: _____</p>
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**Do not approach cetaceans within 100 metres**

<p>If animal left site, when was it last seen?</p>	<p>Describe the entangling gear: (net, rope, buoy, colour, trailing line)</p>	<p>Visible injuries? Yes No Scars? Yes No</p>
<p>If the animal dives, how long? How often?</p>		<p>Fresh blood? Yes No Where?</p>
<p>If moving, what speed and direction?</p>	<p>Where/how on the body? (head, tail, flippers, mouth)</p>	<p>Is the animal thin or emaciated?</p>



## 12 ATTACHMENT 4 - ENTANGLEMENT ASSESSMENT PROCESS



- Note 1:** Secure means hold animal in a dark warm container such as a plastic dive box or insulated bin. For reptiles, the bottom of the container needs to be padded.
- Note 2:** Report means prepare an incident report as detailed as possible stating all circumstances relating to the entanglement event including a veterinary report. The report will be submitted to the committee and relevant authorities.
- Note 3:** Cetaceans that are injured will have lacerations, irregular buoyancy and irregular swimming behaviour.
- Note 4:** When disentangling cetaceans need to be as gentle as possible, suspend in the water and do not handle if possible.

### 13 ATTACHMENT 5 - ENVIRONMENTAL INSPECTION CHECKLIST

<b>Date</b>	<b>Time</b>
<b>Inspection Officer:</b>	
<b>Stage:</b> Construction/Installation • Operation • Decommissioning •	

If answer 'No' - please provide comment.

Question		Yes	No	N/A	Comment
1	Are noise suppression measures adequate and effective?				
2	Are waste disposal containers adequately labelled and covered?				
3	Are good housekeeping/rubbish removal practices being used?				
4	Are navigation buoys and lights operating effectively?				
5	Check: Have personnel including contractors been made aware of environmental protection measures relevant to their respective work?				
6	Check: Is the Complaints Register up to date and is appropriately actioned?				
7	Check: Is the Marine Fauna Interactions/Observer register up to date and is appropriately actioned?				
8					
9					
10					
11					
12					

**Environmental Inspection Checklist**  
**Comments/Corrective Action required:**

Q No.	Detailed comment	Corrective action

Auditor Signature: \_\_\_\_\_

Corrective actions approved by Lease/Permit Holder as appropriate (if actions required).

Signature: \_\_\_\_\_

Date: \_\_\_\_/\_\_\_\_/202\_\_

## 14 ATTACHMENT 6 - ENVIRONMENTAL AUDIT CHECKLIST

<b>Date</b>	<b>Time</b>
<b>Inspection Officer:</b>	
<b>Research Stage:</b> Installation • Research • Decommissioning •	

If answer 'No' - please provide comment.

	<b>Question</b>	<b>Yes</b>	<b>No</b>	<b>N/A</b>	<b>Comment</b>
<b>1</b>	Is there good knowledge of the emergency response plans?				
<b>2</b>	Is the EMP current and up to date?				
<b>3</b>	Is the environmental monitoring plan effective?				
<b>4</b>	Are environmental incidents and community complaints being investigated and followed up appropriately?				
<b>5</b>	Are preventative and corrective actions being undertaken in an appropriate and timely manner?				
<b>6</b>	Are personnel aware of their responsibilities under the EMP?				
<b>7</b>	Are current waste management practices operating effectively?				
<b>8</b>	Are the current marine fauna interaction mitigation measures working effectively?				
<b>9</b>	Are the communication systems for environmental issues adequate and being adhered to?				
<b>10</b>	Is the frequency of environmental auditing sufficient and of good quality?				

<b>11</b>	Do the current environmental protection practices appear to be appropriate?				
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**Environmental Audit Checklist**

**Comments/Corrective Action required:**

Q No.	Detailed comment	Corrective action

Auditor Signature: \_\_\_\_\_

Corrective actions approved by Lease/Permit Holder as appropriate (if actions required).

Signature: \_\_\_\_\_ Date: \_\_\_\_/\_\_\_\_/\_\_\_\_

**15 ATTACHMENT 7 - EMERGENCY CONTACT LIST**

<b>Representative</b>	<b>Position</b>	<b>Name</b>	<b>Contact details</b>
South Coast Mariculture	24/7 contact number		0419 242 604
South Coast Mariculture	Operations Manager	Hika Rountree	0419 242 604 <a href="mailto:hika@southcoastmariculture.com.au">hika@southcoastmariculture.com.au</a>
NSW DPI Fisheries	District Fisheries Officer	Glenn Staples	0419185557 <a href="mailto:Glenn.staples@dpi.nsw.gov.au">Glenn.staples@dpi.nsw.gov.au</a>
Jervis Bay Marine Park	Snr. Marine Park Officer	Mark Fackerell	0408674686 <a href="mailto:Mark.fackerell@dpi.nsw.gov.au">Mark.fackerell@dpi.nsw.gov.au</a>
NSW Roads & Maritime (EPA)	Boating Officer	Mick Musson	0427751857
Shoalhaven City Council	Economic Development Officer	Greg Pullen	0412146056 <a href="mailto:Greg.Pullen@shoalhaven.nsw.gov.au">Greg.Pullen@shoalhaven.nsw.gov.au</a>
Navy (Jervis and Twofold bays)	Officer of the Day 24/7		0400468697
NPWS	Emerg. Fauna Response		State 98956444 South Coast 82751752
NSW Food Authority	24/7 number	Anthony Zammit	0407078269 <a href="mailto:anthony.zammit@dpi.nsw.gov.au">anthony.zammit@dpi.nsw.gov.au</a>
<b>Other</b>			
Navy	1st Lieutenant HMAS Creswell	Lt Comm. Jock McManus	02 44297901 - 0412218556 <a href="mailto:Rodney.mcmanus@defence.gov.au">Rodney.mcmanus@defence.gov.au</a>
Navy	Fleet Support Officer	Lt Bradley Doyle	02 44297134 0407659345
Navy	HMAS Creswell Port Services		0244297881 <a href="mailto:portservices.creswell@defence.gov.au">portservices.creswell@defence.gov.au</a>
NSW Dept. Planning and Environment	Notify in 24 hours		<a href="mailto:compliance@planning.nsw.gov.au">compliance@planning.nsw.gov.au</a>
Commonwealth	Notify first opportunity		<a href="mailto:EPBCmonitoring@environment.gov.au">EPBCmonitoring@environment.gov.au</a>
South Coast Mariculture	Lease/Permit Holder	Sam Gordon	0400224823 sgordon@southcoastmariculture.com.au
NSW DPI Fisheries	Policy Officer	Graeme Bowley	0438 264 039
Jervis Bay Marine Park	Manager	Matt Carr	0417041086





## 16 ATTACHMENT 8 - STRUCTURAL

### INTEGRITY AND STABILITY MONITORING PROGRAM

The following SCM Structural Integrity and Stability Monitoring Program has been developed in accordance with SSI-5657 consent condition C11. The program consists of a monitoring schedule and a corrective action procedure for inspections of the SCMCAL longline infrastructure to determine its structural integrity and stability.

Evidence of faults, damage, excessive biofouling and loose lines or buoys will be the focus of the inspections which will be followed by appropriate maintenance. Inspections will be particularly important after severe weather, and the cleaning of infrastructure in order to minimise marine fauna entanglements and navigation hazards.

Routine visual inspections will be undertaken at least every week with more detailed servicing inspections to be undertaken at least once a year and will cover all aspects of the infrastructure including anchors, ropes, chains and connectors. SCM will record items to be inspected, issues identified and actions undertaken to rectify any structural integrity issues using a cloud based vessel and lease compliance / operational management tool which will be implemented in mid 2021.

Table A below details the SCM Lease Infrastructure Monitoring Schedule, whilst Table B outlines the corrective action to be implemented in the event that a structural / stability issue is identified.

**Table A. South Coast Mariculture Lease Infrastructure Monitoring Schedule**

<b>Infrastructure Inspected</b>	<b>Frequency</b>	<b>Method of Inspection</b>	<b>Inspection / Maintenance Focus</b>
All surface observable lease infrastructure including: <ul style="list-style-type: none"> <li>▪ Floats</li> <li>▪ Lines</li> <li>▪ Cardinal Markers</li> </ul>	Daily / weekly and after severe weather.	Visual – vessel drives up and down lines	<ul style="list-style-type: none"> <li>▪ Loose, broken or missing floats</li> <li>▪ Loose or broken lines</li> <li>▪ Damage to Cardinal markers</li> <li>▪ Excessive biofouling</li> <li>▪ Unusual marine biofouling</li> </ul>
All surface and sub-surface lease infrastructure including:	Annually	Visual – equipment pulled up and inspected	<ul style="list-style-type: none"> <li>▪ Broken or damaged backbones,</li> <li>▪ Damaged or fouled anchor warps,</li> <li>▪ Damaged or missing line ties,</li> </ul>

<ul style="list-style-type: none"> <li>▪ Line backbones</li> <li>▪ Anchor warps</li> <li>▪ Line ties</li> <li>▪ Anchor blocks</li> <li>▪ Chains</li> </ul>			<ul style="list-style-type: none"> <li>▪ Damaged or fouled cardinal markers, anchor blocks and chains</li> </ul>
Cardinal markers and Callala beach	During and after severe weather	Visual – binocular scan of cardinal markers and beach from Callala beach	<ul style="list-style-type: none"> <li>▪ Damaged or missing cardinal markers,</li> <li>▪ Debris on the beach – washed up floats / lines.</li> </ul>

**Table B. South Coast Mariculture Lease Infrastructure Corrective Action Procedure**

<b>Structural / Stability Issue</b>	<b>Corrective Action</b>	<b>Mitigation Measures</b>	<b>Recording</b>
Damaged, broken or missing infrastructure	Replace infrastructure locate any missing infrastructure through e.g. beach patrols or other method	Frequent visual inspection of surface infrastructure. Thorough annual inspection of sub-surface infrastructure Current equipment under 10-year manufacturer’s warranty which expires in 2029. Age of infrastructure monitored.	Daily Log – if a corrective action is undertaken  Cloud based marine operation and compliance software
Biofouled Infrastructure	Biofouling removed safely. Harvest lines taken to shore and air dried for 2 weeks before being reused.	Frequent visual inspection and biofouling removal prior to build up.	Daily Log – if a corrective action is undertaken  Cloud based marine operation and compliance software
Unusual biofouling of infrastructure	Biofouling removed and photos and samples taken for analysis. Reference DPI booklet of invasive pests. Notify DPI if organisms is a known invasive pest	Frequent visual inspection of infrastructure and daily inspection of harvest lines.	Daily Log – if a corrective action is undertaken  Cloud based marine operation and compliance software

	or if it cannot be identified.		
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The Structural Integrity and Stability Monitoring Program will help to monitor the effectiveness and suitability of the infrastructure design, such as whether it adequately withstands the sea conditions in Jervis Bay, how frequently repairs are required and whether line tautness is being maintained.

## **17 ATTACHMENT 9 - DESKTOP STUDY OF MUSSEL PATHOGENS & DISEASE THREATS IN AUSTRALIA**

**1<sup>st</sup> May 2019**

### **Desktop Study of Mussel Pathogens and Disease Threats in Australia**

#### **Potential Pathogens**

##### **Asian green mussel / *Perna viridis***

Source: <https://www.dpi.nsw.gov.au/fishing/pests-diseases/marine-pests/found-in-australia/asian-green-mussel>

The Asian green mussel is a large bivalve attaining a size up to 16cm in length. Juveniles are typically bright green in colour, with the adults turning dark green to brown.

It is fast growing, can tolerate a wide range of water salinities and temperatures, and can be found in water depths of up to 42m. This mussel is capable of attaching to a variety of hard surfaces including vessels, buoys and aquaculture equipment often forming dense clumps.

The Asian green mussel can outcompete native species, but also has the potential if eaten to cause human-health impacts (shellfish poisoning).

#### **Key features:**

Bright green juvenile shell and dark green to brown adult shell

Commonly 8-10cm in length, can reach up to 16cm in length

Smooth pearly shell

Known locations:

Cairns, QLD

Not known to occur in NSW

#### **Habitat:**

Variety of hard surfaces, particularly floating, including vessels, wharves, buoys, intake pipes, aquaculture equipment

Low tide to 42m depth, lower estuarine habitats to marine

Tropical to warm waters but tolerates wide ranges of salinities and temperatures

#### **Impacts:**

Fast growing, out-competes native species

Forms dense clumps, fouls man-made structures

Accumulates toxins and is linked to shellfish poisoning in humans

#### **Diseases:**

Source: Australian Government Department of Agriculture, Fisheries and Forestry - Aquatic Animal Diseases Significant to Australia: Identification Field Guide 4th Edition Biosecurity AUGUST 2012

***Marteilia refringens*** (Also known as Aber disease, digestive gland disease or marteiliosis)

Presence in Australia EXOTIC DISEASE—not present in Australia.

Species known to be susceptible to infection with *M. refringens* includes:

Blue mussel *Mytilus galloprovincialis*

***Perkinsus marinus***

Presence in Australia EXOTIC DISEASE—not present in Australia

Species known to be susceptible to infection with *P. marinus* includes:

Blue mussel *Mytilus galloprovincialis*

Source: <https://vfa.vic.gov.au/operational-policy/moving-and-stocking-live-aquatic-organisms/protocol-for-the-translocation-of-blue-mussels>

There are international and national protocols concerning identification and notification for molluscan diseases (Anon 2003b, c). **To date, no notifiable diseases have been identified in Australian mussels.**

**Disease Risk 1 Identified - Translocation of hatchery mussel spat could transmit disease.**

*Suggested control for Risk 1:*

Implement hatchery disease testing protocol: All unexplained mussel mortality within the hatchery must be declared by the supplier. Spat will be tested histopathologically by a competent veterinary authority for the detection of infectious agents. Translocation permitted if there is no unexplained mortality and no diseases are detected.

**Disease Risk 2 Identified - Translocation of hatchery mussel spat could transmit marine pests.**

*Possible controls for Risk 2:*

To mitigate the possible contamination with Pacific oysters, the hatchery will need protocols and documentation to show separation of batches and equipment. A completed Hatchery Compliance Report will be required.

Only allow mussel translocation if toxic algae are below alert levels.

Source: Wayne O’Conner, NSW DPI

Email to Sam Gordon dated 1.4.19

Sam, I'm not aware of any disease outbreaks in mussels. Please find attached a report from NZ, which you may find useful. It does not point to specific threats in our context, but it does allow you to talk about what might be generic risks and how these will be controlled. For example. Bucephalid parasites do occur in scallops in Port Phillip Bay and have been recorded in *M. galloprovincialis*. However, these are parasites of adults (live in the gonad), they are already present in scallops in JB and are not vertically transmitted (adult to larvae), so you pose no risk.

Wayne O'Connor | Senior Principal Research Scientist | Research Leader Aquaculture  
| Institute Director  
Fisheries Research  
NSW Department of Primary Industries | Fisheries

Port Stephens Fisheries Institute | Taylors Beach | NSW 2316

**Conclusion**

We are unable to find any evidence of disease outbreaks in mussels in Australia or a specific threat from the translocation of mussel spat from Victorian or NSW Hatcheries to the marine leases in Jervis Bay, New South Wales.

**18 ATTACHMENT 10 - WATER / MEAT QUALITY SAMPLING REGISTER**

Hi Tide 5:33a  
Low tide 11:15am

ES 314675

**NSW SHELLFISH PROGRAM LABORATORY REQUEST FORM – ENVIRONMENTAL SAMPLES**

Local SP: Jervis Bay  
 Report Results To: Ann: Carr  
 Fax: accounts@shoalharvest.com.au Phone: 07 3058 4500  
 Copy Results & This Form To: NSW SP Phone: 1300 552 406 Fax: 02 9741 4896  
 Invoice to be sent to: accounts@southcoastmariculture.com.au

Routine Sample  Event Sample  Event Type   
 Comments: CLEAR & CALM  
ASL

Rainfall recorded during the previous period (mm)

0 - 24 hours	24 - 48 hours	48 - 72 hours	Total for previous week
0	0	10.6 mm	10.6 mm

**A. SAMPLE DETAILS**  
 Indicate sample type and testing required – ONE request form per species AND per test method

Shellfish  
**Oyster Species**  
 Sydney Rock  Pacific  Native  
 Mussel  
 Pipi  
 Other \_\_\_\_\_

**Test Method**  
 Biotoxin  
 ASP  DSP  NSP  PSP  
 E. coli Rapid Method (DPM) [AS 1766.2.12]  
 Other (Specify Test) \_\_\_\_\_

**OR**

Water  
 Faecal coliform MF [AS 4276.7]  
 Faecal coliform MPN [AS 4276.6]  
 Other (Specify Test) \_\_\_\_\_

Phytoplankton  full count  scan

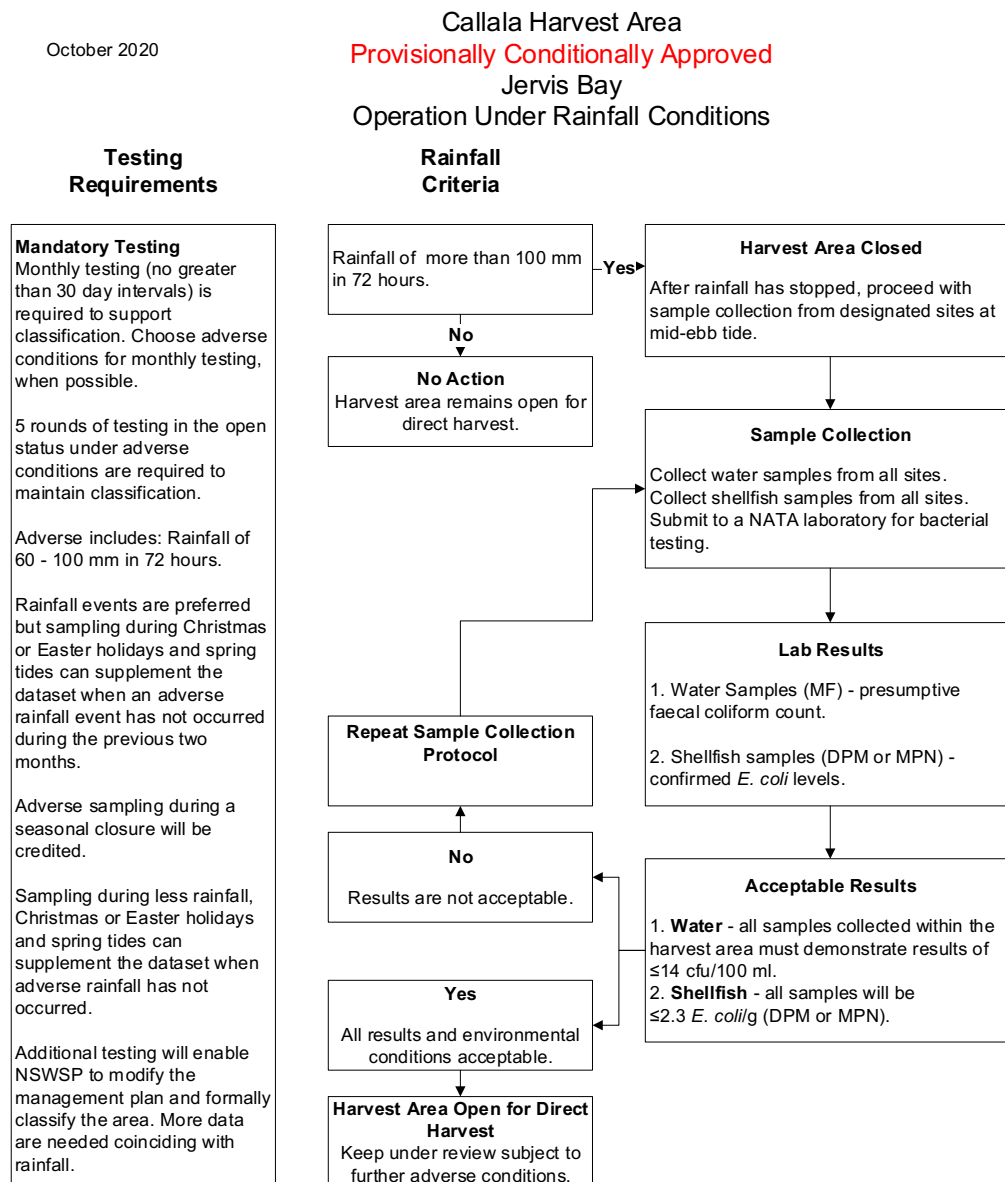
Harvest Area	Site No.	Lease No.	Date	Time	Density / Salinity	Temp (°C)	Tide	Comment (e.g. local activities & prevailing weather)
JERVIS BAY	1		14/9	8:45	36	15.81		Ax REL BOATS
"	2		"	8:58	36	15.83		
"	3		"	9:01	37	15.80		
"	4		"	9:19	37	15.74		
"	5		"	9:04	36	15.74		
"	6		"	9:08	36	15.71		
"	7		"	9:13	36	15.72		

**B. SAMPLER DETAILS**  
 Name: Hika Kantyga Approved Sampler No: 587 Date: 14/9/20  
 Signature\*: \_\_\_\_\_  
 \* I certify that correct sample collection procedures have been followed and all details recorded above are accurate.

OFFICE USE ONLY  
 Laboratory Job Number \_\_\_\_\_  
 Received at Laboratory (Date & Time) \_\_\_\_\_  
 (Please fax request form as submitted with samples with report to the NSW Shellfish Program)

NSW Shellfish Program PO Box 6682 Silverwater NSW 1811

## 19 ATTACHMENT 11 – NSW SHELLFISH PROGRAM CALLALA AND VINCENTIA LEASE MANAGEMENT PLANS AND SAMPLING POINTS



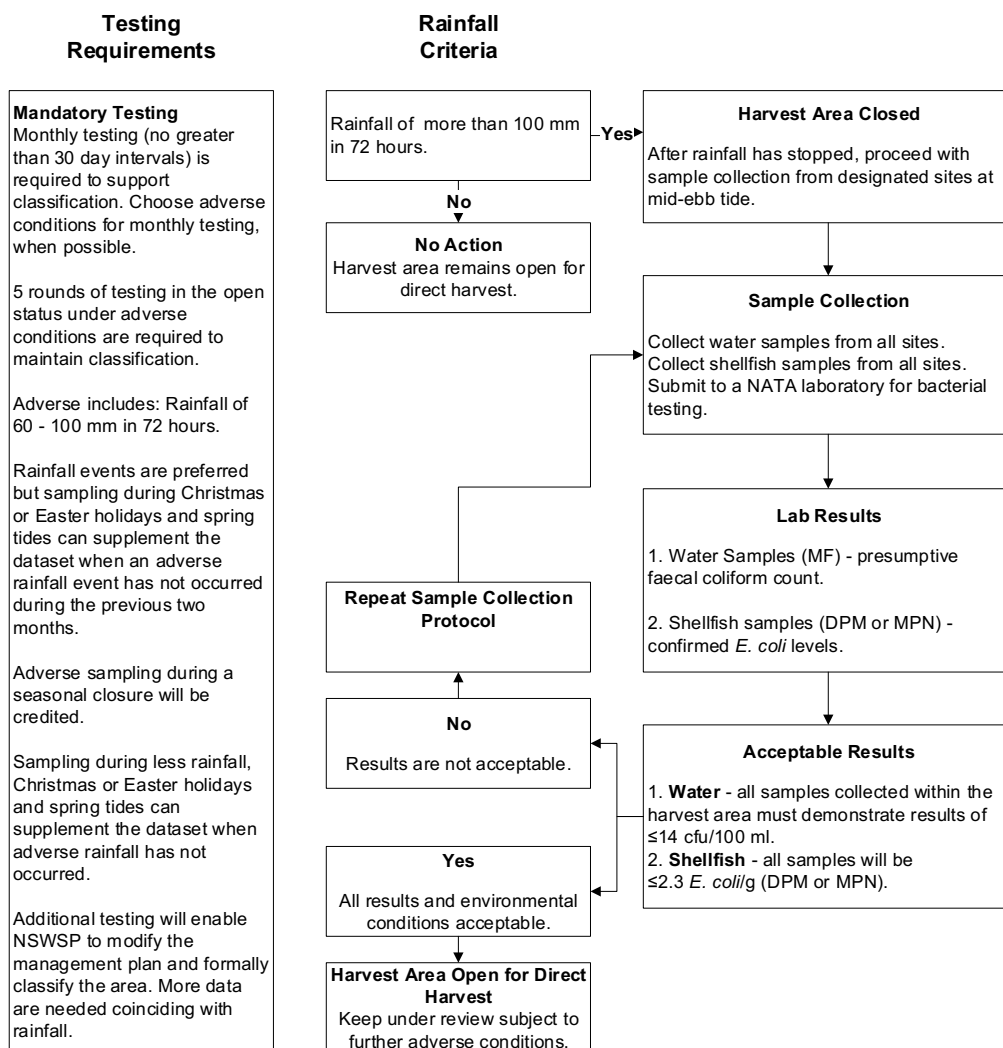
1. Rainfall is measured at BOM Vincentia rain gauge. BOM Jervis Bay Airfield is a reference gauge. Local rainfall observations can be used to close the harvest area.
2. It is the responsibility of farmers to ensure that the area is open prior to harvest.
3. Formal closure and reopening of the harvest area is the responsibility of the NSW Food Authority.
4. NSW Food Authority will enforce a local closure of the harvest area.
5. **Required water sites are 9, 10, 11, 12, 13, 14 and 15.**
6. **Required shellfish sites are 20 and 21. Biotoxin samples will be collected from the same shellfish sites.**
7. **Required phytoplankton sites are site 1P, 2P and 3P.**
8. The NSWSP and JBSP coordinator will liaise regarding environmental conditions and sampling arrangements.

Jervis Bay – Callala North and South Lease NSW Shellfish Program Management Plan 2020



October 2020

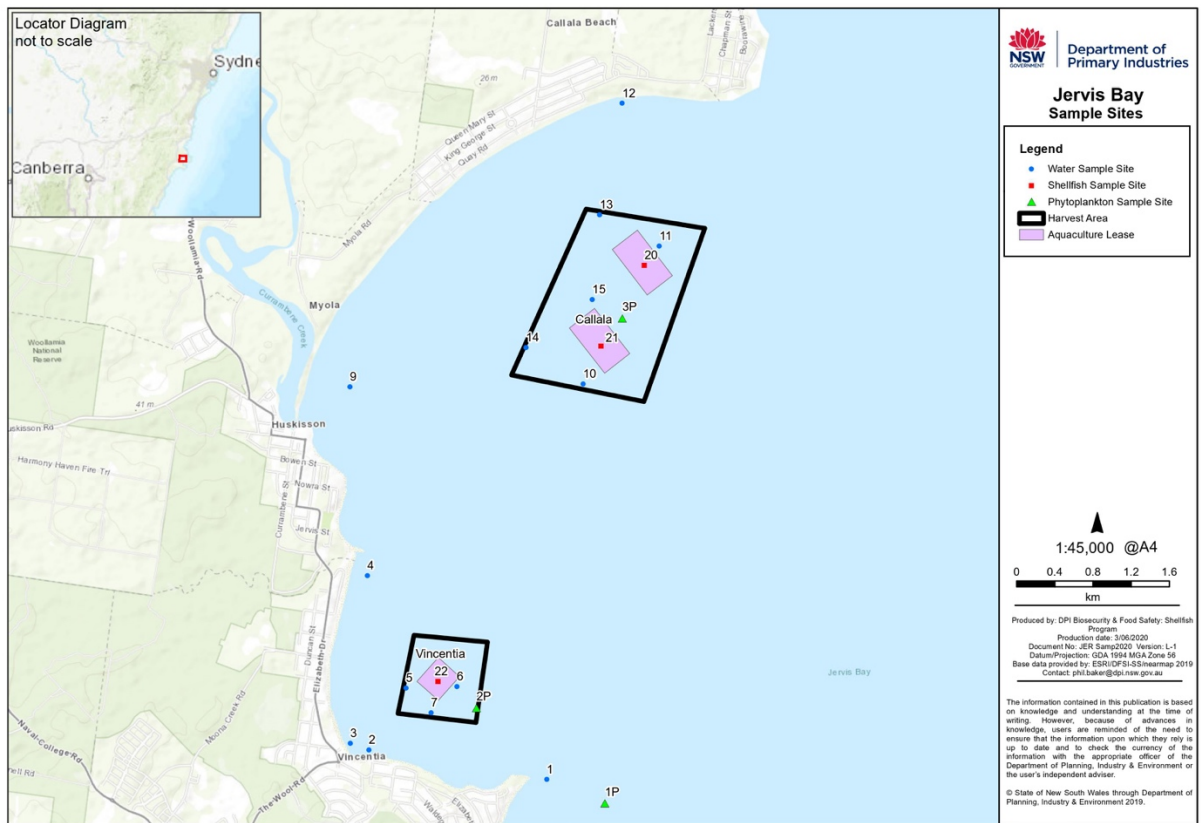
Vincentia Harvest Area  
**Provisionally Conditionally Approved**  
 Jervis Bay  
 Operation Under Rainfall Conditions



1. Rainfall is measured at BOM Vincentia rain gauge. BOM Jervis Bay Airfield is a reference gauge. Local rainfall observations can be used to close the harvest area
2. It is the responsibility of farmers to ensure that the area is open prior to harvest.
3. Formal closure and reopening of the harvest area is the responsibility of the NSW Food Authority.
4. NSW Food Authority will enforce a local closure of the harvest area.
5. **Required water sites are 1, 2, 3, 4, 5, 6 and 7.**
6. **Required shellfish site is 22 when activated. Biotoxin samples will be collected from the same shellfish site.**
7. **Required phytoplankton sites are site 1P, 2P and 3P.**
8. The NSWSP and JBSP coordinator will liaise regarding environmental conditions and sampling arrangements.

Jervis Bay – Vincentia Lease NSW Shellfish Program Management Plan 2020

Commercial Shellfish Aquaculture Leases, Jervis Bay, NSW – EMP.



NSW Shellfish Program – Jervis Bay Shellfish Program Water Quality Monitoring Sites 2020